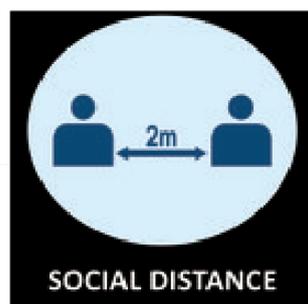


Prevention and Protection

against

COVID-19 and SARS-CoV-2 Virus



**A Publication by the OUSL COVID-19
Response Task Force**

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Preamble

As the whole world is challenged by the COVID-19 pandemic, we face the fresh challenge of an overload of information related to the virus and the disease. People are exposed to a huge amount of COVID-19 information daily and not all of it is reliable. Some of the information may be false and misleading hence potentially harmful. Spread of inaccurate information swiftly among the general public is a serious challenge that requires appropriate measures. Therefore, the availability of reliable and accurate facts, as well as health advice pertaining to the COVID-19 pandemic from a trusted source is a timely need.

As such, the subcommittee of the COVID-19 task force at The Open University of Sri Lanka (OUSL) has decided to prepare a detailed document as a reliable source of information about the COVID-19 virus and the conditions of the disease to enhance public awareness related to the COVID-19 pandemic. The document is developed based on the up-to-date information and guidelines provided by the World Health Organization (WHO). We hope this would be beneficial to the OUSL community in terms of knowledge and help minimize the spread of the virus among staff and the public.

Part 1 - What is COVID-19 ?

- **COVID-19 Infection**

COVID-19 is a viral infection. The disease is fatal and caused by a new coronavirus called the SARS-CoV-2. This fatal viral infection was first reported in Wuhan, People's Republic of China on 31 December 2019. The WHO first learned of this new virus following a report of a cluster of cases of 'viral pneumonia', a lung infection caused by a virus, in Wuhan, China. The estimated incubation period for COVID-19 is up to 14 days from the time of exposure, with a median incubation period of 4 to 5 days. The spectrum /continuum of illness can range from asymptomatic infection to severe pneumonia with acute respiratory distress syndrome and death.

- **Symptoms of the Disease**

The most common symptoms of COVID-19:

- Fever (High body temperature)
- Dry cough
- Fatigue (Tiredness)

The less common symptoms of COVID-19: these symptoms may affect some patients

- Loss of taste or smell
- Nasal congestion (nasal block)
- Conjunctivitis (eye infection also known as red eyes)
- Sore throat
- Headache
- Muscle or joint pain
- Different types of skin rash
- Nausea or vomiting
- Diarrhea
- Chills or dizziness (coldness with shivering or giddiness)

The most common symptoms of **severe** COVID-19 disease:

- Shortness of breath and difficulty in breathing
- Loss of appetite
- Confusion
- Persistent pain or pressure in the chest
- High temperature (above 38 °C).

Less common symptoms of **severe** COVID-19 disease:

these symptoms may affect some patients

- Irritability (Touchiness or bad temper)
- Confusion
- Reduced consciousness (sometimes associated with seizures),
- Anxiety
- Depression
- Sleep disorders
- More severe and rare neurological complications such as strokes, brain inflammation, delirium (restlessness and disorientation), and nerve damage.

How does the disease impact the human body?

The SARS-CoV-2 virus (COVID-19 virus) can enter the human body through mouth, nose or eyes. After the virus enters, it moves down through the respiratory tract, the air passage includes mouth, nose, and the throat up to the lungs. Then, the lungs might become inflamed, making it difficult to breath. This inflamed condition can lead to pneumonia, which is the infectious condition of the tiny air sacs (alveoli) inside the lungs where the blood exchanges oxygen and carbon dioxide. Therefore, this infection of the tiny air sacs in the lungs impede the gas exchange of the human body and causes an oxygen deficiency to the body and the affected person feeling a difficulty in breathing.

Complications of the disease (long term effects of COVID-19)

The SARS-CoV-2 virus (COVID-19 virus) can have severe complications, such as pneumonia affecting one or both lungs. In addition, the COVID-19 virus can also damage the heart, liver, kidneys, nervous system, brain, and digestive system. In some people, it will affect the blood and immune system as well. Therefore, COVID-19 can cause heart, renal, or multiple organ failure, resulting in death. However, some people are more at risk of severe complications than others.

Environmental factors required for the existence of the virus

Based on the recent scientific evidence, the COVID-19 virus can exist in all areas. Regardless of the climate, the virus can survive in hot and humid weather. No evidence to date about survival of the COVID-19 virus in water and sewage. The most probable environmental reservoirs for COVID-19 virus are bats but, the virus enters the human body from another intermediate animal host. These intermediate hosts could be a domestic food animal, a wild animal, or a domesticated wild animal which has yet to be identified. As recent studies highlighted, the COVID-19 virus can survive on different surfaces for different time durations. The virus can remain viable on plastic and stainless-steel surfaces for up to 72 hours while it remains viable up to four (04) hours on copper surfaces, and up to 24 hours on cardboard surfaces.

The seriousness of the virus (virulence of the virus)

The COVID-19 virus attacks the healthy cells of the human body and infect the body cells, especially the healthy cells, in the respiratory tract. The virus is more likely to go deeper along the air way than the other viruses like pneumonia. The virus invades the body and multiply itself at speed throughout the body affecting other organ systems as well. Therefore, unexpected complications may arise in different organ systems of the body other than the respiratory system.

Mode of Transmission of the COVID-19 Virus

SARS-CoV-2 virus (COVID-19 virus) transmits from one person to another by several different modes. The virus can mainly spread through exhalation from an infected person in the form of small particles of liquid with respiratory secretions or saliva propelled out during a cough, sneeze or speech. These small particles expelled from an infected person range from larger respiratory droplets to smaller aerosols. Current studies show that you may directly inhale or catch these droplets or aerosols to your eyes, mouth, or nose when you are in close proximity (within 1 meter) to an infected person who has respiratory symptoms, leading to infection. Though the larger droplets may rapidly settle down, smaller aerosols that include virus can remain suspended in the air much longer and may travel farther than a meter. Hence, COVID-19 virus can spread rapidly in poorly ventilated or overcrowded indoor areas where people spend longer periods of time.

The other way the COVID-19 virus can transmit is through contaminated surfaces. If someone touches those surfaces that have been contaminated by the virus and then touches their eyes, nose, or mouth without washing their hands, they could infect themselves.

The people who are at a higher risk for infection

Current evidence suggests that the people who are over 60 years of age, the people who are with concomitant medical problems such as high blood pressure, diabetes, kidney failures, heart diseases, lung diseases, cancer conditions and obesity are at a higher risk of contracting COVID-19 infection and escalating to critical conditions that require intensive care.

Part 2 - The important terminology related to COVID-19

Some technical terms which are relatively new to the general public is mostly used in the context of COVID-19. Having good understanding of the meanings of these terms is vital to better comprehension of the information about COVID-19 disease including its management, steps to be taken to minimize the risk, and the preventive measures to be followed by the public. Therefore, this section will introduce you to a few new terms that would help you to improve your awareness of the COVID-19 disease condition.

- Isolation
- Quarantine
- Transmission of the virus
- RAT test
- PCR test
- Disinfection and disinfectant
- Sanitization and sanitizer
- Asymptomatic cases and pre-symptomatic cases

Isolation:

The word isolation means being separated from others. This is a method used to prevent spread of any communicable disease. In managing the COVID-19 disease, isolation is used for people with COVID-19 symptoms or who have tested positive for the virus. If you have symptoms of COVID-19, you should remain in isolation for at least 10 days plus an additional 3 days without symptoms. If you are infected and do not develop symptoms, you should remain in isolation for 10 days from the time your test positive. If isolation in a hospital is not possible and you are not in a high-risk group of developing severe COVID-19 condition, isolation can take place at your home. However, during the period of isolation at home, you should not maintain any contact with your family members, or any others residing at your home. If you do undergo isolation at your home, it should be done under medical supervision.

Quarantine:

This is also a method of prevention of infections. Quarantine means that you remain separated from others because you have been exposed to the virus or to an infected person and hence

you may be infected. Quarantine is used for anyone who is a contact of someone infected with the SARS-CoV-2 virus, which causes COVID-19, whether the infected person has symptoms or not. For COVID-19 infection, quarantine can take place in a designated place or at home for 14 days.

Mode of transmission of the virus:

The word transmit means spread or move from one place to another. Transmission of virus means moving the virus from one place to another or spread the virus from a host to another. Understanding how the SARS-CoV-2 virus causes COVID-19 infection transmits/spreads from one person to another is very important to prevent the spread of COVID-19. The prevention of transmission is best achieved by identifying suspect cases as quickly as possible, testing, and isolating infectious cases. In addition, it is critical to identify all close contacts of infected people so that they can be quarantined to limit onward spread and break chains of transmission.

When do infected people transmit the virus?

Whether or not the infected people have symptoms, the infected people can be contagious, and the virus can spread from them to other people. Laboratory data suggests that infected people appear to be most infectious just before they develop symptoms (namely 2 days before they develop symptoms) and early in their illness. People who develop severe disease can be infectious for longer.

While someone who is infected but never develops symptoms can pass the virus to others, it is still not clear how frequently this occurs, and more research is needed in this area.

RAT (Rapid Antigen Test)

COVID-19 rapid antigen test is a diagnostic test performed for the detection of SARS-CoV-2 viral proteins (known as antigen) in human nasopharyngeal swab specimen. (The test is also known as rapid diagnostic test – RDT). The test results will be available within 15-20 minutes. Samples are collected from the nose and/or throat with a swab. These tests are cheaper than PCR and will offer results more quickly, although they are generally less accurate when compared to PCR test. The Rapid Antigen Test performs the best when more viruses circulate in the community and when sampled from an individual during the time

he/she is most infectious. However, it is advisable to follow the expert advice to decide which test should be done.

PCR (Polymerase Chain Reaction) test

PCR (Polymerase Chain Reaction) test is another diagnostic test used to detect SARS-CoV-2 virus and confirm the infection. This is the most commonly used molecular test. The test result is more accurate than in the RAT. Samples are collected from the nose and/or throat with a swab. The PCR test detects the virus in the sample by amplifying viral genetic material to detectable levels. For this reason, PCR test is used to confirm an active infection, usually within a few days of exposure and around the time that symptoms may begin.

When and to whom should these tests be done?

Anyone with symptoms should be tested, wherever possible. People who do not have symptoms but have had close contact with someone who is, or may be, infected may also be considered for testing.

While a person is waiting test results, he/she should remain isolated from others. This is a very important measure to be taken to prevent spread of infection. Where testing capacity is limited, tests should first be done for those at higher risk of infection, such as health workers, and those at higher risk of severe illness such as older people, especially those living in elderly care homes or those who are under long-term care with chronic illnesses such as diabetes, kidney diseases and chronic respiratory diseases.

Disinfection and disinfectant:

Disinfection is a process performed to destroy, kill, inactivate, or significantly reduce the concentration of germs (harmful agents) such as bacteria, viruses, and fungi. Disinfectant is a chemical substance that is used to disinfect (to kill harmful germs) especially on hard surfaces and in water. In disinfection, some stronger chemicals are used than in sanitizing objects or hands. Disinfection is not a common part of your cleaning routine. If so, when do you use disinfection in household environment? You need to disinfect things like toilets or sinks in your home that can come into contact with germs (harmful microorganisms like virus and bacteria). You will also want to disinfect high-touch areas like door-knobs and faucets.

However, it is noteworthy that overuse of disinfectants can lead to harmful health and environmental consequences.

Sanitization and sanitizers:

Sanitization is a process of cleaning certain surfaces or areas to lowering the number of germs on a surface to a safe level, so that it is made bacteria-free and elementally clean all types of microbes and viruses that can infect the human body and cause different kinds of diseases. Sanitization removes harmful microbes with the help of chemicals that do not harm the human body. The chemicals are used in measured quantities and diluted with water or other diluting agents to prepare sanitizers. The sanitizer is a substance, or a chemical fluid used to sanitize (clean/remove) germs on skin and objects. Sanitizing is generally a little gentler than disinfecting. Hand Sanitization is a process of cleaning the hands that can get infected with any contagious germs (microbes) when the hands touch any infected surfaces, animals, or humans.

As Center for Disease Control and Prevention (CDC) states, while sanitizing refers to lowering the number of germs to a safe level by cleaning, disinfecting itself refers to killing nearly 100 percent of germs on surfaces or objects. This works by using chemicals to kill germs. Disinfecting does not necessarily clean dirty surfaces, but it does kill germs, helping to lower the risk of infection.

It is best to sanitize surfaces that do not normally come into contact with dangerous bacteria, or those that are best cleaned without powerful chemicals. For example, your hands, cooking tools or children's toys would be best for sanitization, as you do not want those coming into contact with powerful chemicals

Asymptomatic cases and pre-symptomatic cases:

Both terms refer to people who do not have symptoms. The difference is that 'asymptomatic' refers to people who are infected but never develop any symptoms, while 'pre-symptomatic' refers to infected people who have not yet developed symptoms but go on to develop symptoms later.

Part 3 - Management of the disease

Management protocol is based on case severity and risk factors, irrespective of transmission scenario.

Case severity	Recommended management interventions
Mild and moderate disease condition with no risk factors	<p>Patient should be instructed to</p> <ul style="list-style-type: none"> • self-isolate and • contact COVID-19 information line for advice on testing and referral. <p>Test suspected COVID-19 cases according to diagnostic strategy.</p> <p>Isolation in:</p> <ul style="list-style-type: none"> • Hospitals/health care institutions, if resources allow • Designated Community Care Centers (e.g. hotels) with access to rapid health advice (i.e. adjacent COVID-19 designated health post/ telemedicine) <p>Self-isolation at home according to WHO guidelines.</p>
Moderate, severe, and critical disease condition with risk factors	<p>Patient should be instructed to self-isolate and call COVID-19 hotline for emergency referral as soon as possible.</p> <p>Hospitalization for isolation and inpatient treatment.</p> <p>Test suspect COVID-19 cases according to diagnostic strategy</p>

Home management of COVID-19 cases

Ideally, all patients with COVID-19 are cared for in a healthcare institution. However, there may be some circumstances where patients may not require hospitalization or inpatient care is unavailable or unsafe, such as when capacity is insufficient to meet the demand for healthcare services. Patients should be assessed on a case-by-case basis by the health professionals to determine whether their care needs can best be met while being managed in the home.

People with no symptoms should be able to stay at home, if adequately isolated from others, but this should be confirmed by a doctor. Those with mild or moderate disease can be considered for home care if they are under the age of 60, do not smoke, are not obese, and do not have other diseases such as cardiovascular disease, diabetes mellitus, chronic lung disease, cancer, chronic kidney disease or immune suppression.

The health professional, who most commonly be a doctor will assess risk factors along with the person's symptoms, medical history, and ability for the family to manage the care. Household members need to limit shared spaces, practice the recommended hygiene, and know how to recognize and respond to signs of worsening health.

A trained health professional will need to assess whether the home in question is suitable for the isolation and care of a COVID-19 patient. This assessment is based on the following three factors:

- Clinical condition of the COVID-19 patient (whether the condition is severe, moderate, or mild and the requirement of supportive care etc.)
- Evaluation of the home setting (availability of the required facilities as to whether proper infection prevention and control measures can put in place)
- The ability to monitor the clinical evolution of a person with COVID-19 at home.

Trained health professionals are also important to do periodical assessments for the patient and support family members in the home by phone, telemedicine, or outreach teams while patient is being cared by at home.

What should be done to prevent other people in the house from becoming sick if a person with COVID-19 is being cared for at home?

There are several precautions that can prevent the spread of COVID-19 to other people in the house:

- The patient should stay in a separate room. If this is not possible, then keep at least a 1-metre distance from them. The patient and anyone else in the same room should wear a surgical mask or a fabric mask which meet the standards.
- Provide good ventilation in the room of the patient and shared spaces, and open windows if possible and safe to do so.
- Use of fans for air circulation should be **avoided** if possible unless it is in a single occupancy room when there are no other individuals present. If the use of fans is unavoidable, increase outdoor air exchange by opening windows and minimize air blowing from one person directly to another.
- If heating, ventilation, and air-conditioning (HVAC) systems are used, they should be regularly inspected, maintained, and cleaned. Rigorous standards for installation and

maintenance of ventilation systems are essential to ensure that they are effective and contribute to a safe environment

- The patient should wear a surgical mask as much as possible, when not alone in the room and when at least a 1-metre distance from others cannot be maintained.
- Visitors should not be allowed in the home.
- Limit the number of caregivers to one person with no underlying conditions, if possible.
- Caregivers and household members should wear a surgical mask while in the same room with a patient, not touch their mask or face during use, discard the mask after leaving the room, and wash their hands afterward.
- The patient should have separated dishes, cups, eating utensils, towels, and bed linens. They should be washed with soap and water, and not shared.
- Frequently touched surfaces by the patient should be cleaned and disinfected at least daily.
- Everyone in the household should wash their hands with soap and water regularly, especially:
 - after coughing or sneezing
 - before during and after you prepare food
 - before eating
 - after using the toilet
 - before and after caring for the ill person
 - when hands are visibly dirty
- A cough or sneeze should be covered with a flexed elbow or a disposable tissue that is discarded immediately after use.
- The waste from the patient should be packed in strong closed bags before disposal.
-

How long should people with COVID-19 stay at home and in isolation?

People with COVID-19 who are cared for at home should stay in isolation until they are no longer able to transmit the virus to others:

- Those with symptoms should stay isolated for a minimum of 10 days after the first day they developed symptoms, plus another 3 days after the end of symptoms – when they are without fever and without respiratory symptoms.
- People without symptoms should stay isolated for a minimum of 10 days after testing positive.

Lab testes to be undertaken to identify the COVID-19 disease and when these tests to be done

As discussed in a previous section of this text, the Rapid Antigen Test (RAT) and Polymerase Chain Reaction (PCR) test are the widely used test types to detect COVID-19 infection. The RAT is performed to detect the protein fragments specific to the Coronavirus. This test can be done in a clinic, or in the outpatient department (OPD) of designated public sector hospital or in private sector hospitals. Turnaround time for results is usually very quick and, in some cases, results can be reported within 15 minutes. However, the RAT is sensitive enough to detect the disease when the viral load is high in the infected person so that the test will miss the infected persons with low viral load in the body. Therefore, the results of RAT may not always be accurate.

PCR test is considered the “Gold standard” in SARS-CoV-2 detection. This test detects the genetic material specific to the SARS-CoV-2 virus and even with those who have no symptoms. Therefore, the result is more accurate than that of RAT. Turnaround time for results is longer than in RAT and generally in the 2-3 days range.

Part 4 - Precautions/preventive measures to be taken by the public to stop the spread of infection

There are variety of measures you can follow to reduce your risk of getting COVID-19 infection and to protect your loved ones as well from this deadly infection. While adapting to new normalcy, follow the precautions mentioned below to lower your risk and others as well.

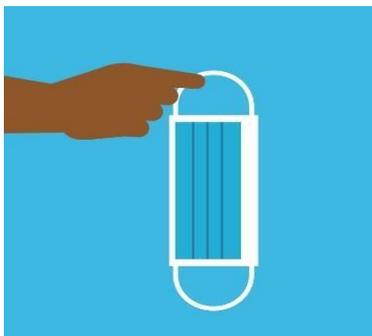
- Wear face masks
- Follow the methodical hand washing technique
- Use of sanitizers as necessary
- Maintain the recommended physical distance
- Get vaccinated
- Use disinfectants when necessary
- Avoid 3 Cs (Crowded places, Close-contact settings, Confined and enclosed spaces)

Wearing a face mask:

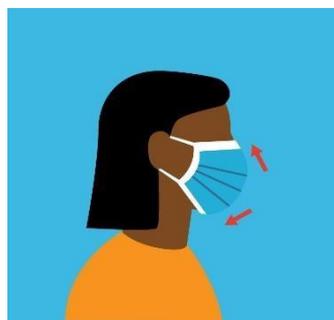
As the SARS-CoV-2 virus transmit from infected person's nose and mouth in droplets and aerosols (as discussed under "mode of transmission" in this text), wearing a face mask is a potential measure to break the chain of transmission of the virus. It is a key measure to suppress transmission and save lives. Therefore, it is of paramount importance to make wearing a mask a normal part of being around other people. The use of a mask alone is not enough to have adequate level of protection against the COBVID-19. Mask should be worn as a part of comprehensive safety measures which will be discussed in the later part of this section. The appropriate use, storage and cleaning or disposal of masks is essential to make them as effective as possible. Depending on the type, masks can be used for either protection of healthy persons or to prevent onward transmission.

How to wear and handle a mask correctly?

- Clean your hands before you put your mask on, as well as before and after you take it off
- Clean your hands after you touch the mask on your face at any time.
- Make sure it covers your nose, mouth, and chin.
- When you take off a mask, if it is a surgical mask, store it in a clean plastic bag, and dispose in a trash bin. If it is a fabric mask, wash it every day.
- Do not use masks with valves.
- While wearing a mask, you should still keep physical distance from others as much as possible. Wearing a mask does not mean you can have close contact with people.



Touch only the bands or ties when putting on and taking off your mask.



Make sure the mask fits to cover your nose, mouth and chin. If you adjust the mask to cover those areas, wash your hands before and after.



Make sure you can breathe and talk comfortably through your mask

How NOT to wear a mask



On your arm



Around your neck



On your forehead



Under your nose



Only on your nose



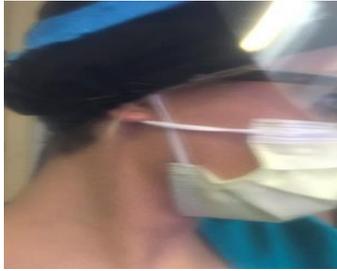
On your chin



Dangling from one ear



Do not put on children younger than two Years old



Do not cross the ear loops as it will widen the gap at the sides

According to the WHO guideline, surgical masks are recommended for following groups:

- Health workers in clinical settings.
- Anyone who is feeling unwell, including people with mild symptoms, such as muscle aches, slight cough, sore throat, or fatigue.
- Anyone awaiting COVID-19 test results or who has tested positive.
- People caring for someone who is a suspected or confirmed case of COVID-19 outside of health care institutions.

Surgical masks are also recommended for the following groups, because they are at a higher risk of becoming seriously ill with COVID-19 and dying:

- People aged 60 or over.
- People of any age with underlying health conditions, including chronic respiratory disease, cardiovascular disease, cancer, obesity, immuno-compromised patients and diabetes mellitus.

Important tips about wearing masks

- ❖ **Non-surgical, fabric masks** can be used by the general public under the age of 60 and who do not have underlying health conditions.
- ❖ In areas where the virus is circulating, masks should be worn:
 - when you are in crowded settings,
 - where you cannot be at least 1 meter from others, and in rooms with poor or unknown ventilation.

- ❖ It is not always easy to determine the quality of ventilation, which depends on the rate of air change, recirculation, and outdoor fresh air. So, if you have any doubts, it is safer to simply wear a mask.
- ❖ For indoor public settings such as busy shopping centers, religious buildings, restaurants, schools, and public transport, you should wear a mask if you cannot maintain physical distance from others.
- ❖ If a visitor comes to your home who is not a member of the household, wear a mask if you cannot maintain a physical distance or the ventilation is poor.
- ❖ When you are outside, wear a mask if you cannot maintain physical distance from others. Some examples are busy markets, crowded streets, and bus stops.
- ❖ The prolonged use of surgical masks when properly worn, DOES NOT cause CO₂ intoxication nor oxygen deficiency

Should I wear a mask while exercising?

Even when you are in an area of COVID-19 transmission, masks should not be worn during vigorous physical activity because of the risk of reducing your breathing capacity. No matter how intensely you exercise, keep at least 1 meter away from others, and if you are indoors, make sure there is adequate ventilation.

How should I choose what fabric mask to buy or ideally fit and fabrics if I make my own?

Check for filtration, breathability and fitness when choosing a fabric mask. It should be held in place comfortably with little adjustment using elastic bands or ties. There are different mask shapes such as flat-fold or duckbill. Find the one that fits closely over your nose, cheeks, and chin. When the edges of the mask are not close to the face when speaking, air can penetrate through the edges of the mask rather than being filtered through the fabric. Masks with vents or exhalation valves are not advised because they allow unfiltered breath to escape the mask.

How do you identify a best fabric mask to use?

The standardized fabric mask should be in 3 layers: inner layer, middle layer, and outer layer

- **Inner layer:** which comes into direct contact with your face. This should be a hydrophilic which means able to easily absorb droplets from your exhaled breath. The material should be cotton and light color such as white which can help to determine when it is soiled or wet.
- **Middle layer:** this act as a filter. The ideal material for this layer is polypropylene fabric which is a non-absorbent material
- **The outer layer:** should be in a hydrophobic material which means that the fabric will repel droplets and moisture. This can be made of a synthetic material such as polyester or polyester cotton blend

If purchasing a fabric mask, check to make sure it meets national performance standards specified above.

How should I wear and clean a fabric mask?

Put on and wear a fabric mask:

- Before touching the mask, clean your hands with an alcohol-based hand rub or soap and water.
- Inspect the mask for tears or holes; do not use a mask that is damaged.
- Adjust the mask to cover your mouth, nose, and chin, leaving no gaps on the sides.
- Place the straps behind your head or ears. Do not cross the straps because this can cause gaps on the side of your face.
- Avoid touching the mask while wearing it. If you touch it, clean your hands.
- Change your mask if it gets dirty or wet.

How to take off and store a fabric mask?

- Clean your hands before taking off the mask.
- Take off the mask by removing it from the ear loops, without touching the front of the mask.
- If your fabric mask is not dirty or wet and you plan to reuse it, put it in a clean plastic, resealable bag. If you need to use it again, hold the mask at the elastic loops when removing it from the bag. Clean your mask once a day.

- Clean your hands after removing the mask.

How to clean a fabric mask?

- Wash fabric masks in soap or detergent and preferably hot water (at least 60 degrees Centigrade/140 degrees Fahrenheit) at least once a day.
- If it is not possible to wash the mask in hot water, then wash it in soap/detergent and room temperature water, followed by boiling the mask for 1 minute.

General tips:

- Make sure to clean your hands before touching your mask.
- Make sure you have your own mask and do not share it with others.
- Resist the temptation/urge to pull down your mask to your chin or take it off when speaking to other people.
- Do not store your mask around your arm or wrist or pull it down to rest around your chin or neck. Instead, store it in a clean plastic bag.

How to put on, wear, and take off a surgical mask?

Putting on a surgical mask:

- Before touching the mask, clean your hands with an alcohol-based hand rub or soap and water.
- Inspect the mask for tears or holes; do not use a mask that has previously been worn or is damaged.
- Verify which side is the top – this is usually where the metal strip is.
- Then, identify the inside of the mask, which is usually the white side.
- Place the mask on your face covering your nose, mouth, and chin, making sure that there are no gaps between your face and the mask. Place the straps behind your head or ears. Do not cross the straps because this can cause gaps on the side of the mask.
- Pinch the metal strip so it molds to the shape of your nose.
- Remember, do not touch the front of the mask while using it to avoid contamination; if you accidentally touch it, and clean your hands.

Take off a surgical mask:

- Before touching the mask, clean your hands with an alcohol-based hand rub or soap and water.
- Remove the straps from behind the head or ears, without touching the front of the mask.
- As you remove the mask, lean forward, and pull the mask away from your face.
- Medical masks are for single use only; discard the mask immediately, preferably into a closed bin.
- Clean your hands after touching the mask.
- Be aware of the condition of the mask; replace it sooner next time if it has got soiled or damp.

What is the difference between surgical (medical) masks and respirators like N95s?

Surgical masks (also known as medical masks) are:

- composed of 3 layers of synthetic nonwoven materials
- configured to have filtration layers sandwiched in the middle
- available in different thicknesses
- have various levels of fluid-resistance and filtration

Respirators (also known as filtering facepiece respirators – FFP) are available at different performance levels such as FFP2, FFP3, N95, N99.

Surgical masks and respirator masks are similar in their protection value. However, respirators are specific for certain procedures and instances because they have a tightly fitted component to them. Respirator masks are designed to protect healthcare workers who provide care to COVID-19 patients in settings and areas where aerosol generating procedures are undertaken. Healthcare workers should be fit tested before using a respirator to ensure that they are wearing the correct size. Wearing a loose-fitting respirator will not offer the same protection to the wearer and may allow small particles to get inside the mask through the sides.

Wearing a mask with exhalation, mask like KN95 with a valve

World Health Organization (WHO) **does not advise** using masks or respirators with exhalation valves. These masks are intended for industrial workers to prevent dust and

particles from being breathed in as the valve closes on inhalation. However, the valve opens on exhalation, making it easier to breathe but also allowing any virus to pass through the valve opening. This makes the mask ineffective at preventing the spread of COVID-19 or any other respiratory virus.

Using gloves to prevent spread of COVID-19

WHO **does not advise** using gloves by people in a community. Instead, WHO encourages the installation of public hand hygiene stations at the entrance and exit of public places, such as supermarkets or public/private buildings. This helps reduce germs brought in by people's hands. By widely improving hand hygiene practices, we can help prevent the spread of the COVID-19 virus and other infections.

Following the methodical hand washing technique

Hand washing is an action of performing hand hygiene for the purpose of physically or mechanically removing dirt, organic material, and/or microorganisms. Washing hands with plain or antimicrobial soap and water is the widely used method to maintain hand hygiene. **Hands are the primary carriers of dirt, viruses, and bacteria**, as they can come into contact with so many different surfaces throughout the day. Therefore, the importance of hand washing cannot be understated. If you do not follow the correct hand washing procedure, especially in the COVID-19 context, it could easily lead to the transmission of the virus from surfaces via your hands to yourself and others to get infected. As WHO recommends, there are 7 steps to follow in the methodical hand washing technique.

The 7 Steps of Hand Washing

These 7 hand washing steps, as advised by the WHO, are effective and straightforward for thorough cleaning. The recommended hand washing time is at least 20 seconds, so make sure you complete all the steps and do not rush through them.

Step 1: Wet Hands

Wet your hands and apply enough liquid soap to create a good lather. The temperature of the water should be between 35°C and 45°C.



Step 2: Rub Palms Together

Rub your hands palm to palm in circular motions. Rotate clockwise and anticlockwise.



Step 3: Rub the Back of Hands

With your fingers linked through the other hand, use your right palm to rub the back of your left hand. Then swap the hands and repeat.



Step 4: Interlink Your Fingers

Link your fingers together, facing each other, into clasped hands. Then rub your palms and fingers together.



Step 5: Cup Your Fingers

Cup your fingers together, with your right hand over and your left hand under. With your fingers interlocked, rub the backs of them against your palms. Then swap the hands and repeat.



Step 6: Clean the Thumbs

Enclose your right hand around your left thumb and rub as you rotate it. Then swap the hands and repeat.



Step 7: Rub Palms with Your Fingers

Rub your fingers over your left palm in a circular motion. Then swap the hands and repeat.



Once you have followed these hand washing steps, you should then **thoroughly rinse** with warm running water and **dry with a clean, disposable paper towel**. Paper towels are the most hygienic way to dry your hands, but automatic hand dryers may also be used in your workplace. If so, make sure you do not touch any part of the hand dryer with your clean hands. Likewise, you should never use a reusable towel to dry your hands, as they can harbour dangerous levels of microbes that can transfer back onto your hands.

If your water taps have a push and release or automatic feature, use this as instructed. If not, you should use a disposable paper towel to turn off the tap.

Use of sanitizers as necessary

It has already been discussed about the process of sanitization in the previous section of this text under “Terminology”. In this section, it intended to present some important points about the use of sanitizers for hand hygiene.

- As WHO recommends, alcohol-based sanitizers are safe for everyone to use. Alcohol in the sanitizers has not been shown to create any relevant health issues. Little alcohol is absorbed into the skin, and most products contain an emollient (soothing agent with moisturizing effect) to reduce skin dryness. Allergic contact dermatitis and bleaching of back hand hair due to alcohol are very rare adverse effects. Accidental swallowing and intoxication have been reported in rare cases.
- An alcohol-based sanitizer does not create antibiotic resistance. Unlike other antiseptics and antibiotics, pathogens (harmful germs) do not seem to develop resistance to alcohol-based sanitizers.

- Wearing gloves risks transferring germs from one surface to another and contaminating your hands when removing them. **Wearing gloves does not replace cleaning hands.** Health workers wear gloves only for specific tasks
- Apply a palmful of alcohol-based sanitizer to cover all surfaces of your hands. Rub your hands together until palms are dry. The entire procedure should last for 20-30 seconds.
- When you sanitize your hands with an alcohol based sanitizer, rub hands until you feel completely dry before performing any activities that may involve heat, sparks, static electricity, or open flames. Keep containers of sanitizers away from flame and heat as it is flammable
- Use an alcohol-based hand sanitizer that contains **at least 60% alcohol**. Supervise young children when they use hand sanitizer to prevent swallowing alcohol, especially in schools and childcare facilities.
- **Do NOT** rinse or wipe off the hand sanitizer before it is dry; it may not work well against germs.
- There are important differences between washing hands with soap and water and using hand sanitizer. Soap and water work to remove all types of germs from hands, while sanitizer acts by killing certain germs on the skin. Although alcohol-based hand sanitizers can quickly reduce the number of germs in many situations, they come second to hand washing. Soap and water are more effective than hand sanitizers at removing certain kinds of germs.
- Hand sanitizers also may not remove harmful chemicals, such as pesticides and heavy metals like lead.
- Hand washing reduces the amounts of all types of germs, pesticides, and metals on hands. Knowing when to clean your hands and which method to use will give you the best chance of preventing sickness.

- Be especially careful not to get hand sanitizer in your eyes because it can cause burning and damage the surface of the eye. Watch young children around dispensers containing hand sanitizer, which are often mounted at eye level and can splash.
- If you get hand sanitizer in your eyes, rinse your eyes thoroughly with water as soon as possible, and call a doctor or a health care provider to get proper advice.
- If you are using hand sanitizer in a closed area, such as a car, open the windows to improve ventilation until the hand sanitizer is dry.
- **DO NOT** use hand sanitizer if your hands are visibly dirty or greasy—for example, after gardening, playing outdoors, fishing, or camping. If a hand washing station is available, wash your hands with soap and water instead.

Use of Disinfectant when necessary

Disinfection practices are important to reduce the potential for COVID-19 virus contamination especially in non-healthcare settings, such as in the home, office, schools, universities, gyms, publicly accessible buildings, markets, transportation and business settings or restaurants. **High-touch surfaces** in these non-health care settings should be identified for priority disinfection. Such high-touch surfaces may include door and window handles, kitchen and food preparation areas, counter tops, bathroom surfaces, toilets and taps, touch-screen personal devices, personal computer keyboards, work surfaces, and handrails in public vehicles (buses, vans and three wheelers) etc.

Which surface disinfectants are effective Against COVID-19 in non-health care organizations?

In non-health care settings, sodium hypochlorite (bleach / chlorine) may be used at a recommended concentration of 0.1% or 1,000ppm (1 part of 5% strength household bleach to 49 parts of water). Alcohol at 70-90% can also be used for surface disinfection. Surfaces must be cleaned with water and soap or a detergent first to remove dirt, followed by disinfection. Cleaning should always start from the least soiled (cleanest) area to the most soiled (dirtiest) area to not spread the dirt to areas that are less soiled.

All disinfectant solutions should be stored in opaque containers, in a well-ventilated, covered area that is not exposed to direct sunlight and ideally should be freshly prepared every day.

For indoor spaces, routine application of disinfectants to surfaces via **spraying** is **not recommended** for COVID-19. If disinfectants are to be applied, these should be via a cloth or wipe which is soaked in the disinfectant.

What protection measures should you take when using disinfectants?

It is important to reduce your risk when using disinfectants by following safety measures,

- The disinfectant and its concentration should be carefully selected to avoid damaging surfaces and to avoid or minimize toxic effects on household members (or users of public spaces).
- Avoid combining disinfectants, such as bleach and ammonia, since mixtures can cause respiratory irritation and release potentially fatal gases.
- Keep children, pets, and other people away during the application of the product until it is dry and there is no odour.
- Open windows and use fans to ventilate. Step away from odours if they become too strong. Disinfectant solutions should always be prepared in well-ventilated areas.
- Wash your hands after using any disinfectant, including surface wipes.
- Keep lids tightly closed when not in use. Spills and accidents are more likely to happen when containers are open.
- Do not allow children to use disinfectant wipes. Keep cleaning fluids and disinfectants out of the reach of children and pets.
- Throw away disposable items like gloves and masks if they are used during cleaning. do not clean and re-use.
- Do not use disinfectant wipes to clean hands or as baby wipes.
- The minimum recommended personal protective equipment when disinfecting in non-health care settings is rubber gloves, waterproof aprons, and closed shoes. Eye protection and surgical masks may also be needed to protect against chemicals in use or if there is a risk of splashing.
- Where cleaning and disinfection are not possible on a regular basis due to resource limitations, frequent hand washing and avoiding touching the face should be the primary prevention approaches to reduce any potential transmission associated with surface contamination.

Maintaining the recommended physical distance

In the context of COVID-19, physical distancing is referred to various methods used to reduce the contacts between people who carry the virus and those who have not yet been exposed to an infected person. Physical distancing is also known as social distancing or spatial distancing. It is an important part of preventive measures to control covid-19 infection. Maintaining a designated physical distance is an important precaution to control the spread of disease especially in the absence of treatments and vaccines at a satisfactory level. WHO sponsored study found that physical distancing saves the lives by two ways: both directly from breaking the chain of transmission and indirectly from reduction in air pollution during the period of physical distancing.

As many studies conducted in the context of COVID-19 found that the droplets emit in exhaled air from infected persons' mouth or nose spread through air up to a 1-meter distance (already discussed under "mode of transmission"), if you stay within a one-meter distance from an infected person, you may inhale virus containing droplets causing infection. A systematic review commissioned by WHO also has attempted to analyze physical distancing measures in relation to Corona virus transmission. Physical distancing of <1 m was reported to result in a transmission risk of 12.8%, compared with 2.6% at distances ≥ 1 m, supporting the physical distancing rule of 1 m or more. Therefore, WHO highly recommends maintaining **a minimum of one-meter distance in between people** as a one primary safety measure of preventing the spread of SARS-CoV-2 virus.

Getting vaccinated

Vaccines save people's lives working in the body by training and preparing the natural defense mechanism, the immune system, of the body to recognize and fight against the viruses and bacteria they target. After vaccination, if the body is later exposed to those disease-causing germs, it has enough strength (immunity developed by vaccines) to immediately destroy the germs, preventing illness.

There are several safe and effective vaccines that prevent people from getting seriously ill or dying from COVID-19. This is one part of managing COVID-19, in addition to the main

preventive measures of staying at least 1 meter away from others, covering a cough or sneeze with your elbow, frequently cleaning your hands, wearing a mask, and avoiding poorly ventilated rooms or spaces.

As of 3 June 2021, WHO has evaluated that the following vaccines against COVID-19 have met the necessary criteria for safety and efficacy. These vaccines are used in different countries.

- AstraZeneca/Oxford vaccine
- Johnson and Johnson
- Moderna
- Pfizer/BioNTech
- Sinopharm
- Sinovac
- Sputnik V

In Sri Lanka, we mostly used AstraZeneca/Oxford vaccine, and Sinopharm. Please consider the following points and adhere with them to gain your safety from vaccines against COVID- 19 infection.

- Take whatever vaccine is made available to you first, even if you have already had COVID-19.
- Approved COVID-19 vaccines provide a high degree of protection against getting seriously ill and dying from the disease, although no vaccine is 100% protective.
- It is important to be vaccinated as soon as possible once it is your turn and not wait.

Who should get vaccinated?

- As the World Health Organization (WHO) recommended, most people above 18 years and older are eligible to get the vaccine against COVID-19. WHO further describe that many people with pre-existing disease conditions of any kind including hypertension (high blood pressure), diabetes, asthma, liver, and kidney disease, as well as chronic infections that are managed and controlled with medical treatment are also eligible to get vaccinated against COVID-19 infection. Getting vaccinated against COVID-19 is mostly recommended for the people with above specified disease conditions as they

are more vulnerable for many infections than those who do not have such disease conditions.

- ❖ However, it is recommended to discuss with the doctor or your health care professional before you get the vaccine and follow their guidance if you:
 - have any of the above specified disease conditions
 - have a compromised (weaken) immune system or if you are taking any immunosuppressive medicine
 - are pregnant (if you are already breastfeeding, you should continue after vaccination)
 - have a history of severe allergies, particularly to a vaccine or any of the medicine or food kind
 - are severely frail (weak)

Children should not be vaccinated for the moment.

In the many countries of the world, there is not enough evidence yet on the use of vaccines against COVID-19 in children to make recommendations for children to be vaccinated against COVID-19. Children and adolescents tend to have milder disease compared to adults. However, children should continue to have the recommended childhood vaccines (**not the vaccine against the COVID-19**). But, according to the recent scientific evidence, in the United States, COVID-19 vaccine is recommended for children above 12 years.

What should you do and expect after getting vaccinated?

- Stay at the place where you get vaccinated for at least **15 minutes** afterwards, just in case you have an unusual reaction, so health workers can help you.
- Check when you should come in for a second dose if you are to get the first dose. Most of the vaccines available are two-dose vaccines. Check with your care provider whether you need to get a second dose and when you should get it. Second doses help boost the immune response and strengthen immunity.
- In most cases, minor side effects are normal. Common side effects after vaccination, which indicate that a person's body is building protection to COVID-19 infection include:
 - Arm soreness

- Mild fever
 - Tiredness
 - Headaches
 - Muscle or joint aches
- Contact your health care professional (doctor, community health nurse, Public Health Inspector) if there is redness or tenderness (pain) where you got the shot that increases after 24 hours, or if side effects do not go away after a few days.
 - If you experience an immediate severe allergic reaction to a first dose of the COVID-19 vaccine, you should not receive additional doses (second dose) of the vaccine. It is extremely rare for severe adverse health reactions to be directly caused by vaccines.
 - Taking **painkillers** such as paracetamol **before receiving** the COVID-19 vaccine to prevent side effects is **not recommended**. This is because it is not known the way painkillers may affect how well the vaccine works. However, you may take paracetamol or other painkillers if you do develop side effects such as pain, fever, headache, or muscle aches after vaccination.
 - **Even after you are vaccinated, keep taking precautions (safety measures) as you may still be a carrier of the virus though you are not getting infected.**

While COVID-19 vaccine will prevent serious illness and death, we still do not know the extent to which it keeps you from being infected and passing the virus on to others. **The more we allow the virus to spread, the more opportunity the virus has to change.**

Avoid 3 Cs (Crowded places, Close-contact settings, Confined and enclosed spaces)

There are certain places where COVID-19 can easily spread. If you stay in such places, you have a higher risk of getting infected by the virus. According to the WHO, these three places indicated from 3 Cs are:

- Crowded places with many people near by
- Close contact settings especially where people have close-range conversations

- Confined and enclosed places with poor ventilation

The World Health Organization highly recommends avoiding the three Cs in order to stop the spread of virus and keep you safe and healthy.

Part 5 - Misconceptions among people regarding Covid-19

Some people in the society do have certain misconceptions about COVID-19 infection and SARS-CoV-2 virus. They do strongly believe this false information without any scientific basis and proved scientific evidence. Having such mythical ideologies about diseases may lead people to experience undue detrimental health effects. Therefore, in this section, it is intended to present some scientifically proven facts declared by WHO regarding COVID-19 infection and SARS-CoV-2 virus. It will help those people who have misconceptions to abstain from them and take correct precautions thereby minimizing the spread of COVID-19 infection in the community.

Does COVID-19 transmit through houseflies?

To date, there is no evidence or information to suggest that the COVID-19 virus is transmitted through houseflies. The virus that causes COVID-19 spreads primarily through droplets generated when an infected person coughs, sneezes or speaks (this has already been discussed in a previous section of this text)

Does your body protect from COVID-19 by exposing yourself to the sun or temperature higher than 25^o C?

No, you cannot protect yourself from COVID-19 by exposing to the sun or a higher temperature. You can catch COVID-19, no matter how sunny or hot the weather is. Countries with hot weather have reported cases of COVID-19.

Can COVID-19 virus spread through mosquito bites?

To date there has been neither information nor evidence to suggest that the new coronavirus could be transmitted by mosquitoes. The new coronavirus is a respiratory virus which spreads

primarily through droplets generated when an infected person coughs or sneezes, or through droplets of saliva or discharging from the nose.

Can ultra-violet (UV) lamps use to disinfect hands or other areas of the skin?

No, UV lamps should not be used to disinfect hands or other areas of the skin because, UV radiation can cause skin irritation and damage your eyes.

Do vaccines against pneumonia provide the protection against COVID-19?

Vaccines against pneumonia, such as pneumococcal vaccine and Haemophilus influenza type B (Hib) vaccine, do not provide protection against the new coronavirus. The virus is so new and different that it needs its own vaccine.

Can antibiotics prevent or treat COVID-19?

Antibiotics work only against bacteria, not viruses. COVID-19 is caused by a virus, and therefore antibiotics should not be used for prevention or treatment of COVID-19. However, if you are hospitalized for COVID-19, you may receive antibiotics because bacterial co- infection is possible.

Does water or swimming transmit the COVID-19 virus?

The COVID-19 virus does not transmit through water while swimming. However, the virus spreads between people when someone has close contact with an infected person.

Does the prolonged use of surgical masks when properly worn, cause CO2 intoxication or oxygen deficiency?

The prolonged use of surgical masks when properly worn **does not** cause CO2 intoxication or oxygen deficiency. The prolonged use of surgical masks can be uncomfortable. While wearing a surgical mask, make sure it fits properly and that it is tight enough to allow you to breathe normally. **Do not re-use** a disposable mask and always change it as soon as it gets damp.

Can vitamin and mineral supplements cure COVID-19?

Micronutrients, such as vitamins D, C, and zinc, are critical for a well-functioning immune system and play a vital role in promoting health and nutritional well-being. There is currently no guidance on the use of micronutrient supplements as a treatment of COVID-19.

Part 6 - Some important facts for people to know and practice in the daily routine especially in the context of COVID-19

- Being able to hold your breath for 10 seconds or more without coughing or feeling discomfort DOES NOT mean you are free from COVID-19
-
- The likelihood of shoes spreading COVID-19 is very low
- Drinking alcohol does not protect you against COVID-19 and can be dangerous. The harmful use of alcohol increases your risk of health problems.
- Drinking methanol, ethanol or bleach DOES NOT prevent or cure COVID-19 and can be extremely dangerous and can lead to disability and death. Methanol, ethanol, and bleach are sometimes used in cleaning products to kill the virus on surfaces – however you should never drink them. They will not kill the virus in your body, and they will harm your internal organs.
- To protect yourself against COVID-19, disinfect the objects and surfaces, especially the ones you touch regularly. You can use diluted bleach or alcohol for that. Make sure you clean your hands frequently and thoroughly and avoid touching your eyes, mouth, and nose.
- Cold weather and snow CANNOT kill the COVID-19 virus. There is no reason to believe that cold weather can kill the new coronavirus or other diseases. The normal human body temperature remains around 36.5°C to 37°C, regardless of the external temperature or weather. The most effective way to protect yourself against the new coronavirus is by frequently cleaning your hands with alcohol-based hand rub or washing them with soap and water.
- Rinsing your nose with saline does NOT prevent COVID-19. There is no evidence that regularly rinsing the nose with saline has protected people from infection with the new coronavirus. There is some limited evidence that regularly rinsing the nose with saline

can help people recover more quickly from the common cold. However, regularly rinsing the nose has not been shown to prevent respiratory infections.

- Adding pepper to your soup or other meals DOES NOT prevent or cure COVID-19. Hot peppers in your food, though very tasty, cannot prevent or cure COVID-19. The best way to protect yourself against the new coronavirus is to keep at least 1 meter away from others and to wash your hands frequently and thoroughly. It is also beneficial for your general health to maintain a balanced diet, stay well hydrated, exercise regularly and sleep well.
- Eating garlic does NOT prevent COVID-19. Garlic is a healthy food that may have some antimicrobial properties. However, there is no evidence from the current outbreak that eating garlic has protected people from the new coronavirus.
- Taking a hot bath does not prevent COVID-19. Your normal body temperature remains around 36.5°C to 37°C, regardless of the temperature of your bath or shower. Taking a hot bath with extremely hot water can actually be harmful, as it can burn you.
- The current outbreak of coronavirus disease 2019 (COVID-19) originally came from an animal, likely a bat. But as WHO states currently there is no evidence that animals play a significant role in spreading SARS-CoV-2 virus to people. Based on the available information to date, the risk of animals spreading COVID-19 to people is low
- WHO confirms the possibility of COVID-19 virus transmission from humans to cats, dogs, and tigers. WHO further reported that several animals such as minks, dogs, domestic cats, lions, tigers and raccoon dogs, which have come into contact with infected people, have tested positive for Covid-19.
- A small number of pet cats, dogs, and several animals in zoos and sanctuaries have tested positive for SARS-CoV-2 in some countries including Sri Lanka and United States. It is suspected that these animals became sick after being exposed to an animal caretaker with COVID-19. In many situations, this happened despite the staff wearing personal protective equipment and following COVID-19 precautions

- WHO recommended that people with Covid-19 and people at risk should avoid contact with pets and other animals.
- We are still learning about this virus, but we know that it can spread from people to animals in some situations, especially during close contact.

APPENDIX

SARS-CoV-2 virus Variants

SARS-CoV-2, the virus that causes COVID-19, changes over time. Most changes have little to no impact on the virus' properties. However, some changes may affect the virus's properties, such as how easily it spreads, the associated disease severity, or the performance of vaccines, therapeutic medicines, diagnostic tools, or other public health and social measures. According to the WHO nomenclature, the SARS-CoV-2 virus variants identified since the start of the pandemic are listed in the table below.

Virus variant	Earliest documented sample	Date of designation	Attributes
Alpha - B.1.1.7	United Kingdom	18-Dec-2020	50% increased transmission and potential increased severity
Beta – B.1.351	South Africa	18-Dec-2020	50% increased transmission and significantly reduced susceptibility to antibody treatment
Gamma – P1	Brazil	11-Jan-2021	Significantly reduced susceptibility to antibody treatment
Delta – B.1.617.2	India	VOI: 4-Apr-2021 VOC: 11-May-2021	Increased transmissibility

Different types of vaccines and their modes of actions in the human body

The six vaccines under four types have been approved by the WHO and are currently used in different countries of the world. Types of these vaccines and their actions are specified in the table below.

Type of Vaccine	Name of the Vaccine	Mode of action in the body
Inactivated Virus	Sinopharm	Antibody production against the COVID-19 virus is stimulated in the body by inserting inactivated or weakened COVID-19 virus
	Sinovac	
Protein Subunit	Novavax	Antibody production against the virus is stimulated in the body by inserting part of the COVID-10 virus mostly fragments of spike protein
mRNA Vaccine	Pfizer BioNTech	Antibody production against the virus is stimulated in the body by inserting genetic material of COVID-19 virus (synthetic mRNA) responsible for producing spike proteins in the body and then the body produce antibodies against spike proteins of the virus
	Moderna	
Vector vaccines	AstraZeneca	Antibody production against the virus is stimulated in the body by inserting a harmless virus similar to the COVID-19 virus
	SputnicV	
	Janssen	