

A Review on Novel Corona Virus -2019: A Pandemic Disease

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ABSTRACT: COVID is an illness which causes respiratory contamination including pneumonia, cold sniffing, and hacking. This infection is sent from Human to Human or Human to Animal through Airborne beads. Six COVIDs have been known to taint human has and cause respiratory ailments. Among them, serious intense respiratory disorder COVID (SARS-CoV) and Middle East respiratory condition COVID (MERS-CoV) are zoonotic and profoundly pathogenic COVIDs that have brought about local and worldwide episodes. COVIDs have a particular morphology, the name being gotten from the external periphery, or —coronal of implanted envelope protein. Individuals from the family Coronaviridae cause an expansive range of creature and human sicknesses. Particularly, replication of the RNA genome continues through the age of a settled arrangement of viral mRNA atoms. Human COVID (HCoV) contamination makes respiratory maladies with mellow serious results. Over the most recent 15 years, we have seen the rise of two zoonotic, profoundly pathogenic HcoVs: serious intense respiratory disorder COVID (SARS-CoV) and Middle East respiratory condition COVID (MERS-Cov).

Keywords—CoronaVirus, COVID19, Epidemiology, Symptoms, Treatment, Prevention.

I. AIM & OBJECTIVE

Coronavirus disease (COVID-19) is an infectious disease caused by a newly revealed coronavirus. Most nation infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without direct special treatment. Older people and those with basic medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more probable to develop serious illness.

The specific objective of this study is to muster and give more information of this fatal virus and know about the types, transmission, symptoms, anticipation and treatment of Corona Virus.1

II. INTRODUCTION

A rare coronavirus, designated as 2019-nCoV, emerged in Wuhan, China, at the purpose of 2019. As of January 24, 2020, at least 830 action had been diagnosed in nine countries: China, Thailand, Japan, South Korea, Singapore, Vietnam, Taiwan, Nepal, and the United States. Twenty-six fatalities appear, mightily in patients who had serious subjacent sickness. Although many low-level of the emergence of this poison - such as its origin and its ability to circulate among humans - remain unknown, a growing (prenominal), incremental number of accident appearance to have proceed from humane-to-human transmission. Given the severe subtle respiratory concurrence coronavirus (SARS-CoV) mutiny in 2002 and the Middle East respiratory syndrome coronavirus (MERS-CoV) outbreak in 2012, 2019-nCoV is the third coronavirus to emerge in the earthling population in the after two decades - an emergence that has put broad common health institutions on proud alert. China re-join rapidly by informing the World Health Organization (WHO) of the outbreak and sharing sequence enlightenment with the international frequency after disclosure of the causative agent. The WHO responded apace by coordinating diagnostics development; issuance direction on forbearing monitoring, pattern mass, and usage; and providing up-to-place intelligence on the revolt. Several countries in the station as well as the United States are screening travelers from Wuhan for fever, scope to detected 2019-nCoV accident before the poison circulate further. Updates from China, Thailand, Korea, and Japan indicate that the complaint associated with 2019-nCoV appearance to be relatively assuasive as compare to with SARS and MERS. Coronaviruses make up a huge family of viruses that can infect birds and mammals, comprehend humans, according to earth health organization (WHO). These viruses have been responsible for several outbreaks around the mankind, including the severe

acute respiratory syndrome (SARS) pandemic of 2002-2003 and the Middle East respiratory syndrome (MERS) outbreak in South Korea in 2015. Most recently, a sparking International

concern, while some coronaviruses have caused devastating epidemics, others cause mild to moderate respiratory infections, like the common cold.²

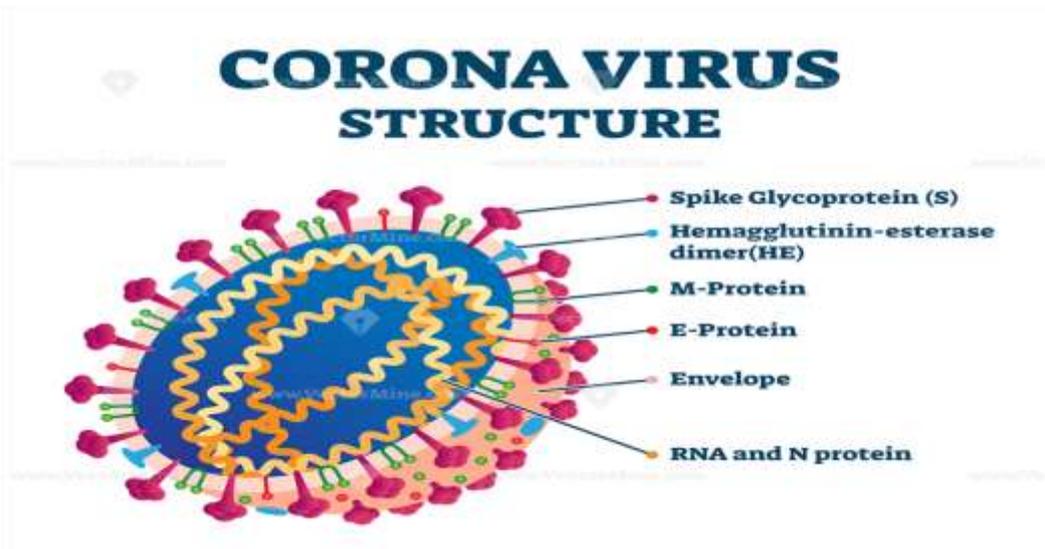


Figure 1- Structure of Corona Virus

TYPES

Coronaviruses belong to the subfamily Coronavirinae in the family Coronaviridae. Different types of human coronaviruses vary in how severe the resulting disease becomes, and how far they can spread. Doctors currently recognize seven types of coronavirus that can infect humans. Common types were:

1. 229E (alpha coronavirus)
2. NL63 (alpha coronavirus)

3. OC43 (beta coronavirus)

4. HKU1 (beta coronavirus), Rarer strains that cause more severe complications include MERS-CoV, which causes Middle East respiratory syndrome (MERS), and SARS-CoV, the virus responsible for severe acute respiratory syndrome (SARS).

In 2019, a dangerous new strain called SARSCoV-2 started circulating, causing the disease COVID-19.³

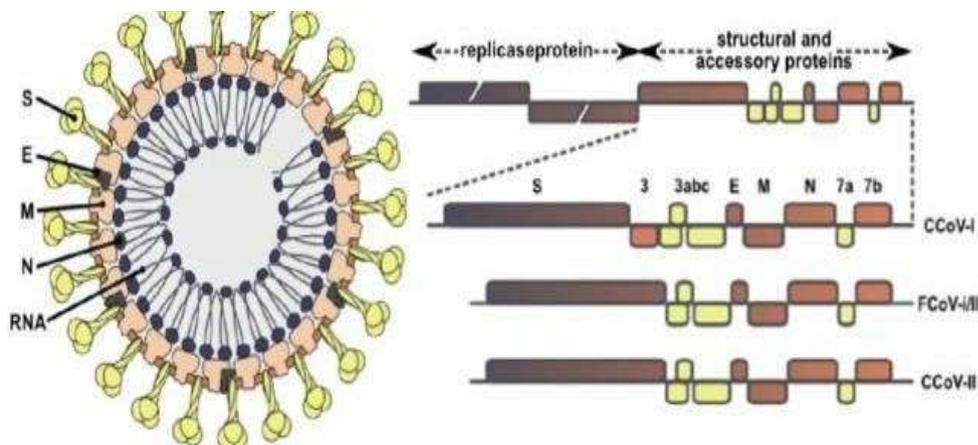


Figure 2 - Coronavirus structure and comparison of CCoV and FCoV Genome

TRANSMISSION

Transmission Limited research is available on how HCoV spreads from one person to the next. However, researchers believe that the viruses transmit via fluids in the respiratory system, such as mucus.⁴

Coronaviruses can spread in the following ways:

- Coughing and sneezing without covering the mouth can disperse droplets into the air.
- Touching or shaking hands with a person who has the virus can pass the virus between individuals.
- Making contact with a surface or object that has the virus and then touching the nose, eyes, or mouth.
- Some animal coronaviruses, such as feline coronavirus (FCoV), may spread through contact with feces.

However, it is unclear whether this also applies to human coronaviruses. The National Institutes of Health (NIH) suggest that several groups of people have the highest risk of developing complications due to COVID-19.⁵

These groups include:

- Youngchildren
- People aged 65 years or older
- Women who are pregnant

Coronaviruses will infect most people at some time during their lifetime. Coronaviruses can mutate effectively, which makes them so contagious. To prevent transmission, people should stay at home and rest while symptoms are active. They should also avoid close contact with other people. Covering the mouth and nose with a tissue or handkerchief while coughing or sneezing can also help prevent transmission. It is important to dispose of any tissues after use and maintain

hygiene around the home.⁶

Covid-19

In 2019, the Centers for Disease Control and Prevention (CDC) started monitoring the outbreak of a new coronavirus, SARS-CoV-2, which causes the respiratory illness now known as COVID-19. Authorities first identified the virus in Wuhan, China.⁷

More than 74,000 people have contracted the virus in China. Health authorities have identified many other people with COVID-19 around the world, including many in the United States. On January 31, 2020, the virus passed from one person to another in the U.S.¹⁸

The World Health Organization (WHO) have declared a public health emergency relating to COVID-19.⁹

Since then, this strain has been diagnosed in several U.S. residents. The CDC have advised that it is likely to spread to more people. COVID-19 has started causing disruption in at least 25 other countries.¹⁰

The first people with COVID-19 had links to an animal and seafood market. This fact suggested that animals initially transmitted the virus to humans. However, people with a more recent diagnosis had no connections with or exposure to the market, confirming that humans can pass the virus to each other. Information on the virus is scarce at present. In the past, respiratory conditions that develop from coronaviruses, such as SARS and MERS, have spread through close contacts. On February 17, 2020, the Director-General of the WHO presented at a media briefing the following updates on how often the symptoms of COVID-19 are severe or fatal, using data from 44,000 people with a confirmed diagnosis:

Table 1 - The Director-General also noted that the risk of serious complications increases with age. (According to the WHO)

Stage of severity	Rough percentage of people with COVID-19
Mild disease from which a person can recover	More than 80%
Severe disease, causing breathlessness and pneumonia	Around 14%
Critical disease, including septic shock, respiratory failure, and the failure of more than one organ	About 5%
Fatal disease	2%

Few children get COVID-19, although they are still investigating the reasons for this. However, while some viruses are highly contagious, it is less clear how rapidly coronaviruses will spread.¹¹

Symptoms vary from person-to-person with COVID-19. It may produce few or no symptoms. However, it can also lead to severe illness and may be fatal.¹²

COMMON SYMPTOMS INCLUDE

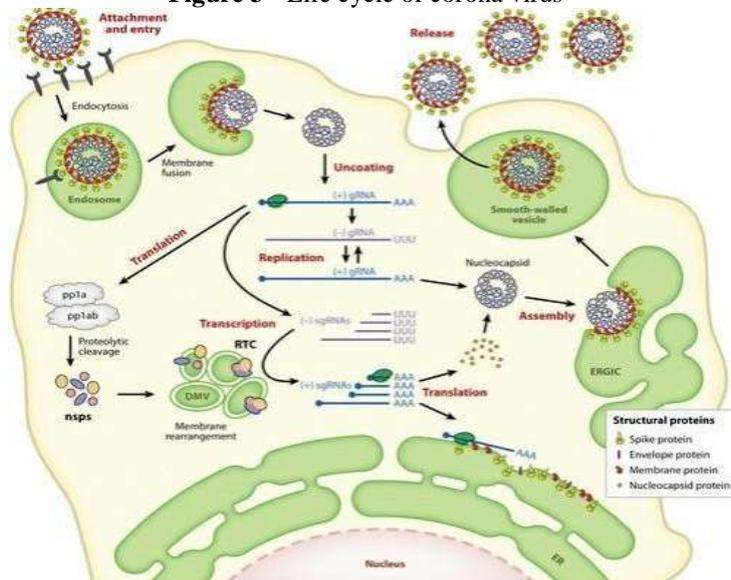
- Fever
- Breathlessness
- Cough

It may take 2–14 days for a person to notice symptoms after infection.¹³

CORONA VIRUS LIFE CYCLE STEPS

- Attachment and Entry
- Replicase Protein expression
- Replication and Transcription
- Assembly and Release¹⁴

Figure 3 - Life cycle of corona virus



EPIDEMIOLOGY AND PATHOGENESIS

All ages are susceptible. Infection is transmitted through comprehensive droplets generated during tussal and sneezing by symptomatic patients but can also appear from asymptomatic nation and before onset of symptoms. Studies have shown higher viral lot in the nasal hollowness as vie to the throat with no variation in viral refrain between symptomatic and asymptomatic people. Patients can be demoralizing for as lingering as the symptoms last and even on clinical recovery. Some followers may perform as super spreaders; a UK city who hearken a comparison in Singapore contaminate 11 other people while staying in a haunt in the French Alps and upon repay to the UK. These disease droplets can dispense 1–2 m and diluivium on surfaces. The poison can remain viable on surfaces for days in favorable atmospheric conditions but are destroyed in less than a jot by common disinfectants like

sodium hypochlorite, E949 peroxide etc.¹⁵ Infection is learned either by draft of these droplets or tangency surfaces contaminated by them or then concerning the nose, mouthpiece and eyes. The poison is also present in the defecate and infection of the water furnish and succeeding transmission via aerosolization/feco-parol route is also guess. As per current advertisement, transplacental transmission from willing females to their embryo has not been recount. However, neonatal complaint due to place-birth transmission is described. The incubation period varies from 2 to 14 d [intermediate 5 d]. Studies have recognized angiotensin receptor 2 (ACE2) as the receptor through which the poison enters the respiratory mucous membrane.

The basic case reproduction rate (BCR) is estimated to range from 2 to 6.47 in various modelling studies. In comparison, the BCR of SARS was 2 and 1.3 for pandemic flu H1N1

2009.¹⁶

Table 2 - The number of cases and death of COVID – 19 Outbreaks according to WHO

Country	Cases	Deaths
United States	7.89M	216K
India	7.24M	111K
Brazil	5.11M	151K
Russia	1.34M	23,205
Colombia	924K	28,141
Argentina	917K	24,572
Spain	896K	33,204
Peru	854K	33,419
Mexico	825K	84,420
France	756K	32,942
South Africa	695K	18,028
U.K.	635K	43,018
Iran	513K	29,349

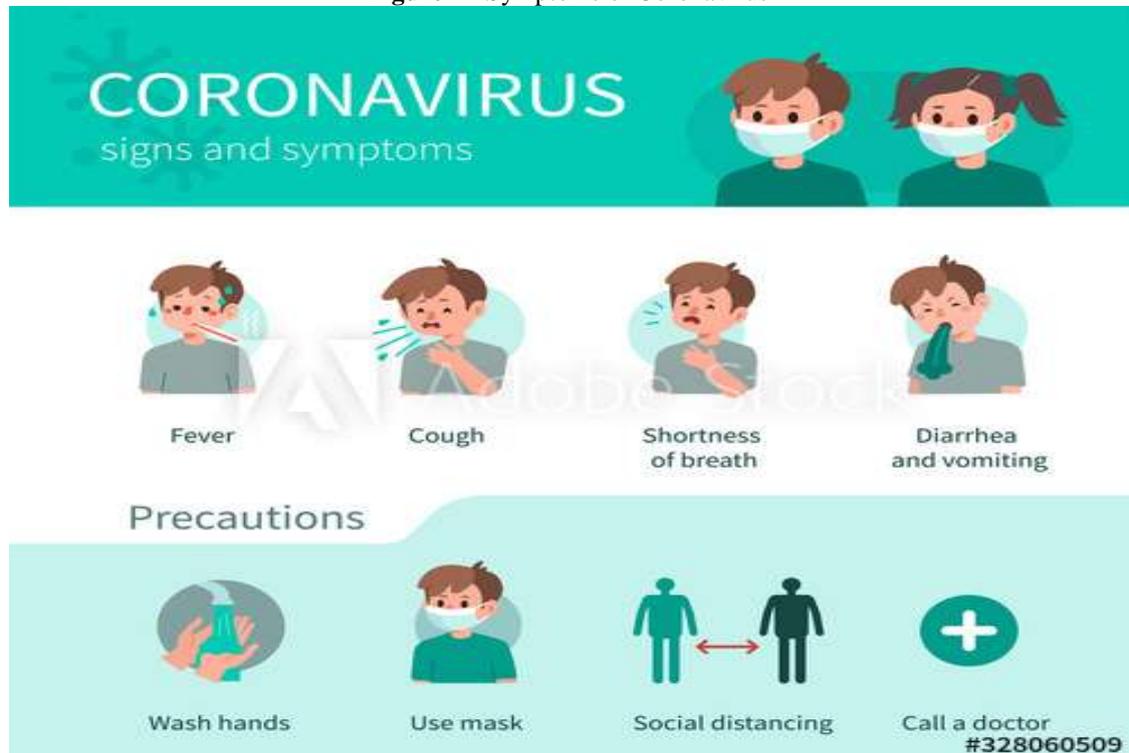
Table 3 - State/UT wise list of COVID confirmed cases.

Sr. No.	Name of State / UT	Total Confirmed cases	Cured/ Discharged	Death
1.	Maharashtra	1.54M	1.3M	40,701
2.	Andhra Pradesh	764K	714K	6,291
3.	Karnataka	726K	603K	10,123
4	Tamil Nadu	666K	612K	10,371
5.	Uttar Pradesh	442K	398K	6,466
6.	Delhi	314K	287K	5,854
7.	Kerala	310K	215K	1,066
8.	West Bengal	302K	265K	5,744
9.	Bangalore	277K	209K	3,320
10.	Odisha	260K	233K	1,072
11.	Telangana	216K	191K	1,241
12.	Gujarat	154K	135K	3,584

SYMPTOMS

Cold or flu-like symptoms usually set in from 2-4 days after a coronavirus infection and are typically mild. However, symptoms vary from person-to-person, and some forms of the virus can be fatal.

Figure 4 - Symptoms of Coronavirus



Symptoms include:

- Sneezing
- Runny nose
- Cough
- Watery diarrhea
- Fever in rare cases
- Sore throat
- Exacerbated asthma¹⁷

Scientists cannot conveniently cherish hominine coronaviruses in the laboratory different the rhinovirus, which is another foundation of the habitual reserved. This constitute it impede to adjust the impact of the coronavirus on notorious economies and public tenor. There is no restorative, so treatments in close hoax-watchfulness and over-the-counter (OTC) medicamentation. People can take several steps, including:

- Resting and avoiding overexertion
- Drinking enough water
- Avoiding smoking and smoky areas
- Taking acetaminophen, ibuprofen, or naproxen for pain and fever
- Using a clean humidifier or cool mist vaporizer
- A doctor can diagnose the virus responsible by taking a sample of respiratory fluids, such as mucus from the nose, or blood
- Standard recommendations to prevent

infection spread¹⁸

It includes:

- Regular hand washing
- Covering mouth and nose when coughing and sneezing
- Thoroughly cooking meat and eggs
- Avoid close contact with anyone showing symptoms of respiratory illness such as coughing and sneezing¹⁹

DIAGNOSIS

If you develop symptoms of coronavirus disease 2019 (COVID-19) or you've been exposed to the COVID-19 virus, contact your doctor. Also let your doctor know if you've had close contact with anyone who has been diagnosed with COVID-19.

Factors usage to decide whether to test you for the poison that causes COVID-19 may dissent depending on where you abide. Depending on your situation, you may penury to be shelter by your clinic to determine if proof is suitable and available.²⁰

In the U.S., your doctor will regulate whether to conduct tests for the virus that causes COVID-19 based on your type and symptoms, as well as whether you have had close contact with someone diagnosed with COVID-19. Your teacher

may also consider trial if you are at higher endanger of serious sickness or you are going to have a medical procedure.

To test for the COVID-19 virus, a euphoria care provider uses a yarn swab to take a match from the nose or throat. The samples are

then sent to a laboratory for testing. If you're tussis up sputum, that may be sent for proof. The U.S. Food & Drug Administration (FDA) has authorized at-domestic experiment for the COVID-19 virus. These are usable only with a doctor's formula.²¹

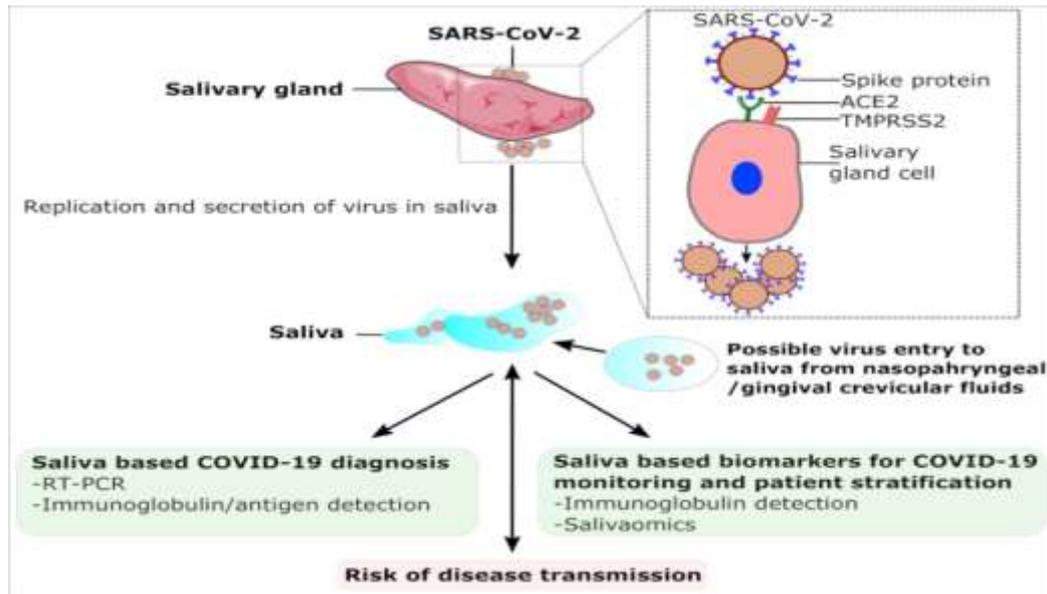


Figure 5 - Transmission Process

TREATMENT

Currently, no medication is recommended to treat COVID-19, and no cure is available. Antibiotics aren't effective against viral infections such as COVID-19. Researchers are testing a variety of possible treatments.

The FDA has granted emergency use authorization for the antiviral drug Remdesivir to treat COVID-19. The U.S. National Institutes of Health recently recommended the corticosteroid dexamethasone for people with severe COVID-19 who require supplemental oxygen or mechanical ventilation.²²

The FDA has also granted emergency use authorization for convalescent plasma therapy to treat COVID-19. Convalescent plasma is blood donated by people who've recovered from COVID-19. It's used to treat people who are ill with COVID-19 in the hospital.

Supportive care is aimed at relieving symptoms and may include:

- Pain relievers (ibuprofen or acetaminophen)

- Cough syrup or medication
- Rest
- Fluid intake²³

There is no evidence that ibuprofen or other nonsteroidal anti-inflammatory drugs (NSAIDs) need to be avoided.

If you have mild symptoms, your doctor may recommend that you recover at home. He or she may give you special instructions to monitor your symptoms and to avoid spreading the illness to others. You'll likely be asked to isolate yourself as much as possible from family and pets while you're sick, wear a mask when you're around people and pets, and use a separate bedroom and bathroom.

Your doctor will likely recommend that you stay in home isolation for a period of time except to get medical care. Your doctor will likely follow up with you regularly. Follow guidelines from your doctor and local health department about when you can end home isolation.

If you're very ill, you may need to be treated in the hospital.²⁴

PREVENTION



Figure 6 - Prevention from Corona Virus

WHAT TO DO TO KEEP YOURSELF AND OTHERS SAFE FROM COVID-19!

- **Maintain at least a 1-metre distance between yourself and others** to reduce your risk of infection when they cough sneeze or speak. Maintain an even greater distance between yourself and others when indoors. The further away, the better.
- Make wearing a mask a normal part of being around other people.

Here are the basics of how to wear a mask:

- Clean your hands before you put your mask on, as well as before and after you take it off.
- Make sure it covers your nose, mouth and chin.²⁵

Here are some specifics on what type of mask to wear and when, depending on how much virus is circulating where you live, where you go and who you are.

- Wear a fabric mask unless you're in a particular risk group. This is especially important when you can't stay physically distanced, particularly in crowded and poorly ventilated indoor settings.
- Wear a medical/surgical mask if you:
 - o Are over 60,
 - o Have underlying medical conditions,
 - o Are feeling unwell, and/or
 - o Are looking after an ill family member.
- For health workers, medical masks are essential personal protective equipment when

engaging with patients with suspected, probable or confirmed COVID-19. Respirator masks (such as FFP2, FFP3, N95, N99) should be used in settings where procedures generating aerosols are performed and must be fitted to ensure the right size is worn.

- Find out more about the science of how COVID-19 infects people and our bodies react by watching or reading this interview.²⁶

HOW TO MAKE YOUR ENVIRONMENT SAFER?

- Avoid the 3Cs: spaces that are closed, crowded or involve close contact.
 - o Outbreaks have been reported in restaurants, choir practices, fitness classes, nightclubs, offices and places of worship where people have gathered, often in crowded indoor settings where they talk loudly, shout, breathe heavily or sing.
 - o The risks of getting COVID-19 are higher in crowded and inadequately ventilated spaces where infected people spend long periods of time together in close proximity. These environments are where the virus appears to spread by respiratory droplets or aerosols more efficiently, so taking precautions is even more important.²⁷
- **Meet people outside.** Outdoor gatherings are safer than indoor ones, particularly if indoor spaces are small and without outdoor air coming in.

- **Avoid crowded or indoor settings** but if you can't, then take precautions:
 - **Open a window.** Increase the amount of 'natural ventilation' when indoors.
 - Wear a mask
 - WHO has published Q&As on ventilation and air conditioning for both the general public and people who manage public spaces and buildings.²⁸

DON'T FORGET THE BASICS OF GOOD HYGIENE!

- Regularly and thoroughly clean your hands with an alcohol-based hand rub or wash them with soap and water. This eliminates germs including viruses that may be on your hands.
- Avoid touching your eyes, nose and mouth. Hands touch many surfaces and can pick up viruses. Once contaminated, hands can transfer the virus to your eyes, nose or mouth. From there, the virus can enter your body and infect you.
- Cover your mouth and nose with your bent elbow or tissue when you cough or sneeze. Then dispose of the used tissue immediately into a closed bin and wash your hands. By following good 'respiratory hygiene', you protect the people around you from viruses, which cause colds, flu and COVID-19.²⁹

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