



Role of Frontline Workers in Prevention and Management of CORONA VIRUS



As you know a new respiratory disease called COVID-19 is spreading across the world. India has also reported cases from states and the government is trying to contain the spread of the disease. As an important frontline worker, you play a major role in preventing its spread.

Your Role as a Frontline Worker is two-fold:

1. Spread key messages in the community about measures to prevent the infection.
2. Take actions for early detection and referral of suspected COVID-19 cases.

As a key member of the primary health care team, we want you and your family to be safe. Following the advice in this document will help you in staying safe.



What is COVID-19?

COVID-19 is a disease caused by the “novel corona virus”. **Common symptoms** are:

- ▶ **Fever**
- ▶ **Dry cough**
- ▶ **Breathing difficulty**
- ▶ Some patients also have aches and pains, nasal congestion, runny nose, sore throat or diarrhoea

About 80% of confirmed cases recover from the disease without any serious complications. However, one out of every six people who gets COVID-19 can become seriously ill* and develop difficulty in breathing. In more severe cases, infection can cause severe pneumonia and other complications which can be treated only at higher level facilities (District Hospitals and above). In a few cases it may even cause death.

* Source: WHO

How does COVID-19 spread?

- ▶ COVID-19 spreads mainly by droplets produced as a result of coughing or sneezing of a COVID-19 infected person. This can happen in two ways:
 - ♦ **Direct close contact:** one can get the infection by being in close contact with COVID-19 patients (within one Metre of the infected person), especially if they do not cover their face when coughing or sneezing.
 - ♦ **Indirect contact:** the droplets survive on surfaces and clothes for many days. Therefore, touching any such infected surface or cloth and then touching one's mouth, nose or eyes can transmit the disease.
- ▶ The incubation period of COVID 19 (time between getting the infection and showing symptoms) is 1 to 14 days
- ▶ Some people with the infection, but without any serious symptoms can also spread the disease.

Which group of people are at higher risk of getting infected?



- ▶ People who have travelled to other countries in last 14 days and their family members.
- ▶ People coming from other states if they have been working with people who travelled to other countries in last 14 days.
- ▶ Family members and contacts of patients confirmed to have COVID-19.
- ▶ People older than 60 years of age and people with medical problems like high blood pressure, heart problems, respiratory disease/asthma, cancer or diabetes are at higher risk for developing serious complications..

Key messages to spread for prevention of COVID-19

1. How to avoid getting COVID-19 or spreading it?



a) Practice Social Distancing:

- ▶ **Avoid gatherings** such as melas, haats, gatherings in religious places, social functions etc.
- ▶ **Maintain a safe distance** of at least one Metre between you and other people when in public places, especially if they are having symptoms such as cough, fever etc. to avoid direct droplet contact.
- ▶ **Stay at home** as much as possible.
- ▶ **Avoid physical contact** like handshakes, hand holding or hugs.
- ▶ **Avoid touching surfaces** such as table tops, chairs, door handles etc.



b) Practice good hygiene

▶ Wash your hands frequently using soap and water:

- ♦ After coming home from outside or meeting other people especially if they are ill.
- ♦ After having touched your face, coughing or sneezing.
- ♦ Before preparing food, eating or feeding children.
- ♦ Before and after using toilet, cleaning etc.



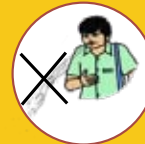
Steps of hand washing



Duration 20 seconds



- ▶ While coughing or sneezing cover your nose and mouth with handkerchief. Wash the handkerchief at least daily
- ▶ It is preferable to **cough/sneeze into your bent elbow rather than your palms.**





- ▶ **Do not Spit or shout** in public places to avoid the spread of droplets.
- ▶ **Do not touch your eyes, nose and mouth** with unclean hands.
- ▶ Ensure that the surfaces and objects are regularly cleaned.

2. What to do if you are having symptoms or have travelled to other countries or states in past two weeks?

- Symptoms of COVID 19 and seasonal respiratory illness (common cold/flu) are similar. All people with these symptoms may not have COVID 19.
- Following persons should be quarantined for 14 days at home as a precaution:
 - ▶ People who have travelled to COVID 19 affected countries/areas in past 14 days
 - ▶ Those who have come in close contact with a suspected/confirmed COVID 19 patient
 - ▶ Those who develop symptoms
- These persons should inform you. If symptoms become severe then the person should visit a health facility after speaking with you.



For any COVID 19 related queries, call your State Helpline/Ministry of Health & Family Welfare's 24X7 helpline at 1075 or 011-23978046.

Your role in early detection and referral



- ▶ As a community worker you may be asked to prepare a line list of all people who have travelled to other countries or other states inside India in last 14 days:
 - ◆ Share their names with your Medical Officer at PHC but not with others
 - ◆ Teach them Home Quarantine for next 14 days
 - ◆ Tell them to monitor themselves for symptoms of COVID-19
 - ◆ Tell them to inform you if symptoms develop and call the COVID 19 Helpline



- ▶ **Instructions for the person being Home Quarantined**
 - ◆ Stay in a separate room at home, if possible with an attached/separate toilet. Try to maintain a distance of at least 1 meter from others
 - ◆ Wear a mask at all times. If masks are not available, take a clean cotton cloth, fold it into a double layer and tie it on your face to cover your nose and mouth
 - ◆ Use separate dishes, towels, bedding etc. which should be cleaned separately
 - ◆ The surfaces such as floor, table tops, chairs, door handles etc. should be cleaned at least once a day
 - ◆ Make sure that only one assigned family member is the caretaker



- ▶ **Instructions for the caretaker of the Home Quarantined person:**
 - ◆ Keep a distance of one metre when entering the room
 - ◆ Wear a mask or cover your face with double layered cotton cloth
 - ◆ Wash your hands after coming out of the room
- ▶ **How to use masks (or cloth covering the nose and mouth)**
 - ◆ Wash your hands before putting on the mask
 - ◆ Make sure that it covers both mouth and nose and is not loose.
 - ◆ Do not touch the mask from the front, touch only from the sides.
 - ◆ Make sure to wash your hands after changing the mask
 - ◆ Change the mask every 6-8 hours or when it becomes moist
 - ◆ If using disposable masks, have a dustbin with cover and a plastic bag lining to throw the masks in.
 - ◆ If using cloth masks, wash them at least daily

How to take care of yourself and carry on with your duties as a frontline worker?

- ▶ **Take all preventive measures** that you are talking about in the community such as keeping safe distance, washing hands frequently including before and after home visits. Carry your own soap if necessary
- ▶ If you are visiting or **accompanying a suspected case** to any health facility, make sure to cover both your mouth and nose with folded cloth or mask.
- ▶ If you are conducting community meetings or supporting outreach sessions the **groups should not be larger than 10-12 people**.
- ▶ Maintaining safe distances for those living in crowded areas or the homeless is going to be difficult. Even then you should inform them about preventive measures and support them as required.
- ▶ **Self-monitor** for signs of illness and report to the Medical Officer, immediately if any symptoms develop.
- ▶ **Ensure that you continue to undertake tasks** related to care of pregnant women, newborns and sick children, Post Natal Care, Breastfeeding and Nutritional Counselling, TB and NCD patient follow up while taking preventive measures.
- ▶ Remember older people are at higher risk, so take **special care to visit homes of elderly people**.
- ▶ **Continue to pay special attention to the marginalized**, as is your routine practice.
- ▶ Also as the people's trusted health worker, try to **reassure them** that while those with symptoms and high risk need close attention, for others, prevention measures will decrease the risk of getting the disease.

Myths vs. reality for COVID-19

As COVID-19 is a new condition, there are many common myths.

Myths	Facts
1. The corona virus can be transmitted through mosquitoes.	The corona virus CANNOT be transmitted through mosquito bites.
2. Everyone should wear a mask.	People who should wear a mask are: <ul style="list-style-type: none">▶ Those having symptom of fever, cough etc.▶ Healthcare workers in facilities caring for ill people▶ The assigned care taker of a home quarantined person▶ Even those wearing masks should wash their hands frequently
3. Only people with symptoms of COVID-19 can spread the disease.	Even people with the COVID-19 infection but no symptoms can spread the disease.
4. Eating garlic and drinking alcohol can prevent COVID 19	Eating garlic and drinking alcohol DOES NOT prevent COVID 19



Ministry of Health & Family Welfare
Government of India





Detail Question and Answers on COVID-19 for Public

What is corona virus

Corona viruses are a large family of viruses which may cause illness in animals or humans. In humans, several coronaviruses are known to cause respiratory infections ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The most recently discovered coronavirus causes coronavirus disease COVID-19.

What is COVID-19

COVID-19 is the infectious disease caused by the most recently discovered corona virus. This new virus and disease were unknown before the outbreak began in Wuhan, China, in December 2019.

What are the symptoms of COVID-19

The most common symptoms of COVID-19 are fever, tiredness, and dry cough. Some patients may have aches and pains, nasal congestion, runny nose, sore throat or diarrhea. These symptoms are usually mild and begin gradually. Some people become infected but don't develop any symptoms and don't feel unwell. Most people (about 80%) recover from the disease without needing special treatment. Around 1 out of every 6 people who gets COVID-19 becomes seriously ill and develops difficulty breathing. Older people, and those with underlying medical problems like high blood pressure, heart problems or diabetes, are more likely to develop serious illness. People with fever, cough and difficulty breathing should seek medical attention.

How does COVID-19 spread

People can catch COVID-19 from others who have the virus. The disease can spread from person to person through small droplets from the nose or mouth which are spread when a person with COVID-19 coughs or exhales. These droplets land on objects and surfaces around the person. Other people then catch COVID-19 by touching these objects or surfaces, then touching their eyes, nose or mouth. People can also catch COVID-19 if they breathe in droplets from a person with COVID-19 who coughs out or exhales droplets. This is why it is important to stay more than 1 meter (3 feet) away from a person who is sick.

Can the virus that causes COVID-19 be transmitted through the air?

Studies to date suggest that the virus that causes COVID-19 is mainly transmitted through contact with respiratory droplets rather than through the air. See previous answer on “How does COVID-19 spread?”

Can COVID-19 be caught from a person who has no symptoms?

The main way the disease spreads is through respiratory droplets expelled by someone who is coughing. The risk of catching COVID-19 from someone with no symptoms at all is very low. However, many people with COVID-19 experience only mild symptoms. This is particularly true at the early stages of the disease. It is therefore possible to catch COVID-19 from someone who has, for example, just a mild cough and does not feel ill.

Can I catch COVID-19 from the feces of someone with the disease?

The risk of catching COVID-19 from the feces of an infected person appears to be low. While initial investigations suggest the virus may be present in feces in some cases, spread through this route is not a

main feature of the outbreak. The ongoing research on the ways COVID-19 is spread and will continue to share new findings. Because this is a risk, however, it is another reason to clean hands regularly, after using the bathroom and before eating.

What can I do to protect myself and prevent the spread of disease

Protection measures for everyone

Stay aware of the latest information on the COVID-19 outbreak, available on the national, state and local public health authority. Many countries around the world have seen cases of COVID-19 and several have seen outbreaks. Authorities in China and some other countries have succeeded in slowing or stopping their outbreaks. However, the situation is unpredictable so check regularly for the latest news.

You can reduce your chances of being infected or spreading COVID-19 by taking some simple precautions:

- Regularly and thoroughly clean your hands with an alcohol-based hand rub or wash them with soap and water. Why? Washing your hands with soap and water or using alcohol-based hand rub kills viruses that may be on your hands.
- Maintain at least 1 metre (3 feet) distance between yourself and anyone who is coughing or sneezing. Why? When someone coughs or sneezes they spray small liquid droplets from their nose or mouth which may contain virus. If you are too close, you can breathe in the droplets, including the COVID-19 virus if the person coughing has the disease.
- Avoid touching eyes, nose and mouth. Why? 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 can make you sick.
- Make sure you, and the people around you, follow good respiratory hygiene. This means covering your mouth and nose with your bent elbow or tissue when you cough or sneeze. Then

dispose of the used tissue immediately. Why? Droplets spread virus. By following good respiratory hygiene you protect the people around you from viruses such as cold, flu and COVID-19.

- Stay home if you feel unwell. If you have a fever, cough and difficulty breathing, seek medical attention and call in advance. Follow the directions of your local health authority. Why? National and local authorities will have the most up to date information on the situation in your area. Calling in advance will allow your health care provider to quickly direct you to the right health facility. This will also protect you and help prevent spread of viruses and other infections.
- Keep up to date on the latest COVID-19 hotspots (cities or local areas where COVID-19 is spreading widely). If possible, avoid traveling to places – especially if you are an older person or have diabetes, heart or lung disease. Why? You have a higher chance of catching COVID-19 in one of these areas.

Protection measures for persons who are in or have recently visited (past 14 days) areas where COVID-19 is spreading

- Follow the guidance outlined above (Protection measures for everyone)
- Self-isolate by staying at home if you begin to feel unwell, even with mild symptoms such as headache, low grade fever (37.3 C or above) and slight runny nose, until you recover. If it is essential for you to have someone bring you supplies or to go out, e.g. to buy food, then wear a mask to avoid infecting other people. Why? Avoiding contact with others and visits to medical facilities will allow these facilities to operate more effectively and help protect you and others from possible COVID-19 and other viruses.
- If you develop fever, cough and difficulty breathing, seek medical advice promptly as this may be due to a respiratory infection or other serious condition. Call in advance and tell your provider of any recent travel or contact with travelers. Why? Calling in advance will allow your health care provider to quickly direct you to the right health facility. This will also help to prevent possible spread of COVID-19 and other viruses.

How likely am I to catch COVID-19?

The risk depends on where you are - and more specifically, whether there is a COVID-19 outbreak unfolding there.

For most people in most locations the risk of catching COVID-19 is still low. However, there are now places around the world (cities or areas) where the disease is spreading. For people living in, or visiting, these areas the risk of catching COVID-19 is higher. Governments and health authorities are taking vigorous action every time a new case of COVID-19 is identified. Be sure to comply with any local restrictions on travel, movement or large gatherings. Cooperating with disease control efforts will reduce your risk of catching or spreading COVID-19.

COVID-19 outbreaks can be contained and transmission stopped, as has been shown in China and some other countries. Unfortunately, new outbreaks can emerge rapidly. It's important to be aware of the situation where you are or intend to go.

Should I worry about COVID-19?

Illness due to COVID-19 infection is generally mild, especially for children and young adults. However, it can cause serious illness: about 1 in every 5 people who catch it need hospital care. It is therefore quite normal for people to worry about how the COVID-19 outbreak will affect them and their loved ones.

We can channel our concerns into actions to protect ourselves, our loved ones and our communities. First and foremost among these actions is regular and thorough hand-washing and good respiratory hygiene. Secondly, keep informed and follow the advice of the local health authorities including any restrictions put in place on travel, movement and gatherings.

Who is at risk of developing severe illness

While we are still learning about how COVID-2019 affects people, older persons and persons with pre-existing medical conditions (such as high blood pressure, heart disease, lung disease, cancer or diabetes) appear to develop serious illness more often than others.

Are antibiotics effective in preventing or treating the COVID-19?

No. Antibiotics do not work against viruses, they only work on bacterial infections. COVID-19 is caused by a virus, so antibiotics do not work. Antibiotics should not be used as a means of prevention or treatment of COVID-19. They should only be used as directed by a physician to treat a bacterial infection.

Are there any medicines or therapies that can prevent or cure COVID-19

While some western, traditional or home remedies may provide comfort and alleviate symptoms of COVID-19, there is no evidence that current medicine can prevent or cure the disease. We does not recommend self-medication with any medicines, including antibiotics, as a prevention or cure for COVID-19. However, there are several ongoing clinical trials that include both western and traditional medicines. We will continue to provide updated information as soon as clinical findings are available.

Is COVID-19 the same as SARS?

No. The virus that causes COVID-19 and the one that caused the outbreak of Severe Acute Respiratory Syndrome (SARS) in 2003 are related to each other genetically, but the diseases they cause are quite different.

SARS was more deadly but much less infectious than COVID-19. There have been no outbreaks of SARS anywhere in the world since 2003.

Should I wear mask to protect myself

Only wear a mask if you are ill with COVID-19 symptoms (especially coughing) or looking after someone who may have COVID-19. Disposable face mask can only be used once. If you are not ill or looking after someone who is ill then you are wasting a mask. There is a world-wide shortage of masks, so We urge people to use masks wisely.

We advises rational use of medical masks to avoid unnecessary wastage of precious resources and mis-use of masks The most effective ways to protect yourself and others against COVID-19 are to frequently clean your hands, cover your cough with the bend of elbow or tissue and maintain a distance of at least 1 meter (3 feet) from people who are coughing or sneezing.

How to put on use take off and dispose of a mask?

1. Remember, a mask should only be used by health workers, care takers, and individuals with respiratory symptoms, such as fever and cough.
2. Before touching the mask, clean hands with an alcohol-based hand rub or soap and water
3. Take the mask and inspect it for tears or holes.
4. Orient which side is the top side (where the metal strip is).
5. Ensure the proper side of the mask faces outwards (the coloured side).
6. Place the mask to your face. Pinch the metal strip or stiff edge of the mask so it moulds to the shape of your nose.
7. Pull down the mask's bottom so it covers your mouth and your chin.
8. After use, take off the mask; remove the elastic loops from behind the ears while keeping the mask away from your face and clothes, to avoid touching potentially contaminated surfaces of the mask.
9. Discard the mask in a closed bin immediately after use.
10. Perform hand hygiene after touching or discarding the mask
 - Use alcohol-based hand rub or, if visibly soiled, wash your hands with soap and water.

How long is the incubation period for COVID-19?

The “incubation period” means the time between catching the virus and beginning to have symptoms of the disease. Most estimates of the incubation period for COVID-19 range from 1-14 days, most commonly around five days. These estimates will be updated as more data become available.

Can humans become infected with the COVID-19 from an animal source?

Coronaviruses are a large family of viruses that are common in animals. Occasionally, people get infected with these viruses which

may then spread to other people. For example, SARS-CoV was associated with civet cats and MERS-CoV is transmitted by dromedary camels. Possible animal sources of COVID-19 have not yet been confirmed.

To protect yourself, such as when visiting live animal markets, avoid direct contact with animals and surfaces in contact with animals. Ensure good food safety practices at all times. Handle raw meat, milk or animal organs with care to avoid contamination of uncooked foods and avoid consuming raw or undercooked animal products.

Can I catch COVID-19 from my pet?

While there has been one instance of a dog being infected in Hong Kong, to date, there is no evidence that a dog, cat or any pet can transmit COVID-19. COVID-19 is mainly spread through droplets produced when an infected person coughs, sneezes, or speaks. To protect yourself, clean your hands frequently and thoroughly.

We continue to monitor the latest research on this and other COVID-19 topics and will update as new findings are available.

How long does the virus survive on surfaces?

It is not certain how long the virus that causes COVID-19 survives on surfaces, but it seems to behave like other corona viruses. Studies suggest that corona viruses (including preliminary information on the COVID-19 virus) may persist on surfaces for a few hours or up to several days. This may vary under different conditions (e.g. type of surface, temperature or humidity of the environment).

If you think a surface may be infected, clean it with simple disinfectant to kill the virus and protect yourself and others. Clean your hands with

an alcohol-based hand rub or wash them with soap and water. Avoid touching your eyes, mouth, or nose.

Is it safe to receive a package from any area where COVID-19 has been reported?

Yes. The likelihood of an infected person contaminating commercial goods is low and the risk of catching the virus that causes COVID-19 from a package that has been moved, travelled, and exposed to different conditions and temperature is also low.

Is there anything I should not do?

The following measures **ARE NOT** effective against COVID-2019 and can be harmful:

- Smoking
- Wearing multiple masks
- Taking antibiotics (See question 10 "*Are there any medicines or therapies that can prevent or cure COVID-19?*")

In any case, if you have fever, cough and difficulty breathing seek medical care early to reduce the risk of developing a more severe infection and be sure to share your recent travel history with your health care provider.

Coronavirus (COVID-19) FAQs



Find answers to some of the most common questions about COVID-19.

You can also learn more about the new coronavirus on our [COVID-19 page](#).

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About COVID-19

What is COVID-19?

COVID-19, otherwise known as coronavirus disease 2019, is a new infectious disease caused by a previously unknown virus called SARS-CoV-2. The virus is part of a family of coronaviruses which are responsible for lots of different illnesses from the common cold to the flu. But this new strain can be more severe in some people.

When did COVID-19 start?

The virus was discovered in Wuhan, China in December 2019 and has since spread around the world. It was declared a pandemic by the World Health Organization in March 2020.

Symptoms and treatment

What are the common symptoms?

The main symptoms of COVID-19 are:

- fever,
- dry cough,
- tiredness,
- loss of taste or smell.

Some people experience other flu-like symptoms, including: nasal congestion, conjunctivitis (red eyes), sore throat, headache, muscle or joint pain, skin rash, nausea or vomiting, diarrhoea, chills or dizziness. These symptoms can be managed at home.

Not everyone who has COVID-19 will have symptoms. You can still pass COVID-19 on even if you don't have symptoms. That's why it's important to follow advice to stop the virus from spreading.

What happens in serious cases of COVID-19?

In some cases, people will become more seriously ill with COVID-19. Symptoms of severe COVID-19 include shortness of breath, loss of speech or mobility, confusion, chest pain or a high temperature. If you experience any of these symptoms, it's important to seek medical care straight away. In critical cases, COVID-19 can lead to death.

When do symptoms start to appear?

The average time for symptoms of COVID-19 to develop is five to six days, but it can take up to 14 days for people to show symptoms.

Are there long-term effects of COVID-19?

Some people have reported experiencing continued symptoms after having COVID-19, such as fatigue, breathing problems and neurological problems. This includes people with less severe cases of COVID-19, as well as those who have needed hospital care.

Research is currently underway to better understand how many people experience long-term effects of COVID-19, and the nature of these symptoms.

What should I do if I think I have COVID-19?

If you think you have COVID-19, stay at home and self-isolate – even if your symptoms are mild.

Call your local health service for advice. They will tell you what to do, including if you need to take a COVID-19 test and how to do it. Do not visit your clinic as you could pass the virus onto others.

The people you live with will also need to stay home for at least 14 days from when you first developed symptoms. Avoid close contact with others in your household while you're ill. Stay one metre apart, or in another room if possible. If you live with someone who's more vulnerable, try to

arrange for them to stay elsewhere. You can also wear a medical mask to reduce the risk of infection.

Do not leave your home for any reason, including going to work or school while you are self-isolating. Ask friends or neighbours to bring what you need, and leave it outside. Do not invite other people to come to your home to help look after you, as you will be putting them at risk of getting the virus.

If you have difficulty breathing and/or persistent pain in your chest, call your local health service immediately.

Most people will recover from COVID-19 by themselves, without the need for hospital treatment.

Do I need to get tested for COVID-19?

If you have symptoms of COVID-19 or have been in close contact with someone who has symptoms or has tested positive, call your health care provider to see if and when you should take a test.

The availability of tests for COVID-19 will vary depending on where you live. In places where access to testing is limited, priority may be given to people with severe symptoms, health workers and people with a higher risk of getting ill.

While you're waiting for your results, it's important that you stay at home and self-isolate. If your test result is positive, continue to self-isolate and call your health care provider for further advice.

If your result is negative, it does not mean you are immune and you will still need to follow the prevention advice. If you have tested negative but someone you live with has tested positive, you should continue to isolate.

Does COVID-19 need treatment?

The majority of people who get COVID-19 recover at home, without needing special treatment, usually within about seven days.

Most people will only have mild symptoms similar to the common cold. Resting, drinking lots of liquids, and taking paracetamol or other home remedies can help with symptoms.

Around 15 in 100 people who get COVID-19 will become severely ill and develop difficulty breathing, in which case they will need hospital care. A small number of these people will become critically ill and need intensive care.

Who is more vulnerable to COVID-19?

Anyone can get COVID-19 and become seriously ill. The likelihood becoming severely ill is higher for people over 60 and those with certain underlying health issues, including high blood pressure, heart or lung problems, diabetes, obesity or cancer.

People with a weakened immune system – for example if they are having chemotherapy treatment for cancer, or have a low CD4 count as a result of HIV – are also at a higher risk of serious illness.

Is there a cure for COVID-19?

So far, no drugs are proven to specifically treat COVID-19. As scientists and doctors continue to learn

more about COVID-19, our knowledge of, and ability to treat the virus will improve.

Vaccine

Is there a vaccine for COVID-19?

Several COVID-19 vaccines are now being distributed around the world. Check the official advice where you live to find out when the vaccine will be available to you.

COVID-19 vaccines work by helping your body develop immunity to the virus that causes COVID-19. This means your body will be ready to respond faster to the virus if you are exposed to it, so you'll be less likely to get seriously ill.

Evidence shows the current vaccines can protect people from getting sick from COVID-19. However, we are still learning more about how effective they are at stopping the virus from being passed on between people. That's why it's important to continue to follow the prevention advice, even after having the vaccine.

Transmission and prevention

How is COVID-19 passed on?

COVID-19 is passed on through contact with respiratory droplets (droplets of saliva or mucus from the nose or mouth) from someone who has the virus. These tiny droplets are spread when an infected person sneezes, coughs, breathes, speaks or sings.

This mainly occurs when people come into close contact with someone who has COVID-19, and the virus gets into their mouth, nose or eyes.

These droplets can also land on nearby surfaces and objects. The virus is then spread when another person touches the droplets and then touches their own face – particularly eyes, nose or mouth – without washing their hands first.

Is COVID-19 passed on more easily indoors?

There is evidence that COVID-19 is passed on more easily in indoor, crowded and poorly ventilated places where people are closer together for long periods of time. This includes restaurants, gyms, nightclubs, offices and places of worship.

Can COVID-19 be passed on through sex?

COVID-19 is not a sexually transmitted infection. However, having sex with someone means getting very close to them, which can spread the virus. It can also be passed on through saliva when kissing.

Some initial evidence has found COVID-19 can be spread through poop (faeces), so rimming (performing oral sex on your partner's anus) might increase your risk of getting the virus.

If you or your partner is feeling unwell, it's best to avoid having any sexual contact – including kissing and cuddling.

Learn more on our [sex and COVID-19 page](#).

Can COVID-19 be passed from mother-to-child?

Emerging evidence suggests that it may be possible for mothers to pass on COVID-19 to their babies through pregnancy or birth, but this is uncommon.¹

Pregnant women should continue to follow advice to protect themselves from the virus, and seek medical care straight away if they have symptoms.

There is currently no strong evidence that COVID-19 can be passed on through breastfeeding.² However, due to the close contact involved, there is a risk that a mother could pass COVID-19 onto her baby by coughing, sneezing or breathing heavily while breastfeeding. If you have symptoms of COVID-19, consider wearing a face mask while breastfeeding, washing your hands before and after holding your baby, and regularly disinfecting surfaces you have touched to minimise the risk of passing the virus on.

How can I stop the spread of COVID-19?

The main ways you can stop the virus spreading are:

1. Keeping a one metre distance from people as much as possible, and even more when you are indoors.
2. Wearing a face mask when you are around other people.

Other prevention measures include:

- avoiding places that are crowded, confined or involve close contact, especially indoors,
- washing your hands regularly with soap and water for at least 40 seconds – if you don't have access to clean water and soap, use an alcohol-based hand sanitizer and keep rubbing it into your hands for 20 seconds,
- getting a COVID-19 vaccine when you are offered it,
- avoiding touching your face,
- keeping indoor spaces well ventilated when you are inside with other people,
- sneezing or coughing into a clean tissue, and then throw it away and wash your hands - if you don't have a tissue, use the inside of your elbow to cover your mouth,
- only meeting people outdoors, if you are allowed to meet with people from outside your household ,
- regularly cleaning and disinfecting surfaces,
- staying at home if you feel unwell, and calling your healthcare provider for advice.

When should I wear a face mask?

The World Health Organisation recommends using face masks when you are not able to stay at least one meter away from others. This includes indoor public places such as shopping centres, religious buildings, restaurants, schools and public transport. Masks are also recommended in some outdoor places, such as busy markets, crowded streets and bus stops.

You should also wear a mask in rooms with poor ventilation, or if someone visits your home and you cannot keep a one-meter distance.

Depending on where you live in the world, there may be laws requiring you to wear face masks in other situations. It's important to know and follow the local guidance.

What type of face mask should I wear?

There are two types of face masks, fabric masks (which you can make yourself or buy) and medical masks (which are in short supply and needed by healthcare workers).

Non-medical fabric face masks

- prevent the wearer from passing COVID-19 on to others,
- should be made from multiple layers of fabric ([see the WHO's recommended fabric face mask materials](#)),
- are for healthy people to wear, because there is evidence that some people infected with COVID-19 have no symptoms but may still be able to transmit the virus,
- do not protect you from getting COVID-19, so it's important that you maintain social distancing and don't rely on only a fabric mask for protection.

Medical masks

- prevent the wearer from getting infected and from passing COVID-19 on
- are in short supply globally and should be prioritised for health workers, people with COVID-19 symptoms, people who have tested positive for COVID-19 or are waiting for their test results, and those caring for people with COVID-19 symptoms
- should be used by at-risk groups (including those aged over 60 and anyone with pre-existing medical conditions)

Both fabric and medical-grade face masks are only effective when used correctly. Some general tips include:

- clean your hands before and after touching your mask,
- make sure your mask fits closely, covering your nose, mouth and chin with no gaps on the sides,
- don't wear a mask that is damaged, dirty or wet,
- have your own mask – don't share it with others,
- avoid pulling down your mask when talking to others,
- don't wear your mask on your chin, neck, forehead, around your arm or hanging from your ear.

Masks should be used alongside other prevention measures, such as physical distancing where possible, frequent handwashing and avoiding touching your face or mask. The World Health Organization has a series of [videos and infographics on how to wear different types of masks](#).

What if I have been in contact with someone who has COVID-19?

If you have come into contact with someone who has symptoms of COVID-19, call your health care provider to find out if you are able to take a test. If testing is not available where you live, you will need to self-isolate for 14 days. Make sure you cooperate with any contact-tracing procedures in your area to control the spread of the virus.

HIV and COVID-19

Are people living with HIV more at risk?

Our understanding of the risk of COVID-19 in people living with HIV is evolving. Current evidence suggests that HIV people living with HIV are at greater risk of becoming seriously ill, and dying, from COVID-19. However, HIV is less of a risk factor than other health conditions, such as high blood pressure, heart disease, lung disease, cancer, diabetes, or being over a certain age.

People living with HIV who have a compromised immune system may be at greater risk and should take extra steps to prevent infection. This includes people with a low CD4 count (<350 copies/cell), a high viral load, a recent opportunistic infection, or a current AIDS-defining illness.

The best way to stay healthy is by taking your antiretroviral treatment.

To find out more, read our [coronavirus and HIV page](#).

How can people living with HIV prepare for COVID-19?

People living with HIV should follow the general prevention advice for COVID-19. It's also important to:

- continue taking your antiretroviral treatment (ART) as prescribed to keep your immune system healthy,
- stock up on ART, and any other medication you need to take, so you have at least a 30-day supply, ideally three months if possible,
- make sure your immunisations/vaccinations are up to date (such as flu and pneumonia vaccines),
- have a plan in place for staying at home, including how you will get hold of food and medicine and how to contact your healthcare facility if necessary,
- take care of yourself by eating well, exercising as best you can (even at home), and looking after your mental health.

HELP US HELP OTHERS

Avert.org is helping to prevent the spread of HIV and improve sexual health by giving people trusted, up-to date information.

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Can you support us and protect our future?

Every contribution helps, no matter how small.

PLEASE DONATE NOW

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Frequently Asked Questions on COVID-19 Vaccine

Target Group: General Public

S. No.	Question	Potential response
1.	Is a COVID vaccine scheduled anytime soon	Yes, vaccine trials are under different stages of finalization. Government of India is geared to launch a vaccine for COVID 19 soon. For more information and updates visit www.mohfw.gov.in
2.	Will COVID 19 vaccine be given to everyone simultaneously	<p>Based on the potential availability of vaccines the Government of India has selected the priority groups who will be vaccinated on priority as they are at higher risk.</p> <p>The first group includes healthcare and frontline workers. The second group to receive COVID 19 vaccine will be persons over 50 years of age and persons under 50 years with comorbid conditions</p>
3.	Is it mandatory to take the vaccine?	Vaccination for COVID-19 is voluntary. However, it is advisable to receive the complete schedule of COVID-19 vaccine for protecting one-self against this disease and also to limit the spread of this disease to the close contacts including family members, friends, relatives and co-workers.
4.	Will the vaccine be safe as it is being tested and introduced in a short span of time?	Vaccines will be introduced in the country only after the regulatory bodies clear it based on its safety and efficacy.

5.	Can a person presently having COVID-19 (confirmed or suspected) infection be vaccinated?	Person with confirmed or suspected COVID-19 infection may increase the risk of spreading the same to others at vaccination site. For this reason, infected individuals should defer vaccination for 14 days after symptoms resolution.
6.	Is it necessary for a COVID recovered person to take the vaccine?	Yes, it is advisable to receive complete schedule of COVID vaccine irrespective of past history of infection with COVID-19. This will help in developing a strong immune response against the disease.
7.	Out of the multiple vaccines available, how is one or more vaccine chosen for administration?	<p>The safety and efficacy data from clinical trials of vaccine candidates are examined by Drug regulator of our country before granting the license for the same. Hence, all the COVID-19 vaccines that receive license will have comparable safety and efficacy.</p> <p>However, it must be ensured that the entire schedule of vaccination is completed by only one type of vaccine as different COVID-19 vaccines are not interchangeable.</p>
8.	Does India have the capacity to store the COVID vaccine at temperature of +2 to +8 degree Celsius and transport them at required temperature?	India runs one of the largest Immunization programme in the world, catering to the vaccination needs of more than 26 million newborns and 29 million pregnant women. The programme mechanisms are being strengthened / geared up to effectively cater to the country's large and diverse population.

9.	Will the vaccine introduced in India be as effective as the ones introduced in other countries?	Yes. The COVID 19 vaccine introduced in India will be as effective as any vaccine developed by other countries. Various phases of vaccine trials are undertaken to ensure its safety and efficacy.
10.	How will I know if I am eligible for vaccination?	<p>In the initial phase, COVID 19 vaccine will be provided to the priority group- Health Care and Front-line workers.</p> <p>The 50 plus age group may also begin early based on vaccine availability.</p> <p>The eligible beneficiaries will be informed through their registered mobile number regarding the Health Facility where the vaccination will be provided and the scheduled time for the same. This will be done to avoid any inconvenience in registration and vaccination of beneficiaries.</p>
11.	Can a person get the COVID-19 vaccine without registration with Health Department?	No, registration of beneficiary is mandatory for vaccination for COVID 19. Only after registration the information on the session site to visit and time will be shared with the beneficiary.

12.	What documents are required for registration of eligible beneficiary?	<p>Any of the below mentioned ID with Photo may be produced at the time of registration:</p> <ul style="list-style-type: none"> • Aadhar Card • Driving License • Health Insurance Smart Card issued under the scheme of Ministry of Labour • Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) Job Card • Official identity cards issued to MPs/MLAs/MLCs • PAN Card • Passbooks issued by Bank/Post Office • Passport • Pension Document • Service Identity Card with photograph issued to employees by Central/ State Govt./ PSUs/Public Limited Companies • Voter ID • Smart card issued by RGI under NPR
13.	Will a Photo / ID be required at the time of registration?	The Photo ID produced at the time of registration must be produced and verified at the time of vaccination.
14.	If a person is not able to produce Photo ID at the session site, whether s/he be vaccinated or not?	Photo ID is a must for both registration and verification of beneficiary at session site to ensure that the intended person is vaccinated.
15.	How will the beneficiary receive information about due date of vaccination?	Following online registration, beneficiary will receive SMS on their registered mobile number on the due date, place and time of vaccination.

16.	Will vaccinated beneficiaries receive information on the status of their vaccination after completion?	<p>Yes. On getting due dose of COVID 19 vaccine, the beneficiary will receive SMS on their registered mobile number.</p> <p>After all doses of vaccine are administered, a QR code based certificate will also be sent to the registered mobile number of the beneficiary.</p>
17.	If one is taking medicines for illnesses like Cancer, Diabetes, Hypertension etc, can s/he take the COVID-19 vaccine?	Yes. Persons with one or more of these comorbid conditions are considered high risk category. They need to get COVID -19 vaccination.
18.	Are there any preventive measures and precautions that one needs to follow at the session site?	<p>We request you to rest at the vaccination centre for atleast half an hour after taking the COVID-19 vaccine. Inform the nearest health authorities / ANM / ASHA in case you feel any discomfort or uneasiness subsequently.</p> <p>Remember to continue following key COVID Appropriate Behaviours like wearing of mask, maintaining hand sanitization and physical distance (or 6 feet or Do Gaj).</p>
19.	What about the possible side-effects from COVID-19 vaccine?	<p>COVID Vaccine will be introduced only when the safety is proven. As is true for other vaccines, the common side effects in some individuals could be mild fever, pain, etc. at the site of injection.</p> <p>States have been asked to start making arrangements to deal with any Covid-19 vaccine-related side-effects as one of the measures towards safe vaccine delivery among masses.</p>

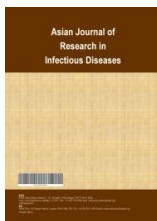
20.	How many doses of the vaccine would have to be taken by me and at what interval?	Two doses of vaccine, 28 days apart, need to be taken by an individual to complete the vaccination schedule.
21.	When would antibodies develop? After taking first dose, after taking second dose, or much later?	Protective levels of antibodies are generally developed two weeks after receiving the 2 nd dose of COVID-19 vaccine.

Frequently Asked Questions on COVID-19 Vaccine

Target Group: Healthcare providers / Frontline workers

	Question	Potential response
1.	Why am I being chosen for COVID 19 vaccine?	Government of India has prioritised the most at risk/high risk groups which will get the vaccine first. Healthcare providers have led the battle against COVID 19 from the front. The government wants you to be able to continue your work, without the fear of risk associated with the virus. Therefore, healthcare and frontline workers are among the first group of people to be vaccinated in the country.
2.	What are the groups to be vaccinated in the first phase?	<p>Based on the potential availability of vaccines the Government of India has selected the priority groups who will be vaccinated on priority as they are at higher risk.</p> <p>The first group includes healthcare workers because they are at high risk of contracting the infection and protecting them helps to sustain essential health services. The vaccination of frontline workers will help in reducing the societal and economic impact by reducing COVID-19 mortalities. The next group to receive COVID 19 vaccine will be persons over 50 years of age and persons under 50 years with comorbid conditions because there is high mortality in this category.</p> <p>The reason for including more than 50 years of age group for vaccination is that it will be able to cover 78% of persons having co-morbidities and thereby reduce mortality on account of COVID-19.</p>

		<p>More than 50 years of age group is divided into two sub groups. One sub group is 60 years and above, they will be vaccinated first. Second sub-group is between 50 to 60 years age group, they will be vaccinated after the first sub group is covered.</p> <p>The vaccination may not be sequential. It can go in parallel for all beneficiaries depending on the availability of the vaccine.</p>
3.	Will my family members also be given the vaccine?	Due to the limited vaccine supply in the initial phase, it will first be provided to people who are at higher risk of contracting COVID-19. In subsequent phases the COVID 19 vaccine will be made available to all others in need of the same.
4.	Is this vaccine safe?	Yes. Safety and efficacy of vaccine will be ensured through various phases of vaccine trials and only then a vaccine will be introduced.
5.	Does one need to follow preventive measures such as wearing a mask, hand sanitization, social distancing after receiving the COVID 19 vaccine?	Even after receiving the COVID 19 vaccine, we must continue taking all precautions like use of face cover or masks, hand sanitization and maintain distancing (6 feet or Do Gaj). These behaviours must be followed both at the session site and in general.
6.	Are there any common side-effects of this vaccine?	The COVID 19 vaccine will be safe and effective but may have minor side effects like fever, pain, etc. at the injection site. These effects can happen in any vaccine.



Spread of Corona Virus Disease (COVID – 19) from an Outbreak to Pandemic in the Year 2020

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Authors' contributions

This work was carried out in collaboration among all authors. Author MGA designed the study, wrote the protocol, managed the analyses of the study and wrote the first draft of the manuscript. Authors MGA, MOA and SNH managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Aims: The COVID-19 is most recently discovered of the corona viruses which caused respiratory infections consisting of two large scale pandemics MERS & SARS and found to be zoonotic in origin. The disease started from Wuhan local seafood market in China and infected 2,761 people. The 2019-nCoV virus isolated from the bronchoalveolar lavage fluid of critically ill patients and has shown it 96% identical to bat coronavirus and bearing same cell entry receptor angiotensin converting enzyme II (ACE2). Corona means crown in Latin and it look like a crown under a microscope. Corona virus disease is an infectious disease where most infected people suffered from mild to moderate respiratory illness and recover without requiring special treatment however older people and those with underlying medical problems develop serious illness and can be prevented by washing the hands or using an alcohol based rub and not touching the face. Outbreak is small but unusual; the epidemic is outbreak over a larger geographic area while pandemic spreads to multiple countries.

Methodology: The duration of review for spread of COVID-19 was between 31st December 2019 to 11th March 2020. The 31st December 2019 was the reporting of first case of Corona Virus

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(COVID-19) by the China while 11th March was declaration date of Pandemic by the World Health Organization (WHO). A total of 70 papers consisting of research article, review papers and news reports has been studied and evaluated.

Results: China on 31 December 2019 first informed about COVID-19 and WHO declared on 11 March 2020 that COVID-19 can be characterized as a pandemic. Scientists suspected that corona virus originated in a bat and before passing to human hopped to another animal. Thailand, Japan, USA, France, Australia, Germany, Italy and Spain reported their first case on 13, 16, 19, 24, 25, 27, 31 and 31 January 2020. In February the cases reported by Belgium, Egypt, Iran, Brazil, Pakistan, Netherland, England and Ireland on 4, 14, 19, 25, 26, 27, 28, 29 while in March cases seen in Saudi Arabia, South Africa, Peru and Turkey on 2, 5, 6 and 10 respectively. WHO on 11 March 2020 assessed the outbreak as a pandemic with 114 affected countries.

Conclusions: The spread of disease as a pandemic occurred due to movement of carriers outside China. Strict quarantine needed to prevent spread of disease. The code of ethics for social distancing should be defined and strictly implemented. Selling, buying and eating of wildlife animals should be internationally banned.

Keywords: Bat; intermediate host; COVID-19; outbreak; quarantine; pandemic.

1. INTRODUCTION

A COVID-19 is most recently discovered of the corona viruses which caused respiratory infections such as MERS (Middle East Respiratory Syndrome) and SARS (Severe Acute Respiratory Syndrome) [1]. The disease started from Wuhan local sea food market in China and infected 2,761 people in China with 80 deaths and infection of 33 people in 10 additional countries as on 26th January 2020. Full length genome sequences from five patients have shared 79.6% sequence identity to SARS-CoV. It was seen that 2019-nCoV is 96% identical at genome level to a bat corona virus. The virus isolated from the bronchoalveolar lavage fluid of a critically ill patient could be neutralized by sera from several patients [2]. The Corona Virus Study Group of the International Committee on Taxonomy of Viruses has proposed this virus as a sister to severe acute respiratory syndrome corona viruses (SARS-CoVs) and designates it as severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) [3]. Corona means crown in Latin and it look like a crown under a microscope. At first it was 'novel corona virus' which means a new strain of corona virus. Once scientists figured out exactly was given the name as SARS-CoV-2. It has been identified in 2019 and for simplicity got the same name as COVID-19 [4]. The two strains severe acute respiratory syndrome corona virus and middle east respiratory syndrome corona virus are also zoonotic in origin and linked for fatal illness where SARS-CoV was the causal agent of the severe acute respiratory syndrome outbreaks in 2002 and 2003 in Guangdong Province China and MERS-CoV was the pathogen responsible

for severe respiratory disease outbreaks in 2012 in Middle East [5]. Corona virus disease (COVID-19) is an infectious disease where most infected people suffered from mild to moderate respiratory illness and recover without requiring special treatment however older people and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease and cancer are more likely to develop serious illness. The COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes so it is important to follow the practice respiratory etiquette (e.g., coughing into a flexed elbow) [6]. An epidemic has been defined as an outbreak of a disease that occurs over a wide geographic area and affects an exceptionally high proportion of the population where as pandemic relates to geographic spread and used to describe a disease that affects a whole country or the entire world [7]. Outbreak is small but unusual. The cluster of pneumonia cases that sprung up unexpectedly among market goers in Wuhan where China and public health authorities detected an outbreak spike of pneumonia cases. As an emergence of new disease the outbreak got more noticeable since anticipated numbers of illnesses caused by that disease was zero. As an epidemic the outbreak over a larger geographic area where people in places outside of Wuhan began testing positive for infection with SARS-CoV-2. It was an indication for epidemiologists that outbreak was spreading and was a likely sign that containment efforts were insufficient or came too late which were not unexpected as no treatment or vaccine was yet available. COVID-19 become pandemic when it became international

and out of control and epidemic spreads to multiple countries or regions of the world [8]. Few of the biggest pandemics in history have been Black Death, Spanish Flu, HIV/AIDS etc [9]. On 31st December 2019 WHO has been first informed about “pneumonia of unknown cause” by the China [1] and WHO on 11th March 2020 assessed the outbreak as pandemic [10].

2. ORIGIN AND TRANSMISSION OF CORONA VIRUS TO HUMAN

Scientists suspected that corona virus SARS-CoV-2 originated in a bat and then hopped to another animal which is possibly the pangolin and then passed to humans. The disease has then been spreading between people without any intermediate animal [11]. Wet markets put people and live/dead animals e.g. dogs, chickens, pigs, snakes, civets and more where close contact of human and animal exist. That makes it easy for zoonotic diseases to jump from animals to humans. According to virologists the bats and birds are considered reservoir species for viruses with pandemic potential. Bats can pass viruses in their poop and if they drop feces on to a piece of fruit that a civet then eats the civet can become carrier. Since these viruses have not been circulating in humans earlier therefore specific immunity to these viruses is absent in humans [12]. According to one report bats has not been sold at Wuhan market where virus is believed to have originated and it is likely another animal which was sold there got infected and transmitted the disease. In this instance it is assumed that bats infected an intermediary host that served as an immediate source for the human infection [13] however according to other report of livemint bats, pangolins and dogs were

sold in wet market [14]. Although initial speculation pointed to sea food, snakes etc however researchers from Hong Kong, China and Australia have found that genetic sequences of the novel corona virus in pangolins are 85.5% to 92.4% identical to the corona virus which is currently infecting hundreds of thousands of people. That means before reaching to humans the virus likely passed from bats to the pangolin [15] (Fig. 1). According to one hypothesis the interaction between the receptor binding domain (RBD) of the corona virus spike protein and the host receptor angiotensin converting enzyme 2 (ACE2) controls disease transmission in SARS and COVID-19. The spike protein grabs hold of ACE2 on host cells to gain entry into cells where it replicates, bursts open the cell, and spreads to other cells. The ACE2 receptor proteins belonging to different species e.g. pigs, ferrets, cats, orangutans, monkeys, at least some species of bats, civets and humans which have shown similar levels of affinity for SARS-CoV-2 based on the structural similarity of their ACE2 receptors [16]. According to WHO ecological reservoirs for SARS-CoV-2 are bats and intermediate animal host could be a domestic food animal, a wild animal, or a domesticated wild animal which has not yet been identified. Corona viruses are very stable in a frozen state and shown survival for up to two years at -20°C. Since virus is found to be stable at low and freezing temperatures for a certain period therefore food hygiene and good food safety practices can prevent their transmission through food. Specifically corona viruses are thermo labile which means that they are susceptible to normal cooking temperatures (70°C). Therefore consumption of raw milk, raw or undercooked

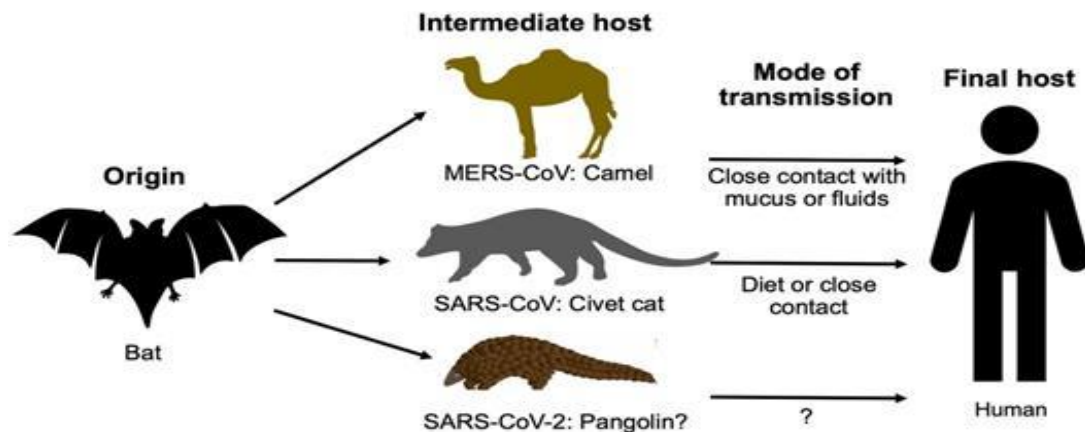


Fig. 1. Mode of transmission from animals to human

animal products should be avoided [17]. The incubation period is time from exposure to the causative agent until the first symptoms develop and is characteristic for each disease agent [18]. According to World Health Organization (WHO) the COVID-19 has incubation period between 2 and 10 days [19] however China National Health Commission (NHC) has estimated an incubation period from 10 to 14 days whereas the United States CDC estimates the incubation period for COVID-19 to be between 2 and 14 days [20]. Carrier is a person or animal that harbors a specific infectious agent without discernible clinical disease and serves as a potential source of infection. The carrier state may exist during incubation period, convalescence and post convalescence of an individual with a clinically recognizable disease (commonly known as an incubatory or convalescent carrier) which can be of short or long duration (temporary or transient carrier, or chronic carrier). Mostly it has been the carrier state where most of the spread of the disease occur resulting from an outbreak to pandemic [21].

3. GLOBAL PANDEMICS

The history of pandemics is not new and they date back to years and years resulting to affect huge population in all continents of the world and deaths of millions of people.

The Plague has a long history in the European continent where evidence of the disease date back to Stone Age. Plague epidemics in Europe during the first (sixth to eighth centuries) and second pandemics (fourteen to nineteenth centuries) including the Black Death (1346–1353) are infamous for their widespread mortality and lasting social and economic impact. The third plague pandemic originated in the Yunnan region of southwest China where plague caused multiple outbreaks since 1772. In the nineteenth century third pandemic spread globally and affected the Europe [22].

In the whole of the 20th century it was believed that Black Death and all the plagues of Europe (1347–1670) were epidemics of bubonic plague. Black Death was named in 1823 because of the black blotches caused by subcutaneous hemorrhages which appeared on the skin of victims [23].

The Spanish influenza pandemic also labeled as mother of all pandemic and an estimated one third of the world's population (or =500 million

persons) were infected during 1918–1919 influenza pandemic. The disease was exceptionally severe and case fatality rates were >2.5% compared to <0.1% in other influenza pandemics. Total deaths were estimated at =50 million and were arguably as high as 100 million [24].

The bacterium vibrio cholerae is the causative agent of cholera which caused severe and potentially life threatening diarrheal disease which is of considerable public health concern because of its high morbidity and mortality. There have been seven cholera pandemics since 1817 and all continents except Antarctica have had significant or major incursions by one or more of them [25].

Many writers have dwelt on shifting the incidence and mortality of smallpox from childhood to adult life in first half of the nineteenth century where the epidemic of 1837-41 being last to show a preponderating proportion of deaths among infants and young children. It was generally found that change in age incidence was due to a better enforcement of vaccination in early life. Those countries where vaccination was not compulsory the infantile mortality from smallpox during the pandemic was much higher than in those in which vaccination was more or strictly enforced [26].

Since the beginning of epidemic 75 million people have been infected with the HIV virus and about 32 million people have died of HIV. Globally 37.9 million (32.7–44.0 million) people were living with HIV at the end of 2018. An estimated 0.8% (0.6-0.9%) of adults aged 15–49 years worldwide is living with HIV although burden of the epidemic continues to vary considerably between countries and regions. The WHO African region remains most severely affected with nearly 1 in every 25 adults (3.9%) living with HIV and accounting for more than two-thirds of the people living with HIV worldwide [27].

4. METHODOLOGY

The review has been carried on the spread of Corona Virus Disease (COVID-19) from outbreak to pandemic where disease was initiated in Wuhan China in the shape of an outbreak and afterward spread globally all over the world. The duration of review was between 31st December 2019 to 11th March 2020. The 31st December 2019 was the reporting of first case of Corona

Virus (COVID-19) by the China while 11th March 2020 was the declaration date of Pandemic by the World Health Organization (WHO). The data for review has been collected from literature and reporting of the first case by country. A total of 70 papers consisting of research article, review papers and news reports has been studied and analyzed and then evaluated.

5. RESULTS

The corona virus disease was reported by the China where it was found that Pneumonia cases were detected in Wuhan city of China and same disease spread globally resulted in declaration by WHO as a pandemic.

5.1 First Corona Virus Disease Case (December - 2019) in Wuhan City by the China

On 31st December 2019 WHO has been first informed by the Chinese authorities that “a pneumonia of unknown cause” had been detected in Wuhan which is the largest city in Hubei province in central China. The COVID-19 is most recently discovered of corona viruses which have caused respiratory infections such as MERS and SARS¹.

5.2 Spread of Corona Virus Disease (COVID-19) in January 2020

On 13th January 2020 Thailand reported the first imported case of lab confirmed novel corona virus (2019-nCoV) from Wuhan Hubei Province China. The case was a 61 year old Chinese woman living in Wuhan City Hubei Province China. On 8th January 2020 she took a direct flight to Thailand from Wuhan city together with five family members and was reported to have history of visiting a local fresh market in Wuhan on regular basis prior to onset of illness [28].

Japan confirmed its first case of infection on 16th January 2020 from Wuhan pneumonia like virus and they isolated two visitors from the Chinese city as a preventive measure. It was found that Chinese national had been in close contact with a patient when he was in Wuhan however none of his family members who live with him in neither Japan nor the doctors who treated him have tested positive for the virus. The Wuhan outbreak coincides with the annual flu season in Japan and it was advised for people to wash their hands, gargle and wear masks to avoid falling sick [29].

The United States first case of 2019-nCoV infection was reported on 20th January 2020 where on 19th January 2020 a 35 years old man presented to an urgent care clinic in Snohomish country Washington with a 4 days history of cough and subjective fever. It was disclosed by him that he had returned to Washington State on January 15, 2020 after traveling to Wuhan China. The patient stated that he had seen a health alert from U.S. Centers for Disease Control and Prevention (CDC) about novel corona virus outbreak in China and because of his symptoms and recent travel decided to see a health care provider [30].

France has declared first confirmed cases of the deadly corona virus on 24th January 2020 where one case of the virus had been confirmed in Bordeaux while the second found near Paris marking the first confirmed cases of the novel virus in Europe. It was found that both of the initial cases had travel history to China [31].

It has been on 25th January 2020 when Australia first case of novel corona virus (2019-nCoV) has been confirmed by Victoria Health Authorities. It was found that the patient was a man from Wuhan who flew to Melbourne from Guangdong on 19 January 2020 [32].

The first human to human transmission of the Wuhan corona virus has been reported in Germany on 27th January 2020 where a man was infected by a colleague who had been in China and experts said that the Chinese woman who originally had the virus apparently had no symptoms when she transmitted it to her colleague. There have been warnings from inside China that people may be infectious before they start to feel ill. The 33 year old man who has been infected had not visited China but a Chinese colleague who visited Germany gave a training session on 21st January 2020 and man who had attended the session tested positive for virus. It was found that she have recently visited her parents in Wuhan [33].

On 31st January 2020 the Italian Government announced to suspend all flights between Italy and China with declaration of emergency in the country when doctors confirmed two Chinese tourists in Rome had tested positive for the coronavirus [34].

The corona virus pandemic was confirmed to have spread to Spain on 31st January 2020 when a German tourist tested positive for SARS-CoV-2

in La Gomera Canary Islands. The National Microbiology Center (CNM) reported a positive test from an individual in the Canary Islands. The patient was a German national treated at Nuestra Señora de Guadalupe Hospital in the town of San Sebastián where he has been placed in isolation [35].

5.3 Spread of Corona Virus Disease (COVID-19) in February 2020

The Belgium reported first case of COVID-19 on 4th February 2020 when nine repatriated Belgians came from Wuhan and tested at the Military Hospital in the Brussels and one of them found to be infected with the novel corona virus [36].

Egypt announced and reported first confirmed COVID-19 case on 14th February 2020. It was found and reported that the patient was a foreigners [37].

The Iran has first reporting of the disease when two deaths occurred on 19th February 2020. It was suspected that the carrier of the virus may have been a merchant who travelled between Qom and Wuhan in China where COVID-19 have originated. It was also estimated that outbreak might have begun between three and six weeks ago which would mean that two died could have been sick and infecting others for weeks [38].

The Brazil confirmed their first case of a fast spreading new corona virus disease on 25th February 2020 in Latin America when a 61 years old man in Sao Paulo returned recently from Italy. Brazil's first confirmed patient had traveled to Lombardy in the northern Italy from 9th February to 21st February 2020 and had symptoms compatible with the disease [39].

On 26th February 2020 a young man tested positive for the corona virus in Pakistan. The 22 years old male patient travelled to Iran where he probably acquired COVID-19. The patient travelled from Iran to Karachi by plane on 20th February 2020. The patient with his family has been placed in quarantine at the Aga Khan University Hospital Karachi [40].

The Netherland reported first case of corona virus disease (COVID - 19) on 27th February 2020 when a 56 years old Dutch person traveled to the Lombardy region of Italy and was tested at the Elisabeth-TweeSteden hospital in Tilburg.

The said person was placed in quarantine by the authorities [41].

The first patient was diagnosed with corona virus in England on 28th February 2020 however it was unclear whether this was directly or indirectly from someone who recently returned from abroad. The man was a resident of Surrey who had not been abroad recently himself [42].

On 29th February 2020 first case of the corona virus (COVID-19) in Ireland was confirmed in Dublin. It was found that the patient was a school student who had recently returned from Italy [43].

5.4 Spread of Corona Virus Disease (COVID-19) in March 2020

Saudi Arabia reported first case of the new corona virus on 2nd March 2020 virus. According to report by that time the virus has reached in 66 countries of the world. The Saudi patient traveled from Iran via Bahrain over the King Fahad Causeway [44].

First case of Covid-19 Corona virus reported in South Africa has been found on 5th March 2020 where National Institute for Communicable Diseases confirmed a suspected case of COVID-19 found positive. The patient was a 38 year old male who found to have travelled history to Italy with his wife [45].

Peru recorded first confirmed case of corona virus 6th March 2020 when 25 years old man who had traveled to Spain, France and the Czech Republic. The patient was found to be suffering with disease resulting in spread around South America [46].

Turkey reported first corona virus case on 10th March 2020 where it was found that the afflicted person was a Turkish male who had been immediately put in isolation and that the person was contracted the virus while traveling to Europe [47].

5.5 Declaration as Pandemic by the WHO

According to WHO on 11th March 2020 the number of COVID-19 cases outside China has increased 13-fold and number of affected countries has tripled. Thousands more patients are fighting for their lives in hospitals. WHO has assessed the outbreak as alarming and that COVID-19 can be characterized as a pandemic. By that time there were more than 1,18,000

cases in 114 countries and 4,291 people have lost their lives [10] (Fig. 2).

5.6 Core Cause for Spread of COVID-19; Movement outside the Affected Areas

The review has shown that spread of corona virus disease (COVID-19) occurred due to movement of nationals outside the affected area of Wuhan Hubei China. It has been seen that first diagnosed case of COVID-19 in different countries were either found to have a recent travel history from Wuhan Hubei or the affected country which earlier got the disease due to travel of infected person from China. Afterward due to spread of disease from multiple countries

the number of affected persons and counties has shown swift increase leading the incidence as being conversion from an outbreak to pandemic.

5.7 Global Lock Down

The corona virus which started from Wuhan, Hubei China and spread globally in short span of time. On account of increase in number of reported cases and subsequent deaths an almost complete lock down was made globally in all continents of the world with suspension of all social, economical etc activities except vital provision of food and health required for life (Fig. 3).



Fig. 2. Global spread of Corona Virus Disease (COVID-19)



Fig. 3. Global lock down

5.8 Corona Virus (COVID-19) Pandemic 2020

Like earlier pandemic since Stone Age the COVID-19 has shown to affect millions of people with result of thousands of deaths. The pandemic has widespread social and economic impact in almost all continent of the world. This was not the first outbreak in 21st century where SARS (2002), Swine Flu (2009), MERS (2012), Ebola Virus (2014) etc happened. It has been seen that maximum mortalities has been seen in deceased at higher age group. Like earlier as seen in number of outbreaks the disease started as zoonotic origin in bat and involved intermediate host and drawn attention toward wet markets.

The remedies consisting of strict quarantine, implementing immunization(after its preparation), reducing influx of unvaccinated refugees, reduction of ongoing global wars, control of political insurgency, security issues, adequate awareness of health care professionals regarding vaccination schedule, proper training , self vaccination of health care professionals, reduction of corruption etc would result in reduction of casualties all over world [48].

A global pandemic is all over but there are many unknowns and as earlier giving a message in almost all countries to work on the source and causes which have resulted in the shape of a bigger catastrophe in the world.

5.9 Treatment/Therapies for Corona Virus Disease (COVID-19)

According to WHO there is no vaccine for COVID-19 however it may take a number of years for a new vaccine to be developed for prevention of the disease [49].

The WHO has recommended avoiding close contact with people suffering from acute respiratory infections. It was advised to use mask, do frequent hand washing, especially after direct contact with ill people or their environment. For prevention of disease there should be avoiding of unprotected contact with farm or wild animals. People with symptoms of acute respiratory infection should practice cough etiquette (maintain distance, cover coughs and sneezes with disposable tissues or clothing, and wash hands). The healthcare facilities should enhance standard infection prevention and control practices in hospitals especially in

emergency departments [50]. There should be washing of hands or using an alcohol based rub frequently and not touching the face [6].

Hydroxychloroquine and chloroquine have been used for prevention and hospitalized COVID-19 patients. It has also been fast-tracked through clinical trials to determine its efficacy in the treatment of COVID-19. The use of chloroquine as prevention/cure has been utilized to limit the spread of 2019-nCoV pandemic [51].

6. DISCUSSION

The Chinese authorities introduced unprecedented measures to contain the virus by stopping movement in and out of Wuhan and limiting more than 60 million people to the homes. Flights and trains were suspended and roads were blocked. The people in many Chinese cities were also told to stay at home and venture out only to get food or medical help. According to New York Times some 760 million people which is roughly half the country's population were confined to their homes [52].

According to Chinese Authorities Wuhan the provincial capital and city hardest hit by virus was sealed off until 8th April 2020 which means after reporting of first case they have quarantined Wuhan city for more than three months [53].

The new virus sweeping the world is believed to have started in a "wet market" in Wuhan China where like many other markets in Asia bats, snakes, civets and other animals are tied up or stacked in cages. Many are killed on-site to ensure freshness which is highly valued in Chinese culture and cuisine. According to health experts the markets are considered breeding grounds for new and dangerous infections because of close contact between humans and live exotic animals which makes it easier for viruses to jump between species. It is believed SARS originated from the same type of market and COVID-19 also spreads throughout China and widely crossed the borders [54].

In the past century five influenza pandemics had occurred (1918 "Spanish flu", 1957 "Asian flu", 1968 "Hong Kong flu", 1977 "Russian flu" and 2009 H1N1 Pandemic) which accounted for hundreds of millions of people infected and tens of millions dead. The China was influenced by all the five pandemics, and three of them (1957

"Asian flu", 1968 "Hong Kong flu" and 1977 "Russian flu") were originated from China. The previous history of Pandemics due to viral disease indicate risk of infection of COVID-19 not only in the China but as well as in other countries of the world [55].

Siddharth Chandra said that the estimates about of deaths from the influenza pandemic of 1918–19 in Japan range from 257,000 to 481,000 with resulting crude death rate range of 0.47%–0.88% and found as considerably lower than worldwide estimates of 1.66%–2.77%. In agreeing with Siddharth about Japan for control of disease it looks that the Japan is maintaining similar approach for prevention where they have detected first case during screening as a preventive measure in the beginning period of pandemic [56].

Alexandra et.al in an editorial about Pandemic in the United States drawn toward role of both private citizens and uniformed personnel; for households, communities, work forces, volunteer organizations, and professional organizations; and for traditional governance structures at the local, state, and federal levels. In agreeing with Alexandra the vital role of all corner of community can't be ignored for control of disease [57].

The Local (fr) in the article Black Death to Spanish Flu stated diseases have shaped French history and since then in the 21st century advances occurred in microbiology and virology as well as an understanding of how disease spreads expects that it would be extremely difficult for a plague to rage as widely and wildly as the Black Death or at least at the same level of lethality. In continuation of epidemic we agreeing partially about reduced level of lethality however in spite of sufficient advancement in microbiology and virology yet the Pandemic of COVID-19 have not only occurred but as well as spread globally which indicate to search factors beyond microbiology and virology for controlling the occurrence of epidemic/pandemic disease [58].

The Health Department of Australia in their update about history of pandemics stated influenza pandemic of 1957-58 arose by genetic reassortment of a bird virus. Similarly studies showed that in 1968-70 pandemic or Hong Kong flu also occurred by genetic reassortment. In agreeing with the Health Department studies are needed to be carried out not only for control of

the corona virus disease but as well as to detect genetic reassortment for control of disease [59].

German Lopez in the Vox stated about lessons on social distancing from 1918 Spanish flu pandemic and recommended that quick actions are needed to be taken and interventions should be sustained until the virus truly goes away. It was also emphasized to sustain the social distancing practices which could required for months as it is necessarily required to save as many lives as possible. The role of leadership in control of epidemic/pandemic can be judged from lessons in 1918 where in Pennsylvania the mayors of Philadelphia and Pittsburgh were fighting with the governor and the governor was fighting with the state health commissioner. In the same year there were some cities that had really good leaders and they had really good health commissioners who worked well with mayors and worked well with the superintendent of schools and police force and then there were others that were really bad. All this indicate that in addition to social distancing whole of the community including leadership should function as a single unit to compete the pandemic [60].

Guido Alfani stated in European Review of Economic History about Plague in seventeenth century Europe and decline of Italy where it was concluded that plague greatly contributed to relative economic decline of Italy and set an agenda for investigating fully the economic consequences of the epidemics. In agreeing to Alfani whereas Italy is one of the most affected countries in the world due to COVID-19 the economic consequences are needed to be investigated globally with appropriate remedies for recovery of the survivors [61].

We agree with David et.al who in their study of Spanish flu (1918) gave an insight for the 21st century that the most difficult challenge would probably not be to increase medical knowledge about treatment and prevention but to increase medical capacity, resource availability (e.g., hospital beds, medical personnel, drugs, and supplies), public health and community crisis responses to an event in which 25–50% of the population could fall ill during a few weeks time. Health care systems could be rapidly overwhelmed by the sheer volume of cases where ensuring production and delivery of sufficient quantities of antiviral, vaccines, antibiotics, widespread access to medications and medical care particularly to impoverished

regions would be a sobering challenge since supply chain of necessary medications and equipment for medical care could easily be disrupted by global public health catastrophe [62].

Azizi et.al in their study about History of Cholera Outbreaks in Iran during the 19th and 20th Centuries concluded that several Persian books were written on cholera by Iranian and European physicians in Iran during the 19th and 20th centuries. The oldest book was entitled 'Wabbayeh' (Cholera) written by an Iranian author named Mirza Mohammad Tabib Tehrani which dated back to 1858. Among European physicians Dr. Jacob Eduard Polak (1818-1891) from Austria who was the first medical teacher of Dar al-Fonun School (founded in 1851) wrote a treatise on cholera (Resaly-e Wabbayeh) which was published by Dar al-Fonun Press in 1852. The Pandemic of corona virus disease (COVID-19) after killing thousands of people globally would be most probably over following which as earlier books and articles would have been written with numerous conclusions and failure in implementing the remedies of conclusion can't stop the happening of next pandemic in the world [63].

Mazhar Hussain in their article stated about Pakistan's preparedness for corona virus pandemic. It was emphasized that Pakistan has unenviable task of ensuring its public health system which is already under resourced and overburdened where it should be urgently strengthened to tackle the rapidly expanding pandemic. In this regards three steps consisting of ensure adequate availability of diagnostics and effective screening, take adequate preventive measures and develop capacity for timely regulatory approvals and stockpiling for drugs/vaccines are urgently required to be taken in competing the risk COVID-19 pandemic in Pakistan [64].

Philips in their article said that issue of repatriation of foreign nationals from China grabs a headlines in South Africa and elsewhere on the continent in the wake of the spread of Covid-19 about important lessons that needed to be drawn from events 102 years ago in 1918 when an earlier epidemic called Spanish flu arrived in the country. That was most devastating pandemic of modern times killing more than 50 million people around the world (or 3% to 4% of the globe's population) in just more than a year. About 300000 South Africans died within six

weeks which represented 6% of the entire population. Certainly the world is a very different place in 2020 not least in the speed of international travel compared to that in steamship era of 1918 however the ways in which viruses behave and humans respond have not changed as much. Therefore still important lessons needed to be learnt from the catastrophe from 1918 to 2020 [65].

According to Massimi Galli "Italy is a country of old people" and therefore the elderly with previous pathologies are notoriously at higher risk. The higher age with weaker immune system has been the probable reason for more serious cases of corona virus in the Italy [66].

It has been on 18th February 2020 where a fit 38 year old with no apparent links to China fell ill in Codogno. He saw his GP and visited his local hospital several times but his symptoms were not picked up as resulting from the corona virus. The patient was finally admitted to hospital where he was tested after a 36 hour delay which he spent outside isolation. It can be judged that by that time he had infected a number of medical personnel and other contacts over a period of days [66].

According to Berna Arda et.al the pandemic is reported to spread in three waves, A moderate but fairly spreading occurrence in spring 1918 then an utterly severe and devastating attack in fall 1918 and finally a last attack in spring 1919. The last wave was more severe than the first wave but not as devastating as second phase. This indicate that after settlement of acute phase still there would be risk of disease and proper preventive measures should be continued to prevent relapse of the disease [67].

BCG vaccination has shown broad protection to respiratory infections. It is found that those countries without universal policies of BCG vaccination (Italy, Nederland, USA) have been more severely affected compared to countries with universal and long-standing BCG policies. It has been observed that countries where late start of universal BCG policy (Iran-1984) was implemented they have high mortality indicating the idea that BCG protects the vaccinated elderly population. Since BCG vaccination observed reduced number of reported COVID-19 cases in a country therefore reduced morbidity and mortality suggest BCG vaccination as a potential new tool in fight against COVID-19 however it may need clinical trials for final conclusion [68].

The novel corona virus outbreak presents an immense challenge for global health. But it is also part of a larger pattern that viruses circulate in animals keep jumping over to infect humans. The story of the novel corona virus is the story of HIV, of SARS, of Ebola, and even the measles. These are all diseases that have been introduced to humans with deadly effects via animals. And as humans encroach more and more into animal habitats it is believed that these spillover events may grow more common [69].

The countries introduced unprecedented measures to stem the spread of the new corona virus. One of the most alarming conclusions from infectious disease modelling is that there is no clear exit strategy. We can see from China and South Korea where a combination of community surveillance, testing and contact tracing, strong social distancing and rapid clinical care, reduced infections and deaths. But we don't know how long these measures should last or whether relaxing them will allow the virus to undergo resurgence [70].

7. CONCLUSION

The spread of disease as a pandemic occurred due to movement of carriers outside China which ultimately became source of global spread. Strict quarantine measure should be maintained to avoid spread of infectious disease. Early and appropriate preventive measures should be opted after outbreak/epidemic to prevent spread of disease. The vital role of community as a whole is required to control the epidemic/pandemic disease. Beyond personal/political differences the leadership at every level should be committed to compete and manage the global crisis for the world. The code of ethics for social distancing should be defined and strictly implemented. Appropriate economic remedies should be made after survivors of pandemic globally. Selling, buying and eating of wildlife animals should be internationally banned. The genetic reassortment of COVID-19 should be worked to prevent any pandemic due to same virus in future. In order to manage global public health catastrophe the health authorities should make system in cold days which is reserved sufficiently for provision of chain about necessary medications and equipment to manage the crisis. The settlement of corona disease may take a longer time therefore preventive measures should be continued after settlement of acute of the disease.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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