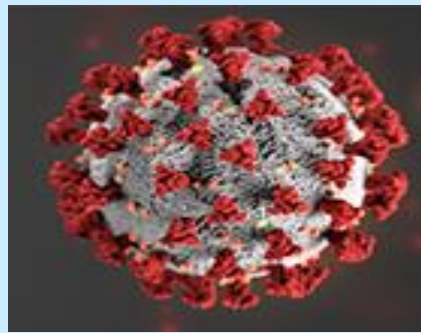




**Booklet**  
on  
**Corona Virus Disease (COVID-19)**



**Prepared by**

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## INTRODUCTION

- Corona virus disease-19 (COVID-19) is an infectious disease caused by a newly discovered corona virus (CoV).
- This epidemic emerged in December 2019 in Wuhan City, Hubei Province, China. COVID-19 is now a pandemic affecting many countries globally.
- Epidemiological investigations revealed that many initial patients were exposed to wildlife at the Huanan seafood wholesale market, which is the largest seafood market in central China, and where different species of bats, minks, snakes, Chinese bamboo rats, cats, porcupines, dogs, poultry and other farm animals are commonly sold. These markets are known as ‘wet markets’ since these are traditionally places that sold dead and live animals out in the open where blood and other body fluids originating from different animal species represent an exceptional source for the spread of infectious diseases and the jump of species barriers by pathogens.
- The evidence that SARS-CoV and MERS-CoV were transmitted directly to humans from masked palm civets (*Paguma larvata*) and dromedary camels, both viruses are thought to have originated in bats led to the hypothesis that COVID-19 may be of animal origin.
- Researchers in Guangzhou, China, have suggested that pangolins, long snouted, ant-eating mammals often used in traditional Chinese medicine, are the probable direct animal source of COVID-19 for humans.
- Due to COVID-19, 3525116 confirmed cases, 243540 confirmed deaths were reported till date in 215 countries, areas and territories in the globe.
- In India, till date a total of 31967 active cases, 13160 cured/discharged cases and 1583 deaths were reported.

- The emergence of COVID-19 is paradigmatic of the strict relationship existing between human and animal health, ecosystem condition and human habits.
- The constant spillover of viruses from their natural hosts to humans and other animals is largely due to human activities, including modern agricultural practices and urbanization.
- The most effective way to prevent this viral zoonosis is to maintain the barriers between natural reservoirs and human society, in mind of the ‘One Health’ concept.

## **ETIOLOGY**

### **Humans**

- COVID-19 is the infectious disease caused by the most recently discovered coronavirus. These viruses are a family of RNA viruses. They are called 'CoV' because the virus particle exhibits a characteristic ‘corona’ (crown) of spike proteins around its lipid envelope.
- CoV infections are common in animals and humans. Some strains of CoV are zoonotic, they can be transmitted between animals and humans, but many strains are not zoonotic.
- CoV which causes COVID-19 has been named as SARS-CoV-2 by the International Committee on Taxonomy of Viruses (ICTV).
- CoV can cause illness ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (caused by MERS-CoV), and Severe Acute Respiratory Syndrome (caused by SARS-CoV).

### **Animals**

- Dogs, cats, tiger and minks have tested positive for SARS-CoV-2 in the field setting following close contact with infected humans.

- Detailed investigations have demonstrated that SARS-CoV was transmitted from civets to humans, and MERS-CoV from dromedary camels to humans.

## **TRANSMISSION**

### **Humans:**

- The predominant route of transmission of COVID-19 is from human to human.
- Current evidence suggests that SARS-CoV-2 emerged from an animal source. Genetic sequence data reveals that SARS-CoV-2 is a close relative of other CoV found circulating in Rhinolophus bat (Horseshoe Bat) populations.
- People can catch COVID-19 from others who have the virus. The disease spreads primarily from person to person through small droplets from the nose or mouth, which are expelled when a person with COVID-19 coughs, sneezes, or speaks. These droplets are relatively heavy, do not travel far and quickly sink to the ground. People can catch COVID-19 if they breathe in these droplets from a person infected with the virus. These droplets can land on objects and surfaces around the person such as tables, doorknobs and handrails. People can become infected by touching these objects or surfaces, then touching their eyes, nose or mouth.

### **Animals:**

- There is a possibility for some animals to become infected through close contact with infected humans.
- Several dogs and cats (domestic cats and a tiger) in contact with infected humans have tested positive for COVID-19. Ferrets appear to be susceptible to the infection.
- In experimental conditions, both cats and ferrets were able to transmit infection to other animals of the same species, but there is no evidence that these

animals can transmit the disease to human and play a role in spreading COVID-19.

- Studies are underway to better understand the susceptibility of different animal species to SARS-CoV-2 and to assess infection dynamics in susceptible animal species.
- To date, preliminary findings from studies suggest that poultry and pigs are not susceptible to SARS-CoV-2 infection.
- A four-year-old female Malayan tiger, Nadia from the Bronx Zoo in New York City, has tested positive for the coronavirus. Nadia is believed to be the first known case where transmission of the novel coronavirus from human to an animal has been confirmed according to a *Reuters* report.

## **SYMPTOMS**

### **Humans:**

- Symptoms may appear 2-14 days after exposure to the virus. The disease affects different people in different ways. Most infected people will develop mild to moderate illness and recover without hospitalization. Most common symptoms are fever, dry cough, tiredness.
- **Less common symptoms:** aches and pains, sore throat, diarrhoea, conjunctivitis, headache, loss of taste or smell, a rash on skin, or discolouration of fingers or toes.
- **Serious symptoms:** difficulty breathing or shortness of breath, chest pain or pressure, loss of speech or movement.
- Older people, and those with underlying medical problems like high blood pressure, heart and lung problems, diabetes, or cancer, are at higher risk of developing serious illness.

- Children have similar symptoms to adults and generally have mild illness.

### **Animals:**

- Animal did not show any relevant clinical signs. A four-year-old female Malayan tiger (Nadia ) and six other animals, including lions and tigers were infected with Covid-19 from a zoo-keeper at Bronx Zoo in New York City. A big cat showed symptoms including dry cough after being exposed to the asymptomatic zoo-keeper. The tiger had displayed a loss of appetite amid other signs, including dry cough.
- There have been several reports providing evidence of SARS-CoV-2 infection in household pets. A 17-year-old dog in Hong Kong repeatedly tested "weakly positive" for corona virus in March and later died. The felines showed mild respiratory symptoms and are expected to recover.. A cat in Belgium tested positive for the disease on March 24, 2020.
- Preliminary findings from laboratory studies suggest that, of the animal species investigated so far, cats are the most susceptible species for SARS-CoV-2, and cats can be affected with clinical disease. Cats were able to transmit infection to other cats. Ferrets appear to be susceptible to infection but appear to be less affected by clinical disease and were able to transmit infection to other ferrets.
- Dogs appear to be susceptible to infection but appear to be less affected than ferrets or cats. Egyptian fruit bats were also infected in the laboratory setting but did not show signs of disease. The fruit bats did appear to be able to transmit infection to other fruit bats.

## **DIAGNOSIS**

### **Humans**

- *Clinical suspicion and criteria for testing* : possibility of COVID-19 should be considered primarily in patients with new onset fever and/or respiratory tract symptoms. It should also be considered in patients with severe lower respiratory tract illness without any clear cause.
- *Microbiological diagnosis*: The diagnosis of COVID-19 is made by detection of SARS-CoV-2 RNA by reverse transcription polymerase chain reaction (RT-PCR) assay.
- *Specimen collection* : Upper respiratory samples are the primary specimens for SARS-CoV-2 RT-PCR testing. Collect one of the specimens like nasopharyngeal, oropharyngeal and nasal swabs. Expectoated sputum should be collected from patients with productive cough.
- *Serology to identify prior infection* : Serologic tests detect antibodies to SARS-CoV-2 in the blood. Detectable antibodies generally take several days to weeks to develop with an enzyme-linked immunosorbent assay (ELISA) that detects antibodies to the receptor-binding domain of the spike protein was 12 days for IgM and 14 days for IgG.

### **Animals**

- Limited information is currently available to characterize SARS-CoV-2 infection in animals. Routine testing of animals for SARS-CoV-2 is not recommended.
- Clinical signs more likely to be compatible with SARS-CoV-2 infection in mammalian animals may include a combination of fever, cough, difficulty breathing or shortness of breath, lethargy, sneezing, nasal discharge, vomiting and diarrhea.

- Confirmation by Real-time reverse transcriptase/polymerase chain reaction (RT-PCR) in tracheal washing, throat and nasal swab, and gene sequencing .
- Positive animals should be kept in isolation to avoid contact with other animals and humans.

## **TREATMENT**

### **Humans**

- To date, there is no vaccine and no specific antiviral medicines available against COVID-19.
- People, particularly those with serious illness, may need to be hospitalized so that they can receive life-saving treatment for complications.
- Possible vaccines and some specific drug treatments are currently under investigation. They are being tested through clinical trials to develop vaccines and medicines to prevent and treat COVID-19.
- Antibiotics should not be used as a means of prevention or treatment of COVID-19. Physicians sometimes use antibiotics to prevent or treat secondary bacterial infections which can be a complication of COVID-19 in severely ill patients.

### **Animals**

- There is no vaccine available against COVID-19 at this time in animals. There is a canine corona virus vaccine, but it is directed against another member of the corona virus family and does not provide protection against COVID-19.
- The animal (dog or cat) should be kept quarantine to check symptoms of COVID-19 infection and follow veterinary examination of nasal, oral, rectal swabs as well as faeces for SARS-CoV-2.
- Risk management measures should be followed, including cleansing and disinfection of the premises, and proper personal hygiene and protection.



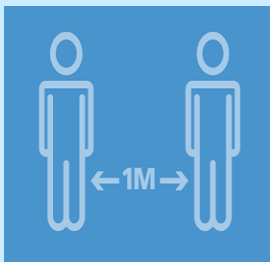
- Mammalian pets from households with confirmed human cases of COVID-19 will be placed under quarantine and veterinary surveillance for 14 days.
- People who are sick with COVID-19 and people who are at risk limit contact with companion and other animals.
- When handling and caring for animals, basic hygiene measures should always be implemented, which includes hand washing after handling animals, their food, or supplies, as well as avoiding kissing, licking or sharing food.

## **PREVENTION AND CONTROL**

### **Humans**

- Stay aware of the latest information on the COVID-19 outbreak,
- Clean your hands regularly and thoroughly with an alcohol-based hand rub or wash them with soap and water for at least 20 seconds..
- Maintain at least 1 meter distance between yourself and others. When someone coughs, sneezes, or speaks 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 has the disease.
- Avoid going to crowded places and close contact with people who are sick.
- Cover your mouth and nose with a cloth face cover/mask when around others and avoid touching eyes, nose and mouth.
- Stay home (self quarantine) even with minor symptoms such as cough, headache, mild fever, until you recover.
- Seek medical attention, if you have a fever, cough and difficulty in breathing,
- Personal protective equipment (PPE) kits should be used by health workers.

- Daily clean and disinfect touched surfaces which includes tables, door knobs, light switches, countertops, handles, desks, phones, keyboards, toilets, faucets, and sinks.
- Take care of vulnerable population i.e., individuals more than 60 yr than the young adults or pediatric population.
- Widening of testing and treatment capacity.



**Social distance**



**Face mask**



**Personal protective  
equipment (PPE)**



**Wash hands**

## **Animals**

- While handling and caring for animals, basic hygiene measures should always be implemented which includes hand washing after handling animals, their food, or supplies, as well as avoiding kissing, licking or sharing food.
- Animals that test positive for SARS-CoV-2 should be kept away from unexposed animals and avoid contact with those animals.
- People who are infected with SARS-CoV-2 should avoid close contact with their pets and follow good hygienic practices.
- Appropriate and effective biosecurity measures should be practiced when people have contact with groups of animals on farms, zoos and in animal shelters.
- Wash your hands regularly with soap and potable water after touching animals and animal products, as well as avoid touching eyes, nose or mouth, and avoid contact with sick animals or spoiled animal products.

- Raw meat, milk or animal organs should be handled with care, to avoid potential cross-contamination with uncooked foods..
- Avoid contact with animal waste or fluids on the soil or surfaces of shops and market facilities.
- Cook the animal origin foods including meat, milk, eggs and fish thoroughly. It is completely safe to eat non-vegetarian food.

## CONCLUSIONS

- COVID-19 is the infectious disease caused by recently discovered coronavirus.
- Currently, there is no evidence that companion animals are playing a significant epidemiological role in the spread of COVID-19.
- Public health and veterinary services should work together using a 'One Health' approach to share information and conduct a risk assessment when a person with COVID-19 reports being in contact with companion or other animals.
- There is a need to strengthen biomedical research and combination of innovative novel diagnostic technologies, including next-generation sequencing, improve healthcare delivery system, establish a permanent 'watch-dog' body and create an improved communication and coordination mechanism for the diverse agencies responsible for mitigating the broader adverse consequences of pandemic.
- This will require not only national efforts but a coordinated global response through international agencies and development partners.

*(Note: For further more information please refer to [www.who.int](http://www.who.int)., [www.oie.int](http://www.oie.int)., [www.cdc.gov](http://www.cdc.gov), Lorusso et al., 2020, [www.mohfw.gov.in](http://www.mohfw.gov.in)).*