

Coronavirus Disease 2019 (COVID-19): A Global Health Emergency

The outbreak of SARS-CoV-2, a novel corona virus previously dubbed 2019-nCoV, that emerged in late 2019 in Wuhan, China, and the resulting Covid-19 disease has taken the world by surprise and confirmed our shared global vulnerability to the appearance of new pathogens. It has now infected more than 9826 people across 20 countries. Nearly 200 people have died, all of them in China where the outbreak began.¹

Corona viruses are enveloped non-segmented positive sense RNA viruses belonging to the family Corona viridae and the order Nido virales and broadly distributed in humans and other mammals. The name “corona virus” is derived from the Latin *corona*, meaning *crown*. When viewed under electron microscope the virus resembles a royal crown or a solar corona. Six (229E, NL63, OC43, HKU1, MERS-CoV and SARS-CoV) were previously known to infect people; SARS-CoV-2 made it seven. Although most human corona virus infections are mild, the epidemics of the two beta corona viruses, severe acute respiratory syndrome corona virus (SARS-CoV) and Middle East respiratory syndrome corona virus (MERS-CoV), have caused more than 10 000 cumulative cases in the past two decades, with mortality rates of 10% for SARS-CoV and 37% for MERS-CoV.^{2,3} The third zoonotic human corona virus of the century emerged in December 2019, with a cluster of patients with connection to Hunan South China Seafood Market in Wuhan, Hubei Province, China. The suspicion of emergence of new virus arose when a cluster of people in a sea-food market at Wuhan City, China developed pneumonia without any clear cause. The WHO was notified of the first suspected cases on 31st December 2019 and decided against declaring the outbreak a public health emergency of international concern on 30th January 2020.⁴

Examining the whole genome, SARS-CoV-2 maintains ~80% nucleotide identity to the original SARS epidemic viruses. Its closest whole genome relatives are two bat SARS-like CoVs (ZC45 and ZXC21) that shared ~89% sequence identity with SARS-CoV-2 so most likely ecological reservoirs for SARS-CoV-2 are bats, but it is believed that the virus jumped the species barrier to humans

from another intermediate animal host.⁵ The WHO reported that environmental samples taken from the marketplace have come back positive for the novel corona virus, but no specific animal association has been identified. An initial report suggested that snakes might be the possible source based on codon usage,⁶ but the assertion has been disputed by others. It is now quite clear that efficient human-to-human transmission by respiratory droplets exists and is a requirement for the large-scale spread of SARS-CoV-2. Emerging evidence suggests that it may also be transmitted through contact and fomites.

Similar to SARS-CoV, a recent study confirmed that Angiotensin Converting Enzyme 2 (ACE 2), a membrane exopeptidase, present in humans in the epithelia of the lung and small intestine is the receptor used by SARS-CoV-2 for entry into the human cells. The asymptomatic incubation period for individuals infected with SARS-CoV-2 is estimated to range from 1 to 14 days. Symptoms may include fever, dry cough, shortness of breath, sputum production, sore throat, chills and diarrhea. Further development can lead to severe pneumonia, acute respiratory distress syndrome, sepsis, septic shock, and death. Among those who died, many had preexisting conditions, including hypertension, diabetes, or cardiovascular disease, and the median time from initial symptoms to death was 14 days (range 6–41 days). Men had a death rate of 2.8% while women had a death rate of 1.7%. In those under the age of 50 the risk of death is less than 0.5% while in those over the age of 70 it is more than 8%. No deaths had occurred under the age of 10.⁷ The basic reproduction number has been estimated to be between 1.4 and 3.9 which means each infection from the virus would typically be expected to result in 1.4 to 3.9 new infections. Laboratory testing uses real time reverse transcription polymerase chain reaction (rRT-PCR). The test can be done on respiratory or blood samples and results are generally available within a few hours to days.

There is currently no specific antiviral treatment or vaccine to prevent COVID-19. The best way to prevent illness is to avoid being exposed to this virus. However, as a reminder, CDC always recommends everyday preventive actions to help prevent the spread of respiratory diseases, including 1. avoid close contact with people who are sick, 2. avoid touching your eyes, nose, and mouth, 3. stay

home when you are sick, 4. cover your cough or sneeze with a tissue, then throw the tissue in the trash, 5. clean and disinfect frequently touched objects and surfaces using a regular household cleaning spray or wipe, 6. facemasks should be used only by people who show symptoms of COVID-19 to help prevent the spread of the disease to others. The use of facemasks is also crucial for health workers and people who are taking care of someone in close settings (at home or in a health care facility), 7. Wash your hands often with soap and water for at least 20 seconds before eating; and after blowing your nose, coughing, or sneezing.

No cases have yet been detected in Bangladesh however the dense population has made the country vulnerable to the outbreak. The corona viruses already identified might only be the tip of the iceberg, with potentially more novel and severe zoonotic events to be revealed. Global health experts are warning that the outbreak is a harbinger of things to come. The best strategy for thwarting this epidemic, and for preventing the next, is to help other nations — wherever they are — fight humanity's common enemy over there before we have to fight it over here. We must always remember together we are more powerful and containment starts with you.

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