

SARS-CoV-2 COVID-19..... Pandemic 2020

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Coronavirus a large family of viruses that causes illness from common cold to severe disease. These coronaviruses get their name from presence of halo around spiked proteins that adorn their outer surface, which resemble as a crown [corona] under the microscope. This viral family infect a wide range of animals as well as humans. At present there is seven types of corona virus strains known to infect humans including SARS-CoV-2. Four of these strains are regularly circulate in humans and causes mild to moderate upper respiratory tract infection as common cold. The other three coronaviruses that recently moved from animals to humans resulting in more severe disease. These three strains include SARS-CoV-2, MERS-CoV causes Middle East Respiratory Syndrome [MERS] and SARS-CoV which causes Severe Acute Respiratory Syndrome [SARS].

This novel corona virus is a new strain that has not been previously identified in human beings. This virus has been named SARS-CoV-2 and the disease named as “coronavirus disease 2019” or “COVID-19”. Here the CO stands for corona, VI stands for virus and D stands for disease.

All these three viruses MERS-CoV, SARS-CoV and SARS-CoV-2 have their origin in bats. Literature revealed the link of SARS-CoV to viruses in bats, which may have moved to humans through masked palm civets and raccoon dogs sold for food in live markets in China. Middle East Respiratory Syndrome is thought to have spread from bats to dromedary camels before jumping to humans. SARS-CoV-2 is related to coronavirus in bats, but its intermediate host and route to humans are not clear till now. Although there is speculations that the intermediate host could be pangolins, but is not confirmed till date.

Many of the patients initially at the epicenter of the outbreak in Wuhan, Hubei Province, China had some link to a large seafood and live animal market which suggest animal-to-person spread, later on increasing number of patients did not have exposure to animal markets, this indicate person-to-person spread. Person-to-person spread was subsequently reported outside Hubei and in countries outside China. Few countries now shows community spread with the virus that causes COVID-19.

SARS-CoV-2 spreads mainly in respiratory droplets which contains minute germs carrying globs secreted from mouth and nose of patients during talk, cough and sneeze. Published data suggest that approximately 40,000 droplets ranging 0.5 - 12 micrometers in diameters are released by single sneeze. Once they get airborne, they will fall to ground and land typically around one meter. These SARS-CoV-2 containing droplets gain their access to the eyes, nose, mouth on nearby persons, places and get infected. The WHO says that SARS-CoV-2 may survive on the surface from few hours to several days and its survival will depend upon environmental factors as temperature, humidity and type of surfaces. COVID-19 typically has the symptoms like flu which include respiratory symptoms as dry cough, shortness of breath and breathing difficulties and fever. It takes five to six days from the day a person get infected with SARS-CoV-2 until development of symptoms of COVID-19. This pre-symptomatic period also known as “incubation” can range from one to 14 days.

In some patients particularly the elderly and chronic health disease person like cardiovascular disease, diabetes, chronic respiratory disease, hypertensive patients these symptoms can develop into pneumonia with chest tightness, chest pain, and shortness of breath. In more severe cases, infection can cause severe acute respiratory syndrome, sepsis, septic shock, renal failure and multi-organ failure.

Although the biology during transmission is unknown so far but it is considered that SARS-CoV-2 get into the human cells by inserting on a receptor molecule on outside of the cell called angiotensin converting enzyme-2 [ACE-2], these receptors are present on the cells of lower respiratory tract, which may explain why COVID-19 includes fewer upper respiratory tract infection symptoms such as runny nose and why it does not seem to spread as readily in the pre- symptomatic period, like influenza. The WHO defines six stages of influenza as:

1. **Stage-1:** No animal influenza virus circulating among animals has been reported to cause infection in humans. That means confined to animals only.
2. **Stage-2:** An animal influenza virus circulating in domesticated or wild animals is known to cause infection in humans and thus considered a specific potential pandemic threat.
3. **Stage-3:** An animal or human-animal influenza reassortant virus has caused sporadic cases or small clusters of disease in people, but it has not resulted in human-to-human transmission sufficient to sustain community-level outbreaks.
4. **Stage-4:** Human-to-human transmission of an animal or human-animal influenza reassortant virus able to sustain community-level outbreaks has been verified.
5. **Stage-5:** The same identified virus has caused sustained community level outbreaks in two or more countries in one WHO region.
6. **Stage-6:** In addition to the criteria defined in Phase 5, the same virus has caused sustained community level outbreaks in at least one other country in another WHO region.

Post-peak period

Levels of pandemic influenza in most countries with adequate surveillance have dropped below peak levels.

Post-pandemic period

Levels of influenza activity have returned to the levels seen for seasonal influenza in most countries with adequate surveillance.

Global number of cases has reached approximately 1,32,000, across 114 countries, it is clear now that the virus has surpassed the definition of an epidemic. Pandemic refers to an epidemic that has spread across countries and continents and the worldwide spread of a new disease causing agent which are different from strains currently circulating among humans and has the ability to infect people easily. This virus has spread globally and no vaccines or treatment have been officially found yet. Thus, declaring it as a global pandemic is must to contain its spread.

Standard recommendations to prevent infection is isolation, quarantine, good personal hygiene, use of disinfectants, and limitations of public gatherings. Regular hand washing, covering mouth and nose when coughing and sneezing, avoid close contact with anyone showing symptoms of respiratory illness such as coughing and sneezing.

No one knows uptill when we live with this virus as these pandemics are extremely unpredictable, but it is to be expected that COVID-19 will be with us for at least the coming months. Till then we have to be very cautious and keep our spirit high, mentally, physically, morally and spiritually to win from this global pandemic COVID-19.

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