



## Covid-19: A Review on Corona Virus

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### ABSTRACT

Coronavirus area largest cluster of viruses. Coronavirus is a RNA virus, with enveloped non metamer, single stranded and positive sense RNA genome. Within December 2019 corona virus emerged in Wuhan, China. It is an infectious disease caused by a newly discovered corona virus. Coronaviruses mainly affects the common cold and respiratory tracts of birds, mammals, including humans. Other severe acute respiratory syndrome corona virus (SARS-CoV), Middle East respiratory syndrome coronavirus (MERS-CoV) are Zoonotic and particularly infectious viruses that have resulted in regional and world outbreaks. After a month SARA-CoV-2 is spreading across the globe, it is now present in 109 countries. In the March 11, 2020, WHO declared that Covid-19 is one the pandemic disease. In this review, we explained brief introduction, structure, classification and life cycle, current prevention and treatment methods.

**Keywords:** Coronavirus, Covid-19, SARS-CoV, MERS-CoV

### INTRODUCTION

Over the past 50 years the emergence of the many totally different corona viruses that cause a large kind of human and animals and birds diseases. It's probably that these viruses can still emerge and to evolve and cause each humans and veterinary widespread illness. According to WHO viral disease continue to appear and pose a major public health concern. The past decades, the world has seen the existence of new novel corona virus that posed serious threats to global health. In late December 2019, several patients in Wuhan, China started reporting symptoms that resembled pneumonia. A new virus was identified and initially called the 2019 novel corona virus (2019-nCoV) [1]. The corona virus emergence and its origin, ability to spread among humans remains unknown. The increasing the cases in the present scenario seem to possess resulted from human to human transmission. Within the 2002 SARS-CoV (Severe acute respiratory syndrome corona virus) outbreak and in the year 2012 MERS-CoV (Middle east respiratory syndrome) outbreak, in the 2019-nCoV-19

is the third corona virus to emerge in the human population in the past two decades- an emergence in the global outbreaks [2]. Corona viruses are a largest cluster of viruses which will pass insects to birds, mammals together with humans. Coronavirus disease 2019 (Covid-19) may be a respiratory disorder caused by a new corona virus termed SARS-CoV2 [3].

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The virus most likely appear from an unidentified animal source and is after transmitted from person to person [4]. Covid-19 is transmitted through the air droplets by coughing and sternutation, lose personal contact or touching a pestilence contaminated object so touching nose and eyes. Reportable illness ranges from delicate to severe or even death. The strain of different coronavirus spread barely from different persons. The aim of the current study is discussing concerning the brief introduction about the Novel corona virus.

**Classification:**

- Kingdom - Orthornavirae
- Phylum - Pisuviricota
- Class - Pisoniviricetes
- Order - Nidoviral
- Family - Coronaviridae
- Subfamily - Orthcoronavirinae

Coronaviruses are cluster of virus belongs to the Nidovirales order which has coronaviridae family. Coronavirirane are more divided into 4 genera. These are alpha, beta, gamma and delta corona virus. The virus was divided supported on the phylogenetic clustering [5].

All the viruses within the Nidovirales order are enveloped, non-segmental positive sense RNA viruses. All of them contain terribly largest genomes for RNA viruses, with some viruses having the Largest identified RNA genomes containing up to 33.5 kilo base genome. In the Nidovirus families of virus the most variations is that the number, type and size of the structural proteins as a result of the many alterations within the structure and morphology of the nucleocapsids and virions. All corona viruses are pleomorphic in nature.

Human corona virus was first known in 1960. Previously Covid-19 (coronavirus) is known as human susceptible virus. Common types of Corona virus are as follows:

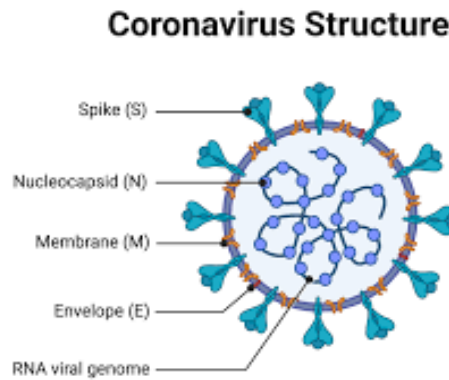
1. 229E (alpha corona virus)
2. NL63 (alpha corona virus)
3. OC43 (beta corona virus)
4. HKUI (beta corona virus)

Some strain it causes, more sever complication these are MERS-CoV (Middle East Respiratory syndrome), SARS (Severe acute respiratory syndrome). The new one is SARS-CoV2 in 2019; it is a dangerous strain inflicting the illness COVID-19 [2].

Alpha –beta corona virus primarily infects mammals. Gamma, delta corona virus strain infects birds. SARS-CoV, MERS-CoV and SARS CoV-2 are examples of beta virus. FCoV (Feline enteric corona virus) and CCoV (Canine Corona virus) are examples of alpha virus. According to Baltimore classification Corona virus placed in the IV cluster.

## Structure of Corona virus

The name corona virus is derived from Latin 'Corona', which means Crown. On the virus structure spike like project on the surface as found on a crown, that's why they are known as corona virus – one that looks like a crown. Corona virus are a group of enveloped viruses, single stranded and +ve sense RNA genomes and a unique strategy (Figure -1).



**Figure 1: Coronavirus structure [7]**

The structural proteins present in corona viruses include S protein, M protein, E protein, and N protein. All Structural proteins are encoded within the 3' end of the RNA genome. The virion genome about 50-200nm in diameter. Within the envelop, the virion nucleocapsid is present.

**1. M protein-** It is the foremost verdant structural protein within the virion. It is a small (25-30) protein with three Transmembrane domains. It has N-terminal glycosylated ectodomain and much larger C-terminal endo domain.

**2. S protein-** S protein helps in the binding of the host cell membrane. The angiotensin-converting enzyme2 (ACE2) receptors on host cells have been found to be the target of S-proteins, and it undergoes structural changes to fuse with the host and this eventually allows viral genes to enter the host cell.

**3. E protein-** It's extremely divergent Transmembrane protein. It helps in the gathering and release of the virus.

**4. N protein-** It constitutes the only protein present in the nucleocapsid. It is combined with the two domains these are N-terminal domain and C-terminal domain. These 2 domains help within the binding of the RNA in vitro. Each domain uses completely non-identical mechanism to bind RNA [5].

## Life Cycle

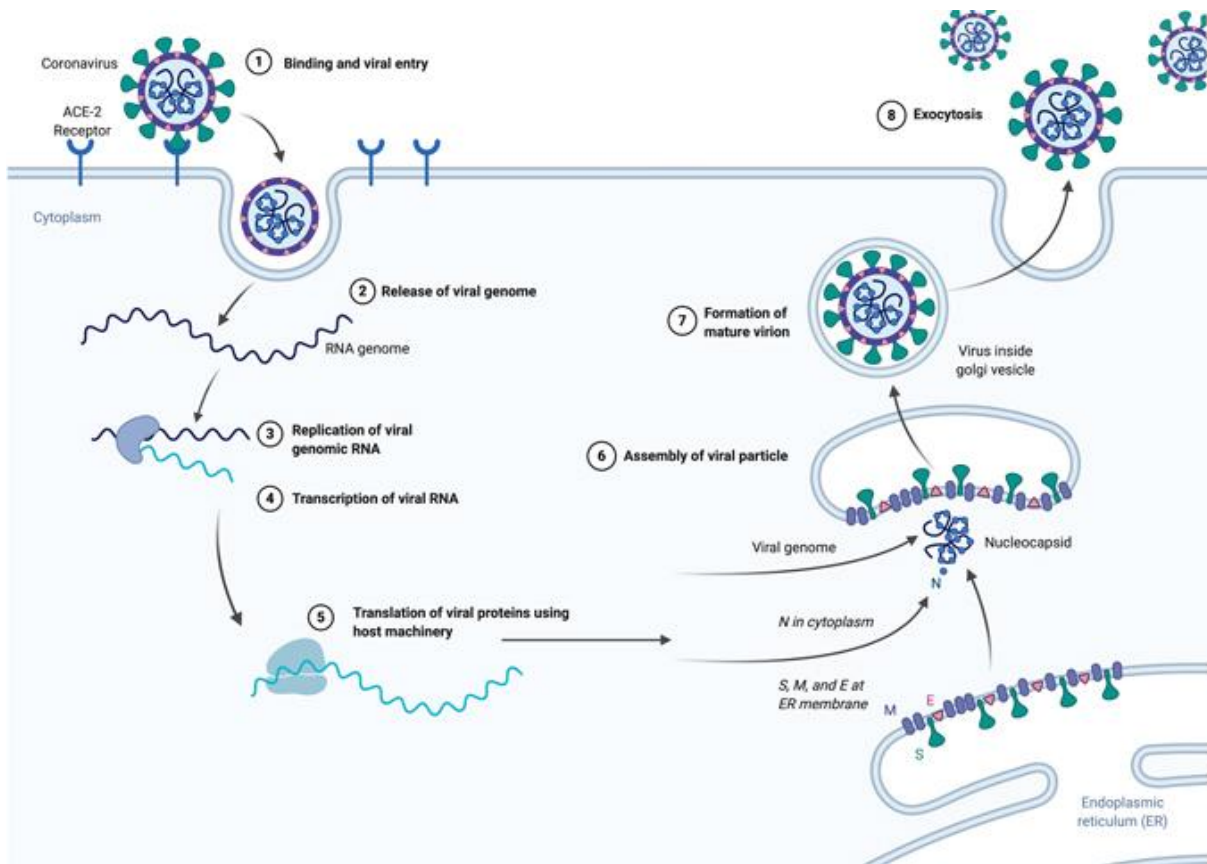
The corona virus life cycle diagrammatic representation (Figure 2).

### Corona virus Life cycle steps

1. Attachment and entry
2. Replicase protein expression

3. Replication and transcription

4. Assembly and release



**Figure 2: Corona Virus Life cycle [7]**

**Epidemiology**

Covid-19 pandemic started in early December from Wuhan city. The corona virus exported country to country. The number of Covid-19 cases constantly increasing worldwide and Asian and European regions. Unfortunately to the present situation, it is one of the pandemic diseases, worldwide.

Till June 18, 2020, based on the WHO reports of Evening at 5:30 PM the cases are globally 8,367,894 present cases in this Recovery cases are 4,091,398 and death cases 449,397. In India cases reported totally 366,946 and Recovery cases are 194,325 and deaths are 12,237 cases [6].

**Transmission**

The different strains of coronavirus spreads across the globe. The research is still going on the transmission of virus. However, Scientist believed that the corona virus transmits via fluids within the systema respiratorium like mucous secretion [1].

Corona virus transmission

- Cough or sneeze releases droplets into the atmosphere.

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- By touching an infected person or the surface that has the virus and then touching their own nose, eyes or mouth.
- Some animal corona viruses may unfold to humans through contact with excretory product.

The many groups of people have the highest risk of developing complication due to Covid-19 which includes as follows:

1. Immunocompromised peoples
2. Young children
3. Individual aged 65 years
4. Pregnant woman

### **Symptoms**

Coronavirus affects completely different people in several ways, most infected people can develop delicate to moderate health problem and recover while not hospitalization [1,2].

#### Common symptoms

- Dry cough
- Tiredness
- Sneezing
- Runny nose
- Watery diarrhea
- Fever in rare cases
- Sore throat
- Fever

#### Serious Symptoms

- Difficulty breathing
- Chest pain

Researcher cannot easily cultivate the spreading of novel corona virus within the laboratory. At this scenario no vaccine is developed against the corona virus. Thus, self-caring is very important step to manage the corona virus.

### Prevention, diagnosis and treatment

The CDC recommended different steps to regulate, and manage the transmission of SARS-CoV-2 do the following [1].

- Frequent hand washing a minimum 20 seconds by using alcohol based 60% hand sanitizer is suggested
- Maintain a minimum 1 meter distance from an individual coughing and sneezing.
- Avoid touching your face, nose, and eyes.
- Cover your mouth and nose whereas coughing or sneezing
- Drink hot water for healthy life
- Stay home if you are feeling unwell

Diagnosis is additionally vital within the controlling the Covid-19 in the present situation. The identification of cases can guide the event, of public health measures to manage the widespread illness. It's conjointly vital to diagnose cases of severe veterinary coronavirus, to control the pathogens. RT-PCR has the best method for the diagnosis of human CoV-19. Within the March, 2020, researcher developed the Plasma therapy for controlling the coronavirus. There are some limited data to suggest that convalescent plasma from people who have recovered from Covid-19 may have some benefit for people with active Covid-19. And another type of product called hyper immune globulin, which is manufactured from convalescent plasma. RT-PCR assays have been developed, to detect the all four types' respiratory Human Corona virus illness [2].

Many antiviral medication area being tried to assist patients with severe symptoms the corona virus. Four Covid-19 patients in China, improved with a medical aid of Lopinavir and ritonavir [9]. The other urged antiviral medicine like neuraminidase inhibitors, anti-malarial (Chloroquine). There are multiple research groups making an attempt to analyze a possible vaccine for the virus. June 16,2020 WHO updated the dexamethasone vaccine preliminary results of the patients, who suffering from the Covid-19 disease, and also updated the recent research and treatment of severe cases against Covid-19 disease, from United Kingdom results. They Confirmed the dexamethasone corticosteroid, can be life saving for critically ill patients with Covid-19 disease.

Further studies are going on to know the usage of the steroids, and lifesaving treatments and vaccines to control the pandemic coronavirus disease in the present scenario [1]. Some of the important drugs worked against the Covid-19 disease. Throughout the world research is carry out, for controlling the coronavirus. Some of the important drugs are listed in the Table 1.

**Table 1: The recent drugs against the Covid-19 disease**

Country	Drug	Status of the drug	Reference
India	Hydroxychloroquine	Current investigation explained that the drug does not result in the reduction of mortality of Covid-19 patients. It may have side effects on patients.	[10]

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<b>China</b>	Favilavir	The NMPA of china has approved the use of Favilavir an antiviral drug as a treatment for corona virus. The drug has reportedly shown efficiency in treating the disease with minimal side effects in a clinical trial involving 70 patients.	[10,11]
<b>Wuhan (China)</b>	Remdesivir	The Wuhan institute of virology has approved the use of Remdesivir to treatment of corona virus. It showed about 50% good results against Covid-19 disease	[11]
<b>United Kingdom</b>	Dexamethansone	The drug has been proven to reduce the risk of death significantly in COVID19 patients on ventilation by as much 35% and patients on oxygen by 20%. Its saves thousands of lives against deadly virus.	[ 10,12]

**CONCLUSION**

This review provides a brief summarization about Novel corona virus (n-CoV) and present situation. Coronavirus disease continues to spread across the region incredibly quickly, killing people. The individual aged about 65 years and immune compromised people; children are most at risk to the mortal recurrent of the corona virus. Research is still going on to know the origin of corona virus and vaccine against virus. In future, analysis on corona viruses can still to investigate several aspects of corona virus replication, genome organization and vaccine and control measures.

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