



### Coronavirus 2020 – a Review

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#### Abstract

Communicable diseases represent a major threat to human beings in developed and developing countries alike. On January 8, 2020, a novel coronavirus was officially announced as the causative pathogen of COVID-19 by the Chinese Center for Disease Control and Prevention. Coronavirus are positive stranded RNA viruses that can infect birds, animals and humans. Taxonomically, these viruses are joined with the Coronaviridae family within the Nidovirales order. The suppression of viral infections is a current dispute in the medical field, not only due to the problem of spreading but also to the virus ability to escape therapy by genetic mutations.

**Keywords:** coronavirus, covid-19, virus

#### Introduction

Coronaviruses are a large family of viruses with some causing less severe common cold to more severe diseases such as SARS (severe acute respiratory syndrome) and MERS (Middle East respiratory syndrome). Many coronaviruses are zoonotic, denotation they are transmitted from animals to human beings. Coronaviruses are large, enveloped and positive stranded RNA viruses that can infect aves, animals and humans (Su *et al.*, 2016).

## Morphology of Coronavirus

The coronavirus virion is an enveloped particle containing the spike (S), membrane (M) and envelope (E) proteins. In addition, a few strains of coronaviruses, but not SCoV, express a hemagglutinin protein (HE) that is also incorporated in the virion. The genome of coronaviruses is a linear, single-stranded RNA molecule of positive (mRNA) polarity and from 28 to 32 kb in length (Drosten *et al.*, 2003).

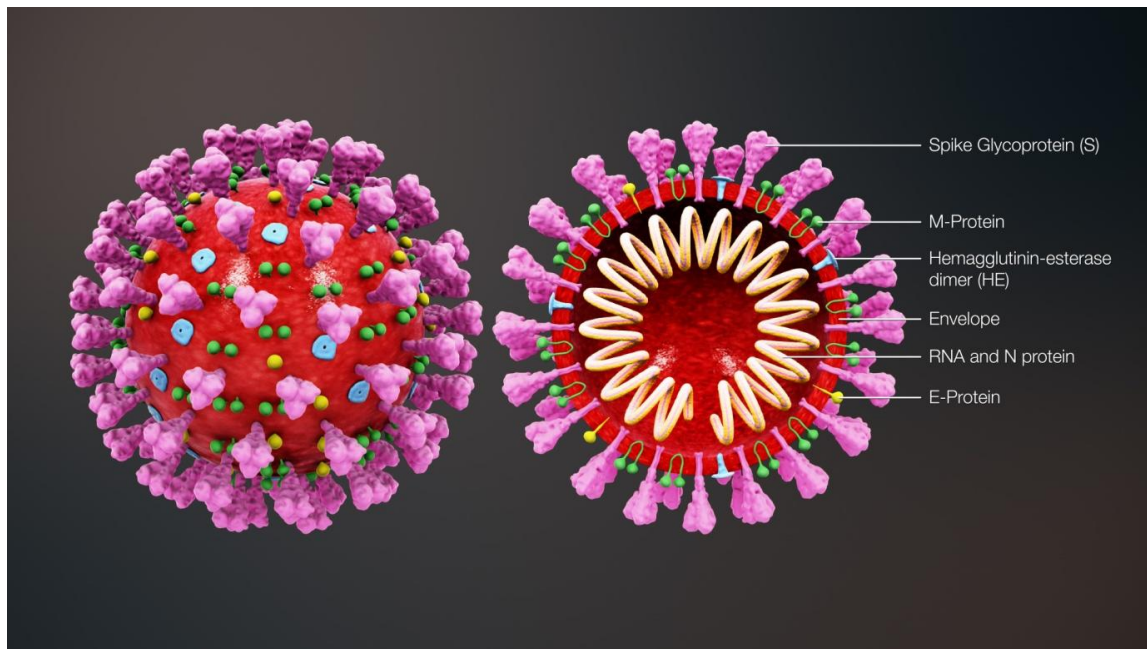


Fig: Coronavirus structure (Source: <https://www.scientificanimations.com/>)

## Taxonomy of Coronavirus

The International Committee on Taxonomy of Viruses (ICTV) was founded in 1966 as the International Committee on Nomenclature of Viruses (<http://www.ictv.global>).

### Classification

Family: Coronaviridae

Subfamily: Orthocoronavirinae

Order: Nidovirales

Suborder: Cornidovirineae

Genus: Coronavirus

Reference: Fields *et al.*, 2007

Coronaviruses have extended into four genera, Alpha, Beta, Gamma and Deltacoronavirus (Woo *et al.*, 2009). Of these, betacoronaviruses (betaCoVs) have paying attention global because of their pathogenic capacity and potential to cause a worldwide pandemic of human infection (WHO, 2014) and the widespread existence of an enormous number of species in bats (Woo *et al.*, 2012, Li *et al.*, 2005).

**Table: Classification of coronaviruses**

**Group 1**

Human coronavirus (HCoV) 229E  
 Human coronavirus NL63  
 Porcine transmissible gastro-enteritis virus (TGEV)  
 Canine coronavirus (CCoV)  
 Feline infections peritonitis virus (FIPV)  
 Porcine epidemic diarrhea virus (PEDV)  
 Bat coronavirus (e.g. 1A, HKU2)

**Group 2**

Human coronavirus (HCoV) OC43  
 Human coronavirus HKU1  
 SARS coronavirus  
 Rat coronavirus (RCoV)  
 Rat sialodacryo-adenitis virus (SDAV)  
 Porcine haemagglutinating encephalomyelitis virus (HEV)  
 Bovine coronavirus (BCoV)  
 Mouse hepatitis virus (MHV)  
 Bat coronaviruses (e.g. SARS-like coronavirus Rp3, HKU4, 229E)

**Group 3**

Avian infectious bronchitis virus (IBV)  
 Turkey coronavirus (TCoV)

**History of Coronavirus (CoV)**

Ever since the 1930s, when the first coronavirus of infectious bronchitis virus was isolated in aves particularly chickens (Schalk and Hawn, 1931). In 2002 and 2003, one representative betaCoV, the SARS-CoV, first emerged in China (12-15) and then rapidly spread to other

countries, leading to >8000 cases of infection and >800 deaths (Weinstein, 2004). In 2012, an additional betaCoV, named the MERS-CoV, was identified first in Saudi Arabia (Zaki *et al.*, 2012).

### Incubation Period

The incubation stage of COVID-19 has been predictable at 5 to 6 days on average, but there is evidence that it could be as long as 14 days, which is now the normally adopted duration for medical observation and quarantine of exposed persons (Backer *et al.*, 2020).

### Precautions

#### N95 face masks

An N95 respirator is a more tight-fitting face mask. In addition to splashes, sprays and large droplets, this respirator can also filter out 95 % trusted source of very small particles. This includes viruses and bacteria (e.g., N95 masks authenticated by the NIOSH (National Institute for Occupational Safety and Health) / FFP2 standard masks set by the European Union). Dispose of the mask if it is wet or dirty on the inside, if it is deformed, or if the filter is torn. A deformed mask may not fit properly. An N95 mask cannot be cleaned or disinfected.



Fig: N95 face masks (Source: <https://www.globalmedicalshop.com/>)

## Coronooa 2020

### In China

The first known case of the viral infection later called COVID-19 was detected in the Wuhan City of People's Republic of China on December 1, 2019. It was dubbed an outbreak on December 12 by the Chinese state broadcaster and the WHO was notified on December 30 and the viral genome sequence was decoded on January 3, 2020. The events since then are well-known the virus has spread to 200 countries, resulting in over 4,65,900 confirmed cases as on date.

### In India

The first case was noticed in Kerala on January 30, 2020, in a scholar who had come back from China. By this time, it had spread to several countries outside of mainland China and the WHO declared coronavirus as a 'public health emergency of international concern' on January 31.

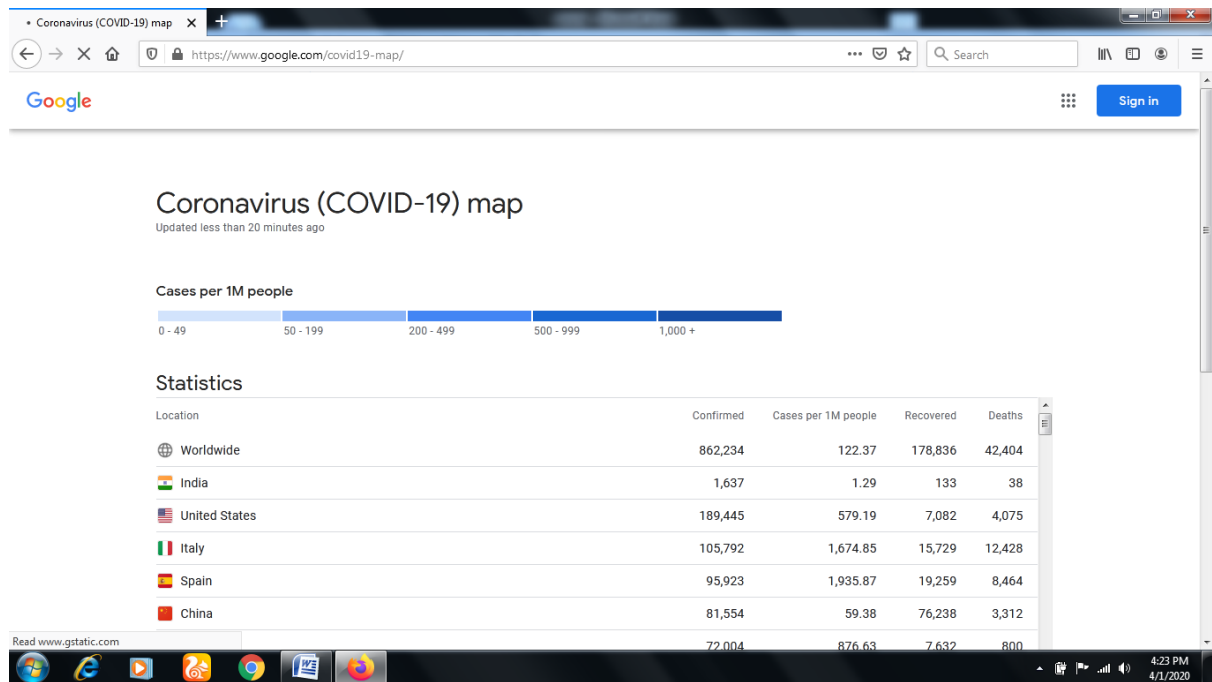
Till February 29, 2020, three cases were reported in India, all in Kerala. They were swiftly identified and quarantined. This period was the first and perhaps the most important window of opportunity for the research experts and public health specialists to come together and contextualise the available evidence as applicable to the Indian setting in terms of testing, treatment, prophylaxis and mathematical models of transmission and help guide policy.

The failure of the Indian research society to respond to this imminent threat with sufficient alacrity is surprising. The first reports of coronavirus being noticed by the Indian research community appear in the third week of February, 2020. Still, there seems to be little urgency amongst the Indian public health community in trying to predict the impact of this pandemic (<https://www.thehindu.com>).

### Drug

Early researchers mostly utilized TEM (Transmission Electron Microscopy) and biochemical experiments to examine viral infection mechanism in cells. The eradication of viral infections is an ongoing challenge in the medical field, not only due to the problem of spreading but also to the virus ability to escape therapy by genetic mutations.

## Statistics



**Fig: COVID-19 map (Source: <https://www.google.com/covid19-map/> )**

## Conclusion

We must be always awake of infectious threats that may challenge the current infection control procedure, especially in public places.

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