

## Chapter 2

# The Study of the Epidemiology and Clinical Features of the Novel Coronavirus (COVID-19)

**Ranjit Barua**

 <https://orcid.org/0000-0003-2236-3876>

*Indian Institute of Engineering Science and Technology, Shibpur, India*

**Sudipto Datta**

*Indian Institute of Engineering Science and Technology, Shibpur, India*

**Amit Roychowdhury**

*Indian Institute of Engineering Science and Technology, Shibpur, India*

**Pallab Datta**

*Indian Institute of Engineering Science and Technology, Shibpur, India*

### ABSTRACT

*Epidemiology is the technique used to detect the origins of health outcomes and diseases in inhabitants. In epidemiology, the patient, the individual, and community are viewed mutually. Epidemiology is not only the analysis of health in inhabitants; it also includes applying the information enlarged by the analysis of public-based practice. In case of medicine, the practice of epidemiology is both an art and science. Currently, COVID-19 has spread all around the world. It is basically a severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). Through the binding of receptor in gene region of its spike protein, ACE2 is bounded by corona virus. In this chapter, the authors summarized the epidemiological characteristics, clinical features, diagnosis, and treatment prognosis of COVID-19. A complete consideration will help to control the disease.*

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## **INTRODUCTION**

By the late of 2019 a novel virus started spreading in Wuhan city of China from a Seafood market. This virus spread very fast from Wuhan to worldwide within a couple of months (Huang et al; 2020). Very soon it is identified that the virus belongs to a family of virus known as coronavirus like SARS and MERS having spikes on the outer surface of the spherical virus. That spikes acts like a key for specific human lung cells, by lock and key mechanism the virus attaches with the human lung cells and infects the host. This new novel coronavirus was named as SARS-CoV-2 as it is very much similar to SARS-CoV because the new coronavirus also causes severe acute respiratory syndrome and due to high homology i.e. 80% like that of SARS-CoV of 2003 (Zhou et al; 2020). Earlier the novel coronavirus was thought to have been transmitted from seafood animals like zoonotic mode of transmission but this assumption was proved wrong as afterwards it was found out that human transmission also played a important role for the following situation (Lu et al; 2020). WHO i.e. World Health Organization initially named the novel coronavirus as 2019-nCoV on January 12th 2020. Later WHO changed the name to 2019 coronavirus i.e. COVID-19. Meanwhile CSG (Coronavirus Study Group) of the international committee proposed to change the name from COVID-19 to as SARS-CoV-2 from Feb 11th 2020. The researchers of China on 7th January 2020 identified a SARS-CoV-2 virus from an infected patient and studied done the genomic sequencing (Zhou et al; 2020) soon WHO declared the new virus outbreak as a pandemic. SARS-CoV-2 infected approximately 200 countries worldwide (Riou et al; 2020) (WHO, 2020).

## **EPIDEMIOLOGY OF SARS-CoV-2**

The novel coronavirus of unknown type was first spread from the seafood market of Wuhan, China from 12th Dec 2019. Many studies showed that bats can be the main source of this novel coronavirus transmission to the human population (Giovanetti et al; 2020) (Paraskevis et al; 2020). There is lack of evidence to prove that the SAR-CoV-2 spread from the seafood market presented at Wuhan, China. Which in turn points towards the bats because earlier bats were found out to be a virus carrier of both SARS-CoV and MERS-CoV (Hampton et al; 2005) (Banerjee et al; 2019) (Li et al; 2005). After the genomic sequencing of the virus was done it was found out that genomic sequence identity matched with the Bat CoV RaTG13 with a similarity of 96.2% (Zhou et al; 2020) which showed the scientists that SARS-CoV-2 and Bat CoV RaTG13 originated from the same ancestor but bats are not sold in the seafood market of the Wuhan, China (Wu et al; 2020). COVID-19 has spread worldwide. As per the data till April 2020, COVID-19 has highest number of patients in US followed by Spain, Italy, Germany, France and China, whereas Italy was more significantly affected by COVID-19. Maximum fatality cases were reported in elderly patients. At that time, the fatality rate of Italy was 7.2% (G. Onder et al; 2020) (Livingston et al; 2020). Also the fatality rate in Italy was mainly affected by the patients aged 70 years or more. The fatality rate of Italy was described with the help of demographic features .The data from US and other countries is obtained in the number of resources (Zheng et al; 2020) (Dong et al; 2020). Till the date 28<sup>th</sup> September, 2020, there are 33,034,598 confirmed cases of COVID-19, including 996,342 deaths (Figure. 1) (WHO; 3:52pm CEST, 28 September 2020).

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