



# Covid-19: A Review of the Relentless Pandemic Ever

Mohit Kishore Srivastava<sup>1</sup>, Dileep Kumar<sup>1</sup>, Sugandha Jauhari<sup>\*2</sup>, Anil Kumar Gupta<sup>1</sup>, Sudhir R. Kishore Mishra<sup>2</sup>, Ganesh Yadav<sup>1</sup>

<sup>1</sup>Department of Physical Medicine and Rehabilitation, King George Medical University, Lucknow, 226003, India

<sup>2</sup>Department of Community Medicine, Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow, 226010, India

\*Corresponding Author: Sugandha Jauhari; [rohitsriv14elec@gmail.com](mailto:rohitsriv14elec@gmail.com)

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## Abstract

This article highlights key facts about the recent ongoing relentless pandemic of SARS-COV2 virus causing the disease COVID 19. On 31 December 2019, WHO was alerted to a cluster of pneumonia patients in Wuhan City, Hubei Province of China. WHO first declared it as a Public Health Emergency of International Concern (PHEIC) under International Health Regulations (2005) on 30th January and finally it was designated as "Pandemic" on 11th March 2020 when majority of European countries, western pacific region, region of America and south-east Asia was adversely affected. The pandemic has caused almost 20 lakh confirmed cases globally with 1,23,000 deaths making it one of the worst pandemics of this time. The developed countries have been adversely affected with massive load on their health care system and unavailability of proper protective equipment's for the frontline workers followed by unavailability of any vaccine or treatment for this disease. Social distancing, Hand hygiene and wearing masks seem to be the most effective preventive measure to contain the virus. Due to this both the developing and developed countries have undergone complete lockdown to prevent further transmission of virus.

**Keyword:** COVID 19, pandemic, corona virus

## Introduction

On 31 December 2019, WHO was alerted to a cluster of pneumonia patients in Wuhan City, Hubei Province of China. On 1 January 2020, Huanan Seafood Wholesale Market in Wuhan city was closed for environmental sanitation and disinfection as it was associated with many early cases of the pneumonia of unknown etiology outbreak. One week later, on 7 January 2020, Chinese authorities confirmed that they had identified a novel corona virus as the cause of the pneumonia. The proposed interim name of the virus was 2019-nCoV<sup>[1]</sup>. On 30 January 2020, the WHO Director-General declared the 2019 nCoV outbreak a Public Health Emergency of International Concern (PHEIC) under International Health Regulations (2005).<sup>[2]</sup> On 11 February 2020 the virus, and the disease it causes, were officially named. The novel corona virus was named severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) and the disease it causes was COVID-19<sup>[3]</sup>. Finally, on 11 March 2020 the WHO Director-General declared the COVID-19 outbreak a pandemic<sup>[4]</sup>.

Corona viruses (CoV) are a large family of viruses that cause a wide range of illness in human beings, through zoonotic transmission ranging from the common cold to more severe diseases i.e. Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). In the past two decades, this is the third instance of the emergence of a novel corona virus, after SARS in 2003 and MERS-CoV in 2012<sup>[5,6]</sup>.

## Epidemiology of COVID 19

**Incubation Period:** The incubation period for COVID-19, which is the time between exposure to the virus (becoming infected) and symptom onset, is on average 5-6 days (median IP), however can be up to 14 days<sup>[7]</sup>. The incubation period for COVID-19 remains comparable to other recent epidemic viral diseases - SARS (2-7 days) and MERS-CoV (2-14 days), but it is slightly longer than swine flu (1-4 days) and seasonal influenza (1-4 days)<sup>[8,9,10]</sup>.

**Modes of transmission:** Transmission is also noted from animals and human-to-human.

**Symptomatic transmission:** Data from published epidemiology and virologic studies provide evidence that COVID-19 is primarily transmitted from symptomatic people to others who are in close contact through respiratory droplets, by direct contact with infected persons, or by contact with contaminated objects and surfaces<sup>[1,2,7,11,12]</sup>.

**Pre-Symptomatic transmission:** A few case reports and studies, pre-symptomatic transmission has been documented through contact tracing efforts and enhanced investigation of clusters of confirmed cases. This is supported by data suggesting that some people can test positive for COVID-19 from 1-3 days before they develop symptoms. Thus, it is possible that people infected with COVID-19 could transmit the virus before significant symptoms develop<sup>[13-16]</sup>.

**Asymptomatic transmission:** There are few reports of laboratory-confirmed cases who are truly asymptomatic, and to date, there has been no documented asymptomatic transmission. This does not exclude the possibility that it may occur. Asymptomatic cases have been reported as part of contact tracing efforts in some countries [17].

## Case Definitions

Case definitions being used currently are based on the WHO's interim guidance documents [18].

### Suspect case

A patient with acute respiratory illness (fever and at least one sign/symptom of respiratory disease, e.g., cough, shortness of breath), AND a history of travel to or residence in a location reporting community transmission of COVID-19 disease during the 14 days prior to symptom onset.

OR

A patient with any acute respiratory illness AND having been in contact with a confirmed or probable COVID-19 case (see definition of contact) in the last 14 days prior to symptom onset;

OR

A patient with severe acute respiratory illness (fever and at least one sign/symptom of respiratory disease, e.g., cough, shortness of breath; AND requiring hospitalization) AND in the absence of an alternative diagnosis that fully explains the clinical presentation.

### Probable case

A suspect case for whom testing for the COVID-19 virus is inconclusive. Inconclusive being the result of the test reported by the laboratory.

OR

A suspect case for whom testing could not be performed for any reason.

### Confirmed case

A person with laboratory confirmation of COVID-19 infection, irrespective of clinical signs and symptoms.

**Definition of contact:** A contact is a person who experienced any one of the following exposures during the 2 days before and the 14 days after the onset of symptoms of a probable or confirmed case:

1. Face-to-face contact with a probable or confirmed case within 1 meter and for more than 15 minutes
2. Direct physical contact with a probable or confirmed case
3. Direct care for a patient with probable or confirmed COVID-19 disease without using the proper personal protective equipment
4. Other situations as indicated by local risk assessments.

**Individuals at risk:** The virus that causes COVID-19 infects people of all ages. However, evidence to date suggests that two groups of people are at a higher risk of getting severe COVID-19 disease. These are older people (that is person over 60 years old); and those with underlying medical conditions (such as cardiovascular disease, diabetes, chronic respiratory disease, and cancer). The risk of severe disease gradually increases with the age starting from around 40 years. It's important that adults in this age range protect themselves and in turn protect others that may be more vulnerable [19].

**Clinical manifestations:** Illness starts with a fever followed by dry cough, and then, after a week, leads to shortness of breath and some patients need hospitalization. The most common symptoms at illness onset are fever (99%), fatigue (70%), dry cough (60%), myalgia (44%) and dyspnoea. Less common symptoms are headache, dizziness, diarrhoea, nausea, and vomiting. Symptoms such as pharyngeal pain, dyspnoea, dizziness, abdominal pain and anorexia are more likely to be present in patients with severe illnesses [12,20-21].

**Diagnosis:** Patients who satisfy clinical case definition and are epidemiologically linked to a history of travel from the city of Wuhan or other affected country in the last 14 days, or have come in contact with a reverse transcription (RT)-PCR confirmed case or with a patient who is under investigation for SARS-COV-2 within the same period, are considered as suffering from COVID-19. The WHO recommends that the culture of the virus must be done in a BSL-3 laboratory and the RT-PCR be done in a BSL-2 laboratory. Preferred clinical samples for establishing the laboratory confirmation of a suspected case include nasopharyngeal and oropharyngeal swabs collected using Dacron swabs, expectorated sputum, BAL fluid, endotracheal aspirate, and tissue [22-24].

**Prevention and treatment:** Currently, there is no available treatment or vaccination, and only supportive measures are being recommended. Standard precautions consist of hand hygiene, use of personal protective equipment (PPE) and respiratory and cough etiquettes. Hand hygiene should be done with alcohol-based hand rubs (ABHRs) containing 60-80 percent ethanol. PPE consists of the medical masks or particulate respirators, face shields or goggles, gowns, gloves and shoe covers [25,26].

## How Infectious is COVID 19 ?

An ICMR study has found that a Covid-19 patient can infect 406 people in 30 days if preventive measures such as lockdown and social distancing are not implemented. COVID-19 remains a highly infectious disease, with reproductive number (R0) estimates ranging from 1.4 to 3.5. Basic case reproduction number (R0) is the average number of secondary cases per case (number of successful transmissions per case) in a totally susceptible population. When  $R0 > 1$  number of cases increases,  $R0 = 1$  number of cases is stable and  $R0 < 1$  number of cases decreases. R0 depends on three factors i.e. duration of infectiousness, probability of infection being transmitted during contact between a susceptible and infected individual and average rate of contact between susceptible and infected individuals. R0 for COVID-19  $\approx 1.5-4.5$  while it is 3 for SARS and 1-3 for flu. Case increases fast when  $R0 > 1$  (large) and when serial interval (interval between first and second case) is small [27-29].

The case fatality rate (CFR) of COVID-19 has been seen to be higher in China (2.1%) than outside (0.5%) [29]. Mortality in Wuhan was even higher at 4.9% while it was 3.1 percent in the Hubei province. As far as India is concerned, the present CFR is approximately 3% [30-31].

## Indian Perspective of COVID 19

The first case of COVID 19 was reported on 30<sup>th</sup> January, 2020 in India and the affected person had history of travel from Wuhan to India. The first death due to COVID 19 was reported on 13<sup>th</sup> February, 2020. India has been under lockdown since 24<sup>th</sup> March 2020 for period of 21 days which has been extended for another 19 days till 3<sup>rd</sup> May, 2020. With a population of 135.26 crores and a

very high population density per square feet, the present outbreak can take a grievous picture if proper social distancing and other safety measures including following the rules of lockdown are not followed properly. The aim is to flatten the epidemic curve so that preventable deaths can be avoided, and health system can be prepared without causing excessive burden on our frontline health care workers. The graph in **fig 1**, depicts that cases are gradually increasing in India and burden of death is still low which indicates that lockdown has been effective in averting unnecessary deaths, and there can be possibility of breaking the chain of transmission.

## Global Scenario of COVID 19

Globally the number of cases and well as deaths have increased rapidly. As on 15<sup>th</sup> April, 2020, there are almost 20 lakh cases of COVID 19 globally and almost 1,23,000 deaths have occurred. The European and American regions seem to be the worst affected (**Fig 2,3**). This has been attributed to the fact that these developed countries are testing their population at a fast rate. The south-east Asia and African regions are not very adversely affected. Various theories have been postulated for the mismatch of cases and deaths between these developed and developing countries, but none has been justified.

## Conclusion

There have been several lessons to glean from the global response to the SARS-COV-2 threat. Most responses have been reactive, with little preparedness investment in health systems and through community engagement and empowerment. However, the emphasis on data sharing, the rapid development and distribution of interim guidance documents by WHO and open-access pre-print sharing of rapidly emerging evidence reflect a paradigmatic shift in providing a data-driven global-epidemic response.

## Ethics approval and consent to participate:

Not Applicable

## List of abbreviations:

PHEIC: Public Health Emergency of International Concern,  
WHO: World Health Organization

## Data Availability

Not Applicable

## Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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## Authors' contributions

MKS did the review of literature of recent evidence related to Covid-19 and was a major contributor in writing the manuscript. DK was also involved in literature search and drafting of manuscript. SJ did the review of literature and was a major

contributor in writing the manuscript. AKG was also involved in literature search and drafting of manuscript. SRM was also involved in literature search and editing of manuscript. GY was also involved in literature search and editing of manuscript. All authors read and approved the final manuscript."

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