

A 360° View on Epidemiology of Corona Virus

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ABSTRACT

A new public health emergency has arisen in the world due to the spread of the 2019 novel coronavirus (2019-nCoV). The deadly virus had its first origin from Wuhan, Hubei Province, China. As per the World Health Organization report, there have been around 4,628,903 confirmed cases of COVID-19 and 312,009 deaths globally to date (May 18, 2020). The mode of transmission of this disease is through close contacts (about 6 feet) mainly via respiratory droplets of infected individual. Estimated case fatality rate varies between 2 and 3. In the absence of definite treatment for COVID-19, the evidence-based supportive care with preventive measures is the only way known so far for its management. In this review, we summarized the existing research results to describe the current pandemic of COVID-19.

Keywords: 2019-nCoV, COVID-19, Epidemiology, Review.

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INTRODUCTION

Coronaviruses target the respiratory system, which is its prime prey. In the past, the outbreaks such as the severe acute respiratory syndrome (SARS)-CoV (2003) and the Middle East respiratory syndrome (MERS)-CoV (2012) have been categorized as major public health threat.¹ The World Health Organization (WHO) has identified the causative organism of this SARS-CoV-2 disease and named as coronavirus disease-2019 (COVID-19). Coronavirus are enveloped RNA viruses with spike-like projections, giving it a crown-(in Latin = "corona") like appearance.² The virus is having close resemblance to bat coronavirus RaTG13 based on phylogenetic analysis. Even the asymptomatic individuals can transmit the infection.³

HOW IT STARTED?

During the late December 2019, a cluster of patients with pneumonia of unknown etiology had been reported to hospitals, and they had exposure history similar to the ones from seafood wholesale market in Wuhan, Hubei Province, China.⁴ The disease has been declared as "Public Health Emergency of International Concern" (PHEIC) on January 30, 2020. Later on, based on the assessment about its severity, it has been characterized as a pandemic by the WHO (Fig. 1).

As per the recent statistics from WHO, in China itself a total of 84,494 confirmed cases and 4,645 fatal cases have been identified. Globally, more than 4 million confirmed cases are being reported from 211 countries and regions with cumulative deaths of more than 317,894 cases.⁵

CURRENT MAGNITUDE

The World Health Organization has declared the recent novel coronavirus outbreak as pandemic on March 11, 2020. As per WHO situation report of May 18, 2020, globally, there are 4,618,821 confirmed cases, with China accounting for 84,494 confirmed cases and 4,645 deaths. For India, the same report shows total 96,169 confirmed cases with 3,029 deaths, and many suspected cases are at surveillance as of now.⁶

The difficulty in identifying cases at an early stage of COVID disease, especially during the incubation period, reflected in the above statistics. Therefore, it is necessary to proactively find cases at their first contact to health facility. These not only require the

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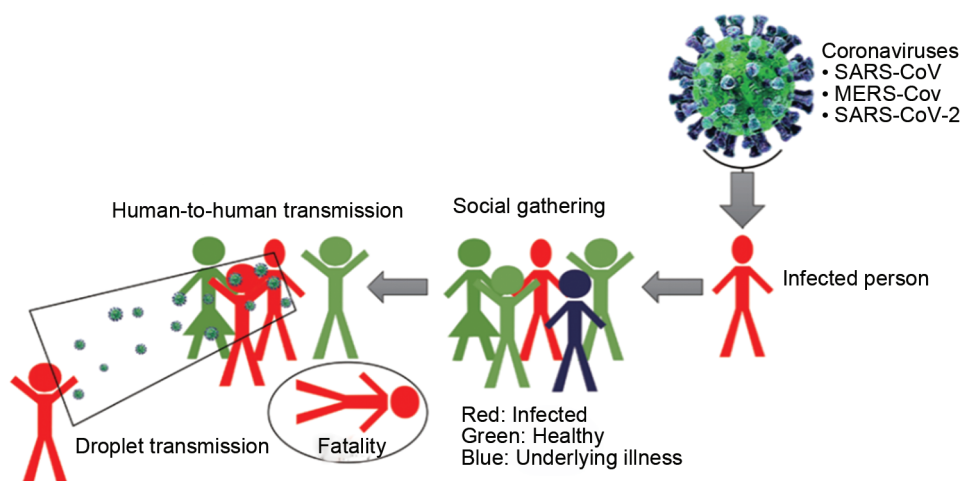
sensitive laboratory test but more crucially demand the early detections for suspicious clinical symptoms (Fig. 2).

SITUATION IN INDIA

Followed by the initial curfew all over India, the government started lockdowns in 75 districts and all major cities where COVID cases had occurred. On March 24, 2020, the Indian Prime Minister ordered a nationwide lockdown for 21 days. In India, the trend of corona cases is not much as per the reports when compared to most affected countries, namely, the United States, Italy, Spain, Germany, and France. There can be a number of factors or arguments stating that India is not much affected so far. There are issues for not conducting enough number of tests. But, ICMR opined that only 30% of the capacity of their testing laboratories has been utilized based on the samples collected from the clinical cases suspected of corona. There have been efforts to stop/delay/interrupt community transmission by the government.

ALL ABOUT EPIDEMIOLOGY

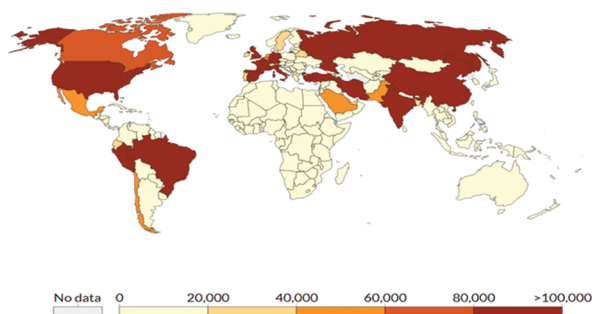
Based on the literature, the mean incubation period was estimated to be 5.2 days.⁷ In the early phase, the doubling time of epidemic was 7.4 days based on the R₀, i.e., the basic reproductive number of

Fig. 1: Transmission of coronavirus¹²

Total confirmed COVID-19 cases, May 18, 2020
The number of confirmed cases is lower than the number of actual cases; the main reason for that is limited testing.

Our World in Data

World



Source: European CDC - Situation Update Worldwide - Data last updated 19th May, 24:30 (GMT+05:30)
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Fig. 2: Total confirmed cases till May 2020

approximately 2.2. Whereas modeling study by Wu et al. estimated epidemic doubling time of 6.4 days considering the R_0 of 2.68.⁸ These numbers are likely to be changed based on the further evidence. The evidence of human-to-human transmission has been reported in cluster of cases from Shenzhen and Vietnam. In a study by Wang et al., 57 (41.3%) cases were infected in the hospital which include 17 (12.3%) patients and 40 (29%) healthcare workers which is again of great concern. Symptomatic infected individuals are the major source for the human-to-human transmission.⁹

CASE DEFINITION¹⁰

Suspected Case

(A) "Patients with severe acute respiratory infection (fever, cough, and requiring admission to hospital), AND with no other etiology that fully explains the clinical presentation AND at least one of the following:

- A history of travel to or residence in the city of Wuhan, Hubei Province, China, in the 14 days prior to symptom onset
- Patient is a healthcare worker who has been working in an environment, where severe acute respiratory infections of unknown etiology are being cared for".

(B) "Patients with any acute respiratory illness AND at least one of the following:

- Close contact with a confirmed or probable case of COVID-19 in the 14 days prior to illness onset
- Visiting or working in a live animal market in Wuhan, Hubei Province, China, in the 14 days prior to
- Symptom onset, or
- Worked or attended a healthcare facility in the 14 days prior to onset of symptoms, where patients with hospital-associated COVID-19 infections have been reported".

Probable Case

"A suspect case for whom testing for COVID-19 is inconclusive or for whom testing was positive on a pan-coronavirus assay."

Confirmed Case

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

EPIDEMIOLOGICAL DOUBTS/CONCERNS

A panic situation had been reported in Germany about the transmission of 2019-nCoV infection, where an asymptomatic contact was suspected to be responsible for transmission which leads to questioning about our understanding of current transmission dynamics of the virus. Infection appeared to have been transmitted during the incubation period of the index patient. This is in contrary to other reports suggesting that patient had nonspecific symptoms during transmission and was not totally asymptomatic.¹¹

CONCLUSION

The recent initiatives taken to tackle COVID-19 in India is exemplary; however, strengthening of the existing medical and public health infrastructure at all levels of healthcare delivery is the need of the hour. India has opportunity and is capable of creating history to keep the impact of present pandemic at the low level of adversity.

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