



Review Article

OVERVIEW OF CORONAVIRUS (COVID-19) PANDEMIC IN TAMILNADU, INDIA

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ABSTRACT

Corona viruses are zoonotic pathogens that are present in humans and various animals with a wide range of clinical features from asymptomatic course to requirement of hospitalization in the Intensive Care Unit (ICU) causing many infections in respiratory, gastrointestinal, hepatic and neurologic systems. The global outbreak of corona virus disease 2019 (Covid-19) challenged the medical facilities and services all over worldwide with more than 200 countries affected by the pandemic effects. The Corona viruses (CoV) belong to the genus Corona virus in the Corona viridae. All CoVs are pleomorphic RNA viruses characteristically containing crown-shape peplomers with 80-160 nm in size and 27-32 kb positive polarity. Recombination rates of CoVs are very high because of constantly developing transcription errors and RNA dependent on the RNA polymerase (RdRP) jump. World Health Organization and Indian government are taking many efforts to control the spread of the virus rapidly among humans. All over country followed many Strategies such as self-quarantine, social distancing and 40-days countrywide lockdown helped to slow down the virus which could have spread tremendously otherwise specially paying attention to Tamilnadu state current situation. Our critical review focuses on the implications of Covid-19 in India especially Tamilnadu current scenario along with report and strategies employed for the pandemic control.

Keywords: Coronavirus, Lockdown, Hospitalization, Respiratory, Lungs.

INTRODUCTION

The outbreak of the novel coronavirus disease COVID-19 caused by the novel coronavirus 2019-nCoV that is now authoritatively designated as rigorous acute respiratory syndrome-related coronavirus SARS-CoV-2, represents a pandemic threat to global public health (Gorbalenya, 2020; Kupferschmidt & Cohen, 2020). The novel coronavirus disease in December 2019, a lower respiratory tract febrile illness of unknown origin was reported in cluster of patients in Wuhan City, Hubei Province, China. The initial outbreak was reported in the medical fields in December 2019 and involved about 66% of the staff there. The market was shut down on January 1, 2020, after the announcement of an epidemiologic alert by the local health authority on December 31, 2019. However, in the following month (January) thousands of people in China, including many

provinces such as Hubei, Zhejiang, Guangdong, Henan, Hunan, etc. and cities Beijing and Shanghai were attacked by the rampant spreading of the disease (WHO, 2020). A novel strain of coronavirus isolated from the bronchoalveolar lavage of the patients was determined to be responsible for the outbreak (Lu *et al.*, 2020). The pulmonary syndrome was later A novel strain of coronavirus isolated from the bronchoalveolar lavage of the patients was determined to be responsible for the outbreak named coronavirus disease 2019 (COVID-19) by the World Health Organization. Despite the imposition of strict quarantine rules and travel restrictions, the virus transmitted rapidly out of China with a number of confirmed cases reported in Europe, the United Kingdom, and the United States (WHO, 2020). In the similar pulmonary syndromes have been recognized as being caused by other strains of the coronavirus family. The most

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distinguished examples are the Severe Acute Respiratory Syndrome (SARS) and the Middle East respiratory syndrome (MERS). The SARS outbreak has been restricted with no human infection reported since 2003 small outbreaks of MERS continue to be reported (Hosseiny *et al.*, 2020).

Clinically, the immune responses induced by SARS-CoV-2 infection are two phased. During the incubation and nonsevere stages, a specific adaptive immune response is required to eliminate the virus and to preclude disease progression to severe stages. Therefore, strategies to boost immune responses (anti-sera or pegylated IFN α) at this stage are certainly important. For the development of an endogenous protective immune response at the incubation

and non-severe stages the host should be in good general health and an appropriate genetic background HLA that elicits specific antiviral immunity. Genetic differences are well-known to contribute to individual variations in the immune response to pathogens. However, when a protective immune response is impaired, virus will propagate and massive destruction of the affected tissues will occur, especially in organs that have high ACE2 expression, such as intestine and kidney (Shi *et al.*, 2020). The damaged cells induce innate inflammation in the lungs that is largely mediated by pro inflammatory macrophages and granulocytes. Lung inflammation is the main cause of life-threatening respiratory disorders at the severe stage (Xu *et al.*, 2020).

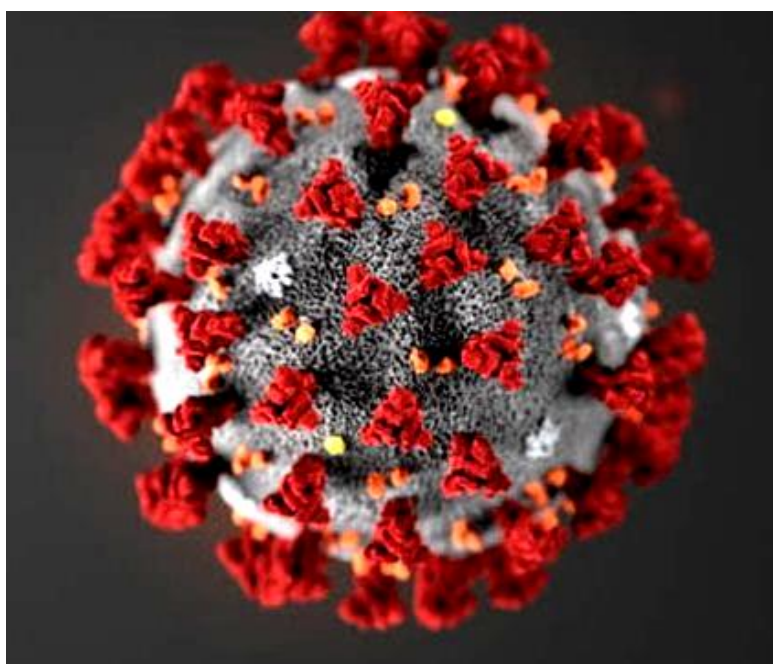


Figure 1. Structure of COVID-19 (Coronavirus) (Source: CDC).

Furthermore, the disease traveled to other countries, such as Thailand, Japan, Republic of Korea, Viet Nam, Germany, United States, and Singapore. The first case reported in our country was on January 21, 2020. As of February 6, 2020, a total of 28,276 confirmed cases with 565 deaths globally were documented by WHO, involving at least 25 countries (WHO., 2020). The two goals of these measures were to facilitate the care of patients with known or suspected COVID-19 (Figure 1) who needed surgery, and to reduce the risk of preoperative viral transmission to healthcare workers and other patients. At the time of writing, no patients with COVID-19 have required surgery, but we expect this to change in the near future as the number of cases increases globally (Wong *et al.*, 2020)

Today, 31st of March 2020, based on the WHO reports, we have globally 693,224 confirmed cases and

33,106 deaths, distributed as follows: Western Pacific Region 103,775 cases and 3649 deaths, European Region 392,757 cases and 29,962 deaths, South East Asia Region 4084 cases and 158 deaths, Eastern Mediterranean Region 46,329 cases and 2813 deaths, Region of the Americas 142,081 cases and 2457 deaths and in the Africa region 3486 cases and 60 deaths (WHO, 2020). In Tamil Nadu, till date 2, 10,538 passengers were screened at the Airports of Chennai, Trichy, Madurai, and Coimbatore. Total number of persons put on home quarantine till yesterday was 1, 07,193. Till date 87,159 passengers have completed 28 days follow-up. As on date 1, 08,337 passengers were put under home quarantine for 28 days. Currently, 145 asymptomatic passengers from highly affected countries are being quarantined in quarantine facilities near airport and 2,012 are under hospital isolation.

MATERIALS AND METHODS

In this present critical review paper developed by the help of various reference data base websites such as Science Direct, Google Scholar, Proquest, Research gate, Academia etc., the statistical data were retrieved individually through official websites of India state governments and Tamilnadu Government health department data up to 27.05.2020.

Medical evaluated COVID-19

However, more advanced virological and genetic studies have shown that bats are reservoir hosts of both SARS-CoV and MERS-CoV and before these viruses spread to humans, they use the other responsible animals as intermediate hosts. Studies have reported that most of the bat CoVs are the gene source of alpha-CoV and beta-CoVs, while most of the bird CoVs are the gene source of gamma-CoVs and delta-CoVs (Yin & Wunderink, 2018). For patients with suspected infection, the following diagnosis techniques are utilised: performing real-time fluorescence (RT-PCR) to detect the positive nucleic acid of SARS-CoV-2 in sputum, throat swabs, and secretions of the lower respiratory tract samples (Lippi *et al.*, 2020). In patients with COVID-19, the white blood cell count can vary. Leukopenia, leukocytosis, and lymphopenia have been reported, although lymphopenia appears most common (Lagier *et al.*, 2020; Lippi *et al.*, 2020). Elevated lactate dehydrogenase and ferritin levels are common, and elevated aminotransferase levels have also been described. On admission, many patients with pneumonia have normal serum procalcitonin levels; however, in those requiring ICU care, they are more likely to be elevated. High D-dimer levels and more severe lymphopenia have been associated with mortality. Imaging findings - Chest computed tomography (CT) in patients with COVID-19 most commonly demonstrates ground-glass opacification with or without consolidative abnormalities, consistent with viral pneumonia. Others study have suggested that chest CT abnormalities are more likely to be bilateral, have a peripheral distribution, and involve the lower lobes. Less common findings include pleural thickening, pleural effusion, and lymphadenopathy (Ai *et al.*, 2020; Bai *et al.*, 2020; Li & Xia, 2020). Chest CT may be helpful in making

the diagnosis, but no finding can completely rule in or rule out the possibility of COVID-19. An oropharyngeal swab can be collected but is not essential; if collected, it should be placed in the same container as the nasopharyngeal specimen. An oropharyngeal swab is an acceptable alternative if nasopharyngeal swabs are unavailable (Won *et al.*, 2018). Expecterated sputum should be collected from patients with productive cough; induction of sputum is not recommended. A lower respiratory tract aspirate or bronchoalveolar lavage should be collected from patients who are incubated. Data from this study suggested that viral RNA levels are higher and more frequently detected in nasal compared with oral specimens, although only eight nasal swabs were tested. SARS-CoV-2 RNA is detected by reverse-transcription polymerase chain reaction (RT-PCR) (Loeffelholz & Tang, 2020).

Current COVID-19 status of Tamilnadu

In our Tamilnadu government public health department take many prevention methods a positive test for SARS-CoV-2 generally confirms the diagnosis of COVID-19, although false-positive tests are possible. Our state government allotted many government and non government checking office. In progress day by day affected person count will be increased in spite of many cure cases produced in recent days. If initial testing is negative but the suspicion for COVID-19 remains, the WHO recommends resembling and testing from multiple respiratory tract sites (WHO, 2020) Till now 4, 42970 sample tested in various testing methods specially person tested (4.23, 018) and auto laboratory tested (539) day by day increasing affected person data current date whole Tamilnadu 18,545 positive cases were tested and confirm proper methods. All sample negative cases were recorded 4, 23,775 and under process 650 samples (Figure 2). In specific male only high levels affected 63.24 % and female affected 36.24 %. Compare to all other district Chennai only highest positive case recorded 12,203 and death 95, low level affected person noted in Dharmapuri district positive case only 8 was confirmed and active cases three discharge case five on the report on 26 May 2020 (Figure 3 and 4).

Table 1. Tamilnadu Government Media Bulletin 27.05.2020 Report on COVID-19.

S.No	COVID-19 Statistic	Details
1	Number of active cases on date (Including isolation)	8,500
2	Number of persons tested positive today in Tamil Nadu	678
3	Total Number of persons tested positive till date	18,545
4	Total Number of samples tested today/ till date	11,231/ 4,42,970
5	Total Number of persons tested today/ till date	10,661 / 4,23,018
6	No of Male / Female / Transgender tested positive today	508/ 309 / 0
7	No of Male / Female / Transgender tested positive till date	11,725 /6,815 / 5
8	Number of functioning COVID -19 testing facilities in Tamil Nadu	70 (42 Govt+ 28 Private)
9	Number of COVID-19 p. patients discharged following treatment today/ till date	567 / 9,909
10	Number of COVID-19 suspected individuals in isolation ward admission	5,771
11.	Total number of deaths today/ till date	6 / 133

Table 2. District wise abstract of COVID-19 positive cases in Tamilnadu.

S. No	Districts	Till 26.05.2020	27.05.2020	Grand Total
1	Chennai	11,645	558	12,203
2	Coimbatore	146	0	146
3	Tirupur	114	0	114
4	Dindigul	134	0	134
5	Erode	71	0	71
6	Tirunelveli	297	0	297
7	Chengalpattu	857	31	888
8	Namakkal	77	0	77
9	Trichy	76	3	79
10	Tiruvallur	785	40	825
11	Madurai	233	1	234
12	Thanjavur	84	1	85
13	Nagapattinam	51	1	52
14	Theni	108	0	108
15	Karur	80	0	80
16	Ranipet	96	0	96
17	Villupuram	327	0	327
18	Tiruvarur	37	5	42
19	Thoothukudi	187	2	189
20	Cuddalore	436	2	438
21	Tenkasi	85	0	85
22	Salem	68	0	68
23	Vellore	40	0	40
24	Virudhunagar	116	0	116
25	Thirupathur	31	1	32
26	Kanyakumari	58	0	58
27	Sivaganga	29	0	29
28	Thiruvannamalai	242	13	263
29	Ramanathapuram	64	1	65
30	Kancheepuram	316	14	330
31	Nilgiris	14	0	14
32	Perambalur	139	0	139
33	Ariyalur	357	4	362
34	Kallakurichi	153	1	154
35	Pudukottai	20	1	21
	Total	17,728	678	18,545

Sources and Modes of Transmission

CoVs have been defined as a novel respiratory tract virus in the samples collected from the many individuals who present symptoms of respiratory tract infection in 1962 (Hamre & Procknow, 1966). After the first outbreak, secondary cases began to be reported after approximately ten days. Moreover, while these new patients had no contact with the marketplace, they had a history of contact

with humans there confirmed recent reports from many infected healthcare workers in Wuhan show that human-to-human transmission can occur. The first non-Chinese case was infection which is spread to the Chinese provinces and then to the Asian continent was reported from Thailand on January 13, 2020. As in SARS and MERS epidemics in the past, human to human transmission has accelerated the spread of the outbreak and case reports have also started from other states of China.

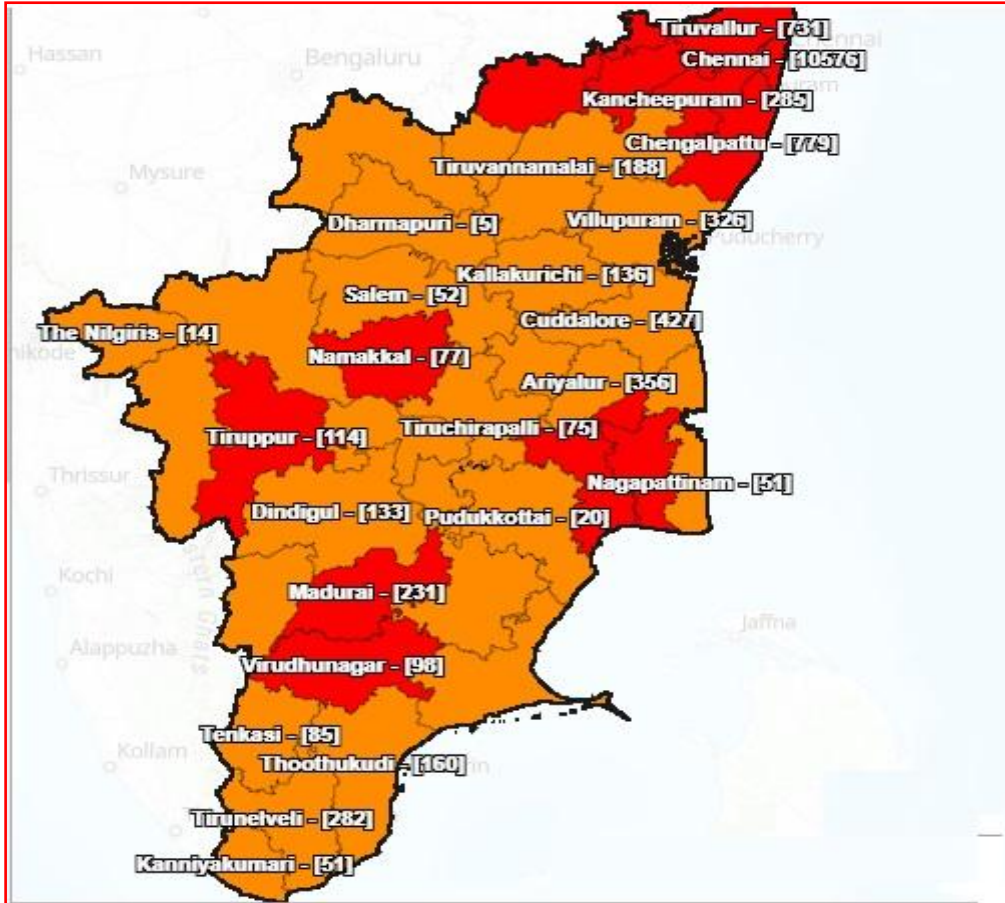


Figure 2. Source: Health and family welfare government of Tamilnadu

Comparison of COVID-19 Cases in Tamil Nadu by their Outcome

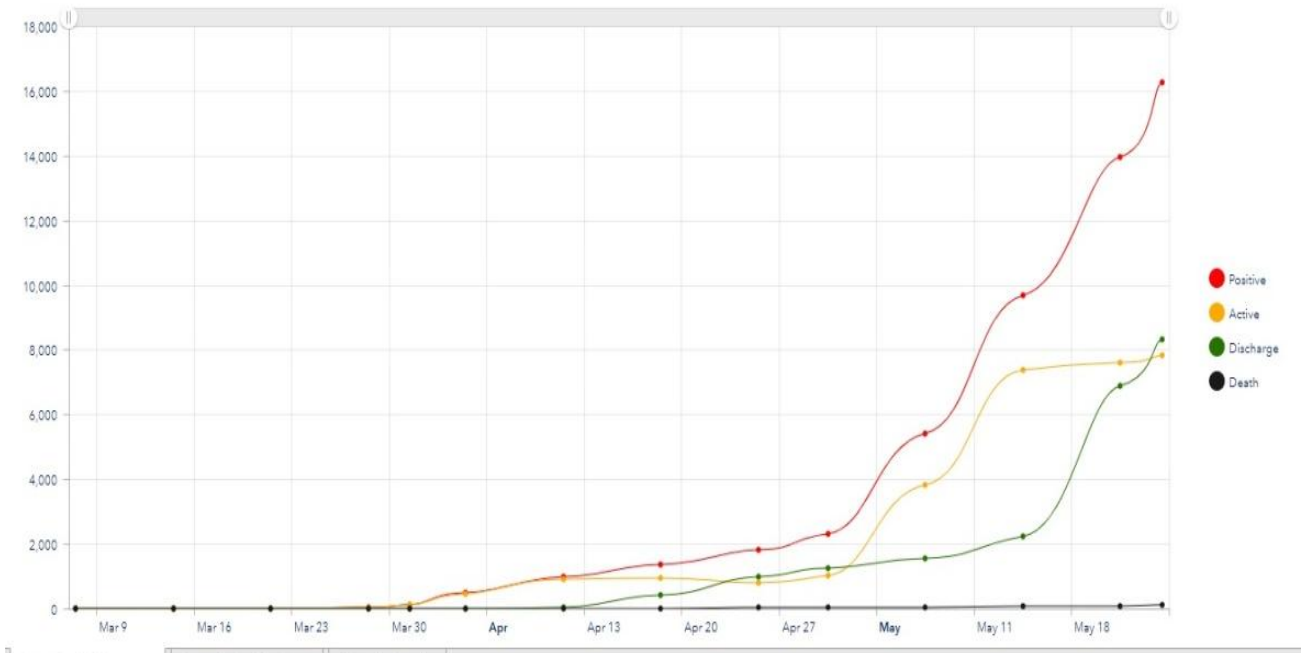


Figure 3. Source: Health and family welfare government of Tamilnadu (cases wise).

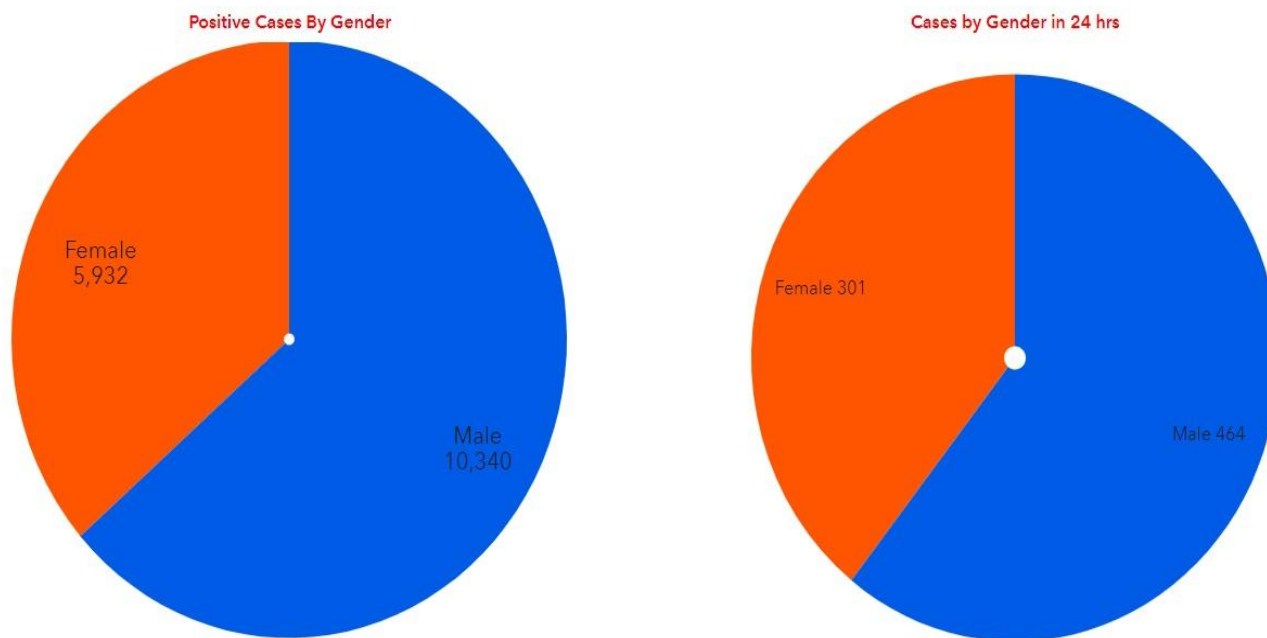


Figure 4. Source: Health and family welfare government of Tamilnadu (sex wise).

This is a large family of viruses that are common in many different animal species, including camels, cats, cattle, and bats. Rarely animal CoVs can infect humans and, as a result may spread among humans during epidemics such as MERS, SARS, and COVID-19 (Chu *et al.*, 2014; Subissi *et al.*, 2014). At the onset of major outbreaks caused by CoVs, palm cats have been proposed to be a natural reservoir of Human CoVs for SARS and dromedary camels for MERS (Yin & Wunderink, 2018). In recent much investigation it has been observed that the novel virus causing epidemics coincides with the CoV isolated in bats. Presence of wild animal trade in Huanan Seafoods Market where the first cases appeared, supports this finding (Gralinski & Menachery, 2020; Sahin *et al.*, 2020). The case reported being a Chinese tourist who has traveled to Thailand and had no epidemiologic connection with the marketplace (Hui *et al.*, 2020). Other cases from overseas countries such as the USA and France have continued to be reported (Holshue *et al.*, 2020). The transmission primarily occurs when an infected person sneezes and through the respiratory droplets produced just as the spread of influenza and other respiratory pathogens. These droplets can settle in the mouth or nasal mucosa and lungs of people with inhaled air. Currently, it remains unclear whether a person can be infected by COVID-19 by touching an infected surface or object and then touching their mouth, nose, or possibly eyes. Typically, like most respiratory viruses, it is considered to be the most contagious when people are most symptomatic. However, cases, which were infected from an asymptomatic person in the prodrome period of COVID-19, were also reported. Sufficient data are not available on infectiousness of the disease and research is ongoing. You

can become infected by coming into close contact about 6 feet or two arm lengths with a person who has COVID-19.

COVID-19 Symptoms

For confirmed COVID-19 cases (Table 2) reported illnesses have ranged from people with little to no symptoms to people being severely ill and dying. Symptoms can include (on admission to hospital) (Chen *et al.*, 2020): Fever (>80% of the patients), Cough (>80%), Shortness of breath (31%), Muscle ache (11%). The disease may also occur with mild symptoms only, including: low-grade fever, cough, malaise, rhinorrhoea and sore throat without any warning signs, such as shortness of breath or difficulty in breathing, increased respiratory secretions, gastrointestinal symptoms such as nausea, vomiting, and/or diarrhoea and without changes in mental status (WHO, 2020). Preliminary data report 11% lethality among hospitalized patients. Complications occurred in 33% of the patients, and included: acute respiratory distress syndrome (ARDS) (17%), acute renal injury, acute respiratory injury, septic shock and ventilator-associated pneumonia. (Lagier *et al.*, 2020). Risk factors for severe illness are not yet clear, although older patients or patients with underlying medical comorbidities (diabetes, hypertension, cardiovascular disease, cancer) may be at higher risk. In the most severe cases, infection can cause pneumonia, severe acute respiratory syndrome, kidney failure and even death (WHO, 2020). Disease in children appears to be relatively rare and mild with approximately 2.4% of the total reported cases reported among individuals aged less than 19 years. A very small proportion of those aged under 19 years have developed severe (2.5%) or critical disease (0.2%)(WHO, 2020).

y from others and disinfect items you must touch. Get deliveries and takeout, and limit in-person contact as much as possible. Stay home if you are sick, except to get medical care. Avoid all public transportation, ride sharing, or taxis. Separate yourself from other people and pets in your home. Currently, there is no specific medicine or vaccine for COVID-19 (Figure 1) and no medicines or vaccines have been fully tested for safety and efficacy. At present, antiviral therapy is mainly used, as well as symptomatic and supportive treatment based on the clinical condition of the patient. Supportive treatments include oxygen therapy, hydration, fever/pain control, and antibiotics in the presence of bacterial co-infection. If you need medical attention, call ahead. Whereas, for the preservation of public health and safety throughout the entire State of Illinois, and to ensure that our healthcare delivery system is capable of serving those who are sick, I find it necessary to take additional measures consistent with public health guidance to slow and stop the spread of COVID-19. To the extent individuals are using shared or outdoor spaces when outside their residence; they must at all times and as much as reasonably possible maintain social distancing of at least six feet from any other person, consistent with the Social Distancing Requirements set forth in this Executive Order. All persons may leave their homes or place of residence only for Essential Activities, Essential Governmental Functions, or to operate Essential Businesses and Operations, all as defined below. The mask should be close to the face, covering the nose and mouth completely. When the mask is on or being removed, the crew must not touch the out layer of the mask with hands to avoid hands contamination. Once dampened by secretions or contaminated by other contaminants, facial masks must be replaced immediately with new ones, and hands should be cleaned with sanitizer both before and after the replacement. All disposable protective equipment, after their use, should be placed in yellow medical waste bags. After the flight, they should be sprayed or sprinkled till fully soaked with chlorine-containing disinfectant (500 mg/L-1000 mg/L) before cleaning, and packed in a tightly knotted plastic bag for centralized disposal as medical wastes. The crew can use alcohol-based disinfection wipes or non-alcohol rinse free hand sanitizer to clean and disinfect hands. When crew members are not sure whether their hands are clean, they should avoid touching their noses, mouths and eyes with their hands. When sneezing or coughing, one should try to lower the head or turn away from passengers and crew members nearby, and cover the mouth and nose with tissue or flexed elbow. After touching or disposing wastes, hands should be cleaned with soap or hand sanitizer under running water followed by hand cleaning and disinfection.

Reusable goggles should be promptly sterilized and dried every time after use. Goggles with an anti-fogging film should avoid being wiped with disinfectant. Instead, it is recommended that they be washed with clean water before being exposed to close-range direct ultraviolet lighting for over 30 minutes. Crew members should reduce

their entry/exit of the cockpit and use intercom system for communication whenever they can to avoid close contact. They should avoid two of them dining at the same time, do not have cold dishes or cold meat/fish, choose prepackaged food to the greatest extent possible, and use rinse free hand sanitizer to clean and disinfect hands before meals. Also, they should use an exclusive lavatory and reduce their visit to the lavatory. The safety of the use of ibuprofen in COVID-19 patients has been questioned by an opinion article published by The Lancet suggesting that patients being treated with medicines that increase the expression of angiotensin converting enzyme 2 (ACE2) may be at increased risk of infection and/or severe COVID-19 disease (Fang *et al.*, 2020). ACE2 has been proven to mediate cell entry by SARS-CoV-2 in another paper (Hoffmann *et al.*, 2020). However, the evidence against the use of ibuprofen in COVID-19 patients is not robust enough to rule it out. Nevertheless, other medicines such as paracetamol /acetaminophen may be considered for the management of fever in COVID-19 patients if appropriate. Frequently clean hands by using alcohol-based hand rub or soap and water; When coughing and sneezing cover the mouth and nose with a flexed elbow or tissue – throw the tissue away immediately and wash hands; Avoid close contact with anyone who has fever and cough; If you have fever, cough and difficulty breathing seek medical care early and share previous travel history with your healthcare provider; When visiting live markets in areas currently experiencing cases of novel coronavirus, avoid direct unprotected contact with live animals and surfaces in contact with animals; The consumption of raw or undercooked animal products should be avoided. Raw meat, milk or animal organs should be handled with care, to avoid cross-contamination with uncooked foods, as per good food safety practices (WHO, 2020). Self-isolation by persons with symptoms and/or persons who may have been in contact with infected persons. Self-isolation means avoiding situations where you could infect other people. This means all situations where you may come in contact with others, such as social gatherings, workplaces, schools, child care/pre-school centres, universities, faith-based gatherings, aged care and health care facilities, prisons, sports gatherings, supermarkets, restaurants, shopping malls, and all public gatherings (Ministry of Health of New Zealand, 2020).

CONCLUSION

This review provides an insight into the COVID-19 current situation and represents a picture of the current state of the art in terms of public health impact, pathophysiology and clinical manifestations, diagnosis, case management, emergency response and preparedness. India still needs more sophisticated rapid viral testing kits and potential medication for treating the infected patients in order to overcome this national emergency. Positive cases and death toll may increase if the situation isn't handled with caution by the Indian residents. Many state government take necessary actions in this view Tamilnadu government have better preventive Ayurveda methods and social distance,

medical specialty better than others. Countrywide lockdown and social distancing measures greatly contributed in limiting the rapid spread of the disease. Only once this pandemic ends, one will be able to assess the health, social and economic impact of this global disaster and we should be able to learn lessons especially in terms of public and global health for any future similar pandemics.

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