



# CORONA VIRUS A DREAD TO THE WORLD

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## ABSTRACT

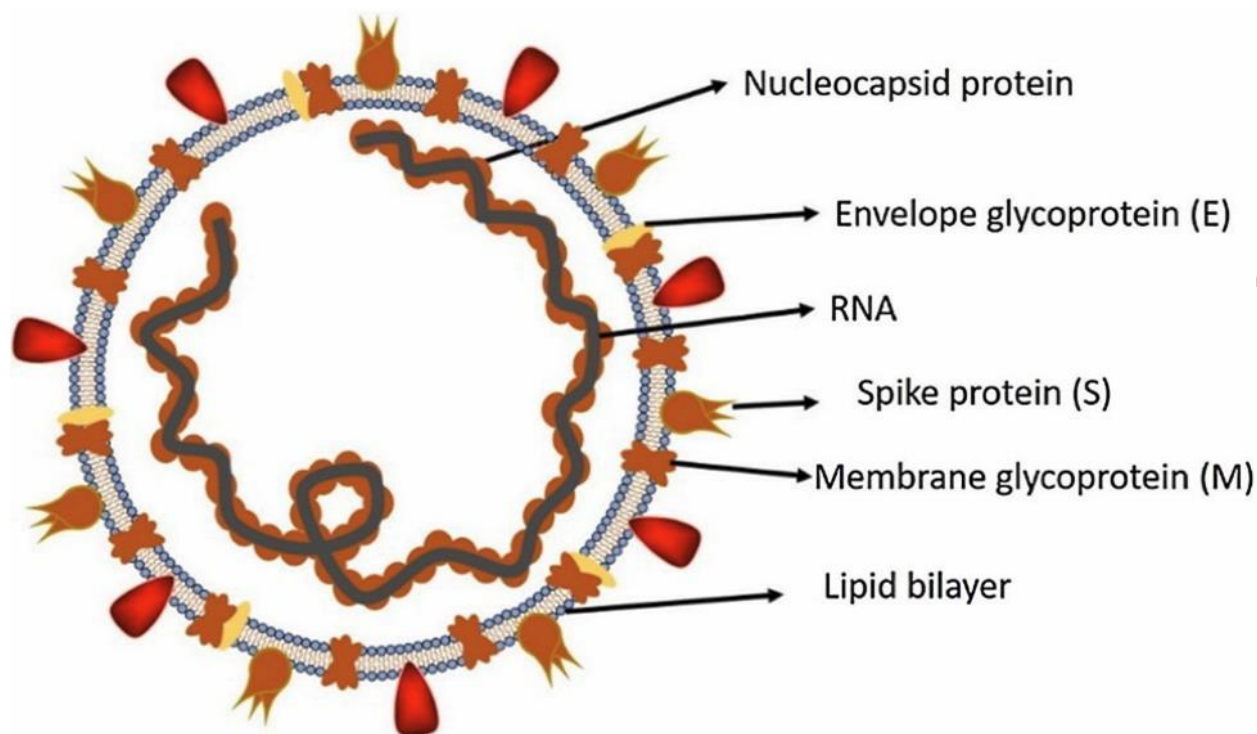
COVID-19 is a biggest threat world is facing now days from its emergence to reappearance of new strains of COVID-19. The viral disease though dreadful vaccine hope and its effectiveness is also a topic of research. Various vaccines are available in market for the treatment of COVID-19. In this article the summary of COVID-19 had been reported with WHO vaccine development and its optimistic use in treatment of COVID-19. Corona viruses (CoVs), enveloped positive-sense RNA viruses, are characterized by club-like spikes that project from their surface, an unusually large RNA genome, and a unique replication strategy. Corona viruses cause a variety of diseases in mammals and birds ranging from enteritis in cows and pigs and upper respiratory disease in chickens to potentially lethal human respiratory infections. Here we provide a brief introduction to corona viruses discussing their replication and pathogen city, and current prevention and treatment strategies. In the context of rapidly increasing outbreaks of COVID-19, proactive steps by long-term care facilities are required to recognize and eliminate potentially infected staff and visitors, actively track potentially infected patients and enforce effective infection prevention and control measures to prevent COVID-19. Scientific researchers conduct numerous clinical trials related to drugs that can be an important strategy because they promote the development of new classes of medicines and I hope these repositioning trials will help to identify alternatives for COVID-19 treatment.

**Key words:** COVID-19, Treatment, Prevention, Vaccines

## INTRODUCTION

Corona viruses are a group of related RNA viruses that cause diseases in mammals and birds. In humans and birds, they cause respiratory tract infections that can range from mild to lethal. Mild illnesses in humans include some cases of the common cold (which is also caused by other viruses, predominantly rhinoviruses), while more lethal varieties can cause SARS, MERS, and COVID-19. In cows and pigs they cause diarrhea, while in mice they cause hepatitis and encephalomyelitis.

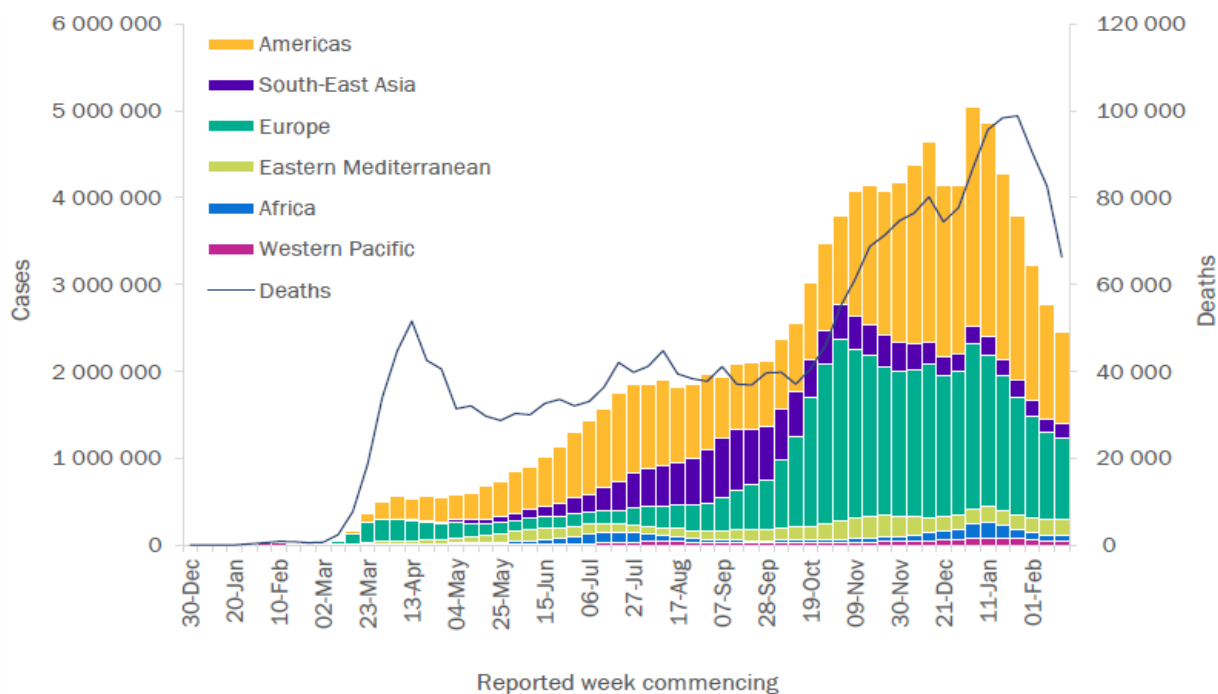
Coronaviruses constitute the subfamily *Orthocoronavirinae*, in the family *Coronaviridae*, order *Nidovirales*, and realm *Riboviria*.<sup>1-3</sup> They are enveloped viruses with a positive-sense single-stranded RNA genome and a nucleocapsid of helical symmetry.<sup>4</sup> The genome size of coronaviruses ranges from approximately 26 to 32 kilobases, one of the largest among RNA viruses.<sup>5-6</sup> They have characteristic club-shaped spikes that project from their surface, which in electron micrographs create an image reminiscent of the solar corona, from which their name derives.<sup>7</sup>



**Fig. no. 01: Structure of Corona virus**

## EPIDEMIOLOGY

As of 15 April 2020, 210 Countries and Territories around the world have reported over 1.998.111 confirmed cases and 126.604 deaths of COVID-19 and show the presence in six continents. According to WHO the number of cases and confirmed deaths has been shown below up to 23-Feb-2021



**Fig. no. 02: COVID-19 cases reported weekly by WHO Region, and global deaths**

### TRANSMISSION OF SARS-CoV

SARS-CoV is believed to be an animal virus that spread to other species (civet cats) and first infected humans in southern China's Guangdong province in 2002, from an as-yet-uncertain animal source, possibly bats<sup>8</sup>. SARS-CoV seemed to be the main mode of transmission via respiratory droplets as well as fecal-oral transmission may be <sup>9</sup>. Apart from the superspreaders, two to four secondary cases were estimated to infect every person. It was estimated that the median incubation duration was four to seven days<sup>10</sup> and that peak viral load was reached on the 10th day of illness. SARS-CoV may affect all age groupings. Particularly at risk were health care staff and immune-compromised patients<sup>11</sup>

### SYMPTOMS

Maximum of the patients infected with the virus will experience common cold and flu, while few of them remain asymptomatic. 80% of patient will show mild symptoms of the disease. Adults have the best immunity to fight against the infection but the demerit is that they are more likely to spread the infection A recent study of nearly 140 patients at the Zhongnan Hospital of Wuhan University identified different types of symptom, which lead to a disease known as COVID-19. 99% of the patients developed a fever with extremely high temperature, while more than half experienced fatigue and a dry cough. One-third of the patient developed a dry cough and difficulty in breathing.[9] Research from the Chinese CDC observes that around 80% of coronavirus cases are mild, around 15% of patients have infected severe cases, and 5% have become critically ill. A day by day breakdown of coronavirus symptoms shows how symptoms progress among typical patients, how the disease, COVID-19, goes from bad to worse.

Day 1: In the starting day of the symptom, the patient suffers from fever along with fatigue, muscle pain, and a dry cough. Few of them may experience nausea and diarrhea a few days before the arousal of symptoms.

Day 5: Patients may suffer from breathing problem especially if they are elderly or have some pre-existing health condition.

Day 7: According to the Wuhan University study, these are the symptoms of the patient that lead the patient to be admitted in the hospital.

Day 8: On the 8th day, patients (15%, according to the Chinese CDC) develop acute respiratory distress syndrome (ARDS), a condition where the fluid fills up in the lungs and this is mostly fatal. This usually happens in severe cases.

Day 10: The progression of the disease leads to worsening of the symptom and at this point the patient is shifted to ICU. Patients with milder symptoms probably have more abdominal pain and loss of appetite. Only a small fraction die. The current mortality rate is around 2%.

Day 17: On average, after two-and-a-half weeks patients who recover are discharged from the hospital. However, it's difficult to find out the symptoms in the earlier days of the infection. This is usually seen after 5-6 days.<sup>12</sup> Reported symptoms have ranged from mild to severe illness and death for confirmed coronavirus disease 2019 cases.

Emergency warning signs of COVID-19 needs medical attention immediately, continuous pain or pressure in the chest, include trouble in breathing, confusion and bluish lips or face. The progressed condition leads to Pneumonia<sup>13</sup> and the incubation period is yet to be determined as the virus is recently identified. As per the new information, symptoms could appear as soon as three days after exposure to as long as 13 days later. Recently published research found that on average, the incubation period is about five days

## **DIAGNOSIS OF COVID-19**

Diagnosis allows suspected people to understand that they are infected or not. Diagnosis can help them receive the care they need and it can help them take measures to cut back the probability of infecting others. People who don't know they are infected may not occupy at home and thereby risk infecting others. If the person develops symptoms of coronavirus disease 2019 and they have been exposed to the virus, he should consult to doctor. The doctor may decide whether to conduct tests for COVID-19 based on individual signs and symptoms. The doctor may also consider whether an individual had close contact with someone diagnosed with COVID-19 or travelled to or lived in any areas with ongoing community spread of COVID-19 within last 14 days.<sup>14</sup>

Coronavirus Disease-2019 tracking and diagnostic testing are critical and also critical to understanding epidemiology, informing case management, and to suppressing transmission. The Coronavirus disease outbreak is additionally typical to prevent virus community transmission, including how testing might be rationalized when lack of reagents/ testing kit or testing capacity necessitates prioritization of certain populations group or individuals for testing." (MA 3) To test for COVID-19, doctor or health practitioner may take samples, including a sample of saliva (sputum), a nasal swab and a throat swab, to send to a lab for testing or follow the directions of your local health authority.<sup>15</sup>

## Paper-Based Test COVID-19

As COVID-19 cases increase around all over the world so that the requirement of fast diagnoses needs and easy to handle diagnostic test procedure is becoming ever more pressing. A startup company spun out from MIT is now working on a paper-based test that may deliver results in less than half an hour. Early detection of COVID-19 is extremely useful to prevent spreading COVID-19. In this test a strip of paper is required that is coated with antibodies this is bind to a particular (COVID-19) protein. A second antibody is attached to gold nanoparticles, and therefore the patient's sample is added to a solution of these particles. Then the test strip is dipped in this solution. If the viral protein is present in the sample, it will be attaches to the antibodies on the paper strip as well as the nanoparticle-bound antibodies, and a coloured spot appears on the strip within 20 minutes. Currently, there are only two primary types of COVID-19 diagnostics method are available. First one is that test screens patient blood samples for antibodies against the virus. The drawback is that antibodies are often not detectable until a few days after symptoms begin. The second type of test looks for viral DNA in a sputum sample. It can detect the virus earlier in the infection, but they require polymerase chain reaction (PCR), to perform this method take more times (several hours) than screens patient blood test method.<sup>16</sup>

## Molecular Assays to Diagnose 2019-nCoV

Currently, several assays that detect the 2019-nCoV both in-house and commercially have been prepared or under development. Some assays may detect only the novel virus and a few can also detect other strains (e.g. SARS-CoV) that are genetically similar.<sup>17</sup>

## PREVENTION AND TREATMENT

WHO COVID-19 vaccine policy recommendations WHO relies on the Strategic Advisory Group of Experts on Immunization (SAGE) to issue policy recommendations on COVID-19 vaccination to Members States. Through an established methodological process rooted in evidence-based medicine, and with the support of a dedicated COVID-19 vaccine working group, SAGE has issued three sets of interim recommendations to date, covering: the Pfizer- BioNTech BNT162b2 vaccine , the Moderna mRNA-1273 vaccine , and the AstraZeneca – Oxford University AZD1222 vaccine. The last of these reviews examined AstraZeneca core clinical data from the Phase 1-3 clinical trials. The WHO interim recommendations that ensued apply to AZD1222 (named generically as ChAdOx1-S [recombinant]) vaccine against COVID-19, developed by Oxford University (United Kingdom) and AstraZeneca, as well as to ChAdOx1-S [recombinant]) vaccines against COVID-19 produced by other manufacturers. These include the Serum Institute of India and SK Bioscience (South Korea), both of which rely on the AstraZeneca core clinical data and have demonstrated equivalence in their regulatory review. It will be the responsibility of regulatory bodies and WHO's Emergency Use Listing (EUL) process to ensure that products emerging from different manufacturing facilities are equivalent. For each of these three vaccines, SAGE was able to issue policy recommendations because of the publication of appropriate data by the vaccine developers and on the basis that the vaccine was in the process of acquiring EUL from WHO or a marketing authorization from a stringent



regulatory authority, such as the European Medicines Agency. WHO assesses vaccines with a pathway to prequalification or EUL as they become available. In that context and under exceptional circumstances, WHO will review products with authorization from a regulatory authority considered by WHO as maintaining the highest of standards, even if EUL has yet to be confirmed, such as was the case for the Moderna and AstraZeneca vaccines. It should further be noted that EUL is a WHO time-limited regulatory recommendation based on a risk-benefit assessment of limited amount of quality, safety and efficacy data for use during a public health emergency. SAGE recommendations, on the other hand, are policy recommendations to guide ministries of health and their recommending bodies and disease programmes on the use of regulated products to optimize the individual and public health benefit of vaccines. The two sets of recommendations are complementary. WHO cannot comment or make recommendations on vaccines until the manufacturer in question has chosen to share the relevant data and allows SAGE, on behalf of WHO, to conduct a formal assessment. WHO urges all manufactures to share evidence to allow prompt review and guidance by designated WHO experts and advisory groups. SAGE does not usually make vaccine- or product-specific recommendations, issuing instead one recommendation that covers all vaccines for a given disease, unless the evidence suggests product-specific recommendations are needed. The current situation with respect to COVID-19 differs as a large variety of vaccines based on very different platform technologies is being developed, and data on the performance of each vaccine are still emerging. Products also have varying characteristics, including storage and handling requirements, such that some may be considered more suitable for certain settings than others. Consequently, SAGE is issuing product-specific recommendations for COVID-19 and will likely continue doing so for additional candidate vaccines. In the longer run, these recommendations may be regrouped into overall recommendations for COVID-19 vaccination. SAGE began to mobilize its evidence review and recommendation process for COVID-19 vaccination policy as early as the summer of 2020. An essential starting point to this process was the preparation and release of two critical documents forming the foundation for future vaccine-specific interim recommendations.<sup>18,19</sup> These consist of the WHO SAGE values framework for the allocation and prioritization of COVID-19 vaccination and the WHO SAGE Roadmap for Prioritizing Uses of COVID-19 Vaccines in the Context of Limited Supply, which jointly guide countries in their prioritization of target groups. The Roadmap highlights the importance of vaccinating frontline health workers and older people with and without comorbidities first, and outlines how additional groups can then be vaccinated as more vaccine becomes available, in keeping with the local epidemiological context.<sup>20</sup> The Roadmap also encourages national programmes to consider groups that are disproportionately affected by the pandemic and to continuously base vaccination decisions on a thorough risk benefit assessment. For all three vaccines reviewed to date, SAGE concluded that the known and potential benefits outweigh the known and potential risks. The high efficacy of each of the products was acknowledged, despite insufficient data on if and how these vaccines impact virus transmission, although it is likely there will be some level of protection against transmission. These vaccines will have a beneficial effect on the high rate of severe disease and mortality caused by SARS-CoV-2 infection, a key objective of vaccination. More work

is needed to understand if this is the case for all circulating variants of concern. Based on current data for each of these three vaccines, a regimen of 2 full doses of the same vaccine is recommended, injected intramuscularly in the upper arm. This means the dosage cannot be reduced, or interchanged (i.e., if the first dose is Pfizer-BioNTech vaccine, the second should not be Moderna or AstraZeneca vaccines). There are multiple reasons for this, including a lack of research so far on interchangeability. Furthermore, each vaccine has a different minimum interval time between doses: a second dose of the Pfizer-BioNTech vaccine can be administered after three weeks; the Moderna vaccine requires a minimum interval of four weeks, which can be extended to six weeks; and the AstraZeneca vaccine requires an interval of no less than eight weeks which can be extended to twelve. This latter WHO recommendation deviates slightly from the vaccine developers, who have determined the product is sufficiently efficacious when a second dose is administered after four weeks. SAGE preferred to recommend a longer interval for the AstraZeneca vaccines based on the evidence that supported an improved vaccine performance (for efficacy and immunogenicity) when delaying the second dose by a few weeks. With all three vaccines, it is recommended that the administration of any other vaccines against other conditions be held off for at least two weeks after vaccination against COVID-19, until data on co administration become available. The minimum recommended ages for COVID-19 vaccination vary only slightly between the three vaccines and SAGE confirmed there is no upper limits for any of the three vaccines. These conclusions were based on available data and will evolve when more efficacy and safety data become available. The same evidence scenario applies for specific populations such as pregnant or lactating women, as well as persons with compromised immune systems or living with HIV. For each of these groups, there is no reason to believe the vaccine would be harmful – especially since these are not vaccines containing live viruses which can replicate; however, more evidence is being sought in order to further inform WHO policy recommendations. Whenever possible, potential vaccine recipients should be informed and counselled in relation to the available data and a risk-benefit assessment of their individual case. It should be clarified that, while recommendations exist for these profiles, there are no current COVID-19 vaccination recommendations for children and adolescents.

## CONCLUSION

COVID-19 is a most dreadful disease which not only hammers the human beings but also creates wide impact on economic conditions worldwide. New variant of COVID 19 is also making it difficult to control the situation in various countries. WHO had approved emergency use of vaccines few of them are efficient in generating immunity against the novel corona virus. Herbal treatment can also be proved effective in treating Covi- 19 as per the guidelines of ICMR.

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