



REVIEW OF WORLDWIDE PANDEMIC SITUATION OF COVID-19 ACTIVITIES FROM BEGINNING 2019 TO CURRENT SCENARIO – 2022

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ABSTRACT

We all know from the last three years, how the whole world fought with an epidemic situation like Covid-19 and many countries are still affected. Whole had to face lock down, this had to face the problem of economic, financial, hunger and jobs etc. due to this infection. COVID-19 is spreading all over the world, and you can say that it is a worldwide infectious disease. In humans, corona viruses to cause respiratory infections range from the general cold to further severe disease such as the Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The most newly discovered coronavirus causes coronavirus disease COVID-19. New virus and disease were unidentified prior to the eruption in Wuhan, China, in December 2019. They are transmitting from one host to another host, depending on the corona virus species, by either an aerosol and fecal-oral route. Now various peoples are dying day by day, the whole world from this virus. During the pandemic situation, some scientists have discovered vaccines successfully and tried it on some peoples by China then Russia Countries. India has also discovered effective vaccines such as, Covaccine and Covishield and these vaccine doses are in three steps first, second and booster. It is used for all people from the ages of 18 to old ages. These vaccines are working effectively according to these countries with successful results. After that, all types of vaccines are approved and continuously used in the whole world and it is controlled by the infections from corona virus and life is controlled from it. At present scientists working for other vaccines which will be use for children under the age of 18 year old. The main precaution of this virus is two meter distance and wears mask and sterile hands which are continuously talked about by WHO and governments by all countries. So the present review study we have discussed about infection of corona virus and its pandemic activity worldwide, same as we have discussed its structure and replication process, transmission precaution and vaccination on this study.

KEYWORDS: Covid-19, Replication, Pandemic infection, Vaccination.

INTRODUCTION

The Corona Virus is a worldwide transmittable disease. These viruses are first identified by virologist J.D. Almeida, C.H. Cunningham and D.M. Berry et al.^[1] This virus is also known as COVID-19. It is a large family of viruses which cause sickness in humans and animals. In humans, corona viruses to cause respiratory infections range from the general cold to further severe disease such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The most newly discovered corona virus causes corona virus disease COVID-19. New virus and disease were unidentified prior to the eruption begin in Wuhan, China, in December 2019. It is caused pandemic affecting to all worlds.

The most common symptoms of COVID-19 are dry cough, fever, and tiredness. Symptom that are less common and may affect some patients include aches and

nasal congestion, pains, conjunctivitis, headache, diarrhea, sore throat, loss of taste or smell, skin rashes, discoloration of fingers and toes. These symptoms are typically gentle and frequently.^[2]

In a timeline that reaches the present day, an epidemic of cases with mysterious low respiratory infection detected in Wuhan, the major urban region in China's Hubei, was first given to WHO Country Office in China, in 31 December 2019. The etiology of this illness is now credited to a novel virus belong to the family of corona virus (CoV).^[3] The CoVs have become the major pathogens of promising respiratory disease outbreaks. It is a large family of single-stranded RNA viruses that can be isolated in different kind of animals.^[4] Now various peoples are died day by day, whole world from this virus. So the present review study we have discuss about infection of corona virus and its pandemic activity on worldwide, same as we have discussed its structure and

replication process, and also transmission with precaution in this study.

STRUCTURE OF CORONA VIRUS (COVID-19)

Corona viruses are large shape, spherical like structure; irregularly changeable shape, his particles with globular surface like projections^[5] and the typical diameter particles is around 125 nm. With its envelope is 85 nm and the spikes are 20 nm long.^[6,7] See the Figure number -1.^[8] The surfaces of coronavirus are spikes and homotrimers of the S protein, which is composed of an S1 and S2 subunit. The S1 subunits form the head of the

spike contains the receptor binding domain (RBD). The S2 subunit forms the branches which anchor the spike in the viral envelope and on protease activation enable combination. The E and M protein are important in forming the viral envelope and maintaining its structural shape.^[9] Inside the envelope is the nucleocapsid, which is twisted from numerous copies of the nucleocapsid (N) protein, which are bound to the positive-sense single-stranded RNA genome in a continuous beads-on-a-string type conformation.^[10] The membrane proteins, lipid bilayer envelope, and nucleocapsid protect the virus while be exterior the host cell.^[11]

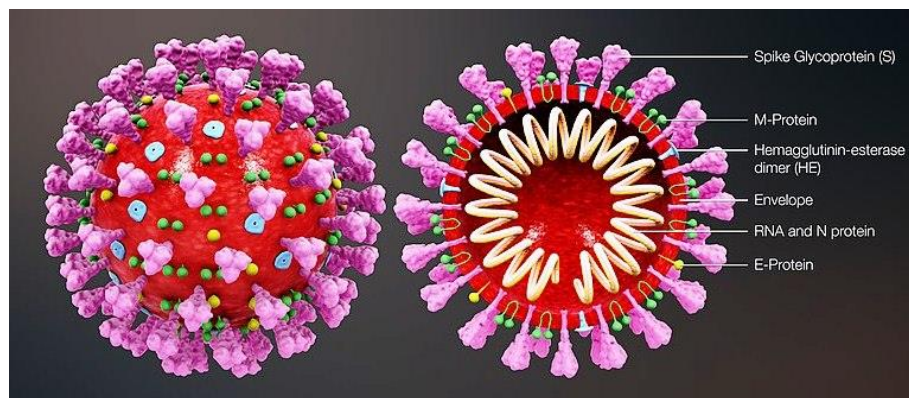


Figure-1: Structure of corona virus^[8]

REPLICATION OF CORONA VIRUS (COVID-19)

The Entry

This Virus begins while viral spike (S) glycoprotein attaches to its complementary host cell receptor. After attachment, protease of the host cell cleaves and activates the receptor-attached spike protein. It has depending on the available host cell protease, cleavage and creation allows the virus to enter the host cell by endocytosis or direct fusion of the viral envelop with the host membrane.^[12]

Nonstructural proteins unite to form a multi-protein replicase-transcriptase complex (RTC). RNA-dependent RNA polymerase is directly implicated in the replication, and transcription of RNAs of an RNA strand.^[13] Introverted of the main function of the intricate is to replicate the viral genome. RdRp straight mediate the separation of negative-sense genomic RNA from the positive-sense genomic RNA.^[14] Other significant of the complex is to set down the viral genome. RdRp directly mediates the separation of negative-sense sub genomic RNA molecules from the positive-sense genomic RNA. This is follow by the transcription of these negative-sense sub genomic RNA molecules to their parallel positive-sense mRNAs.

The Release

The imitation positive-sense genomic RNA became the genome of the offspring viruses. The mRNAs are gene

transcripts of the previous virus genome behind the initial overlap analysis framework. These mRNAs are translated by the host's ribosome interested in the structural proteins, and an amount of accomplice proteins.^[15] RNA translations occur inside the endoplasmic reticulum. The viral structural proteins S, E, and M move beside the secretory pathway into the Golgi intermediate compartment. There, the M proteins straight mainly protein protein interactions required for the assembly of viruses following its binding to the nucleocapsid. Young viruses are then released from the host cell by exocytosis during secretory vesicles.^[16]

Transmission of COVID-19

Unhygienic carriers are able to shed viruses into the environment. The edge of the corona virus spike protein with its paired cell receptor is central in formative the tissue tropism, infectivity, and species variety of the free virus.^[17, 18] They are transmitting from one host to another host, depending on the corona virus species, by either an aerosol and fecal-oral route.^[19] These human viruses transmit a disease to the epithelial cells of the respiratory tract; while in animal corona viruses typically transmit a disease to the epithelial cells of the digestive tract.^[20] The human epithelial cells of the lungs by binding to the angiotensin-converting enzyme like 2 (ACE2) receptor.^[21] See the figure number -2.^[22]

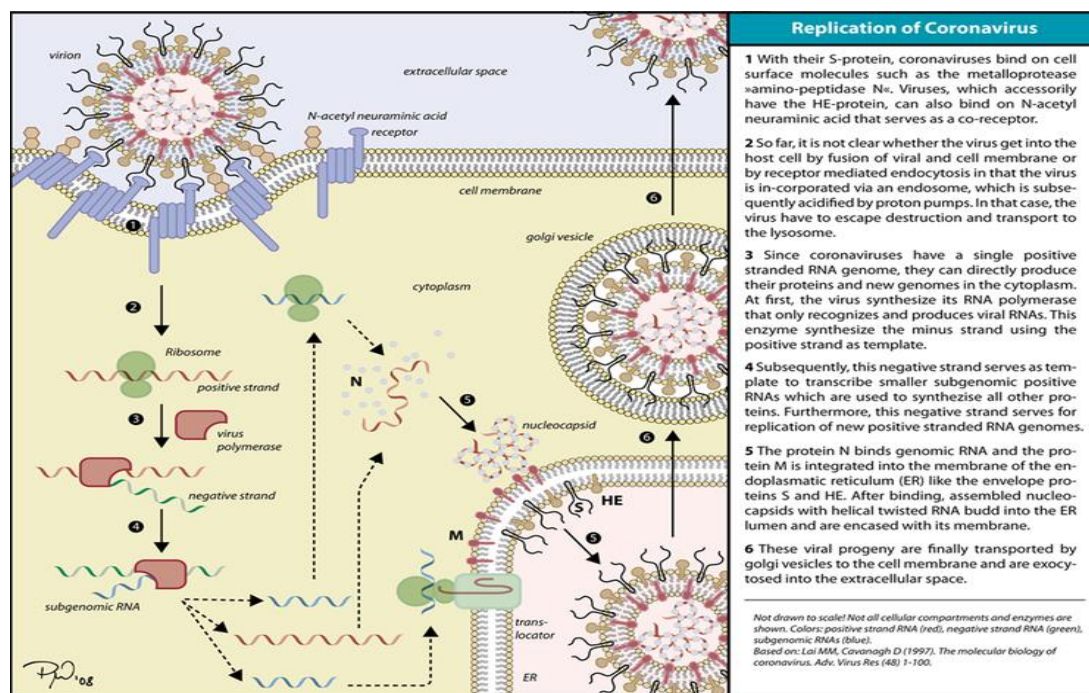


Figure 2: Replication of Corona Virus.

EPIDEMIOLOGY OF CORONA VIRUS (COVID-19)

In the early hours efforts contain aware on important the clinical course, counting severe cases, and treating the sick. Experience with the Middle East respiratory syndrome (MERS), pandemic influenza, and new outbreak have ready to recognize with the intention of epidemic evolve, we look a vital require to increase public fitness actions to explain the epidemiology of the novel virus and characterize its probable force. The impact of an epidemic depends on the number of people impure, the infection's transmissibility, and the variety of clinical strictness.^[23, 24]

The first case of corona virus disease 2019 (COVID-19) was reported in Wuhan, China at December 2019, during epidemic of viral pneumonia. A firstly local epidemic has since rapidly extended to a worldwide pandemic affecting at least 124 countries with important morbidity and mortality. At the time of this writing, the full scale of the public health impact has not been fully resolute. More than 438,749 patients have been infected worldwide (55,243 U.S) and 19,675 have died.^[25]

ETIOLOGY

The Corona viruses (COVID-19) are cause by a novel, enveloped of single-stranded RNA virus namely, Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2). SARS-CoV-2 is the seventh recognized corona virus in humans and belongs to the similar phylogenetic family as the 2002 SARS and the 2012 Middle East Respiratory Syndrome corona virus (MERS-CoV-2). The SARS-CoV-2 is alleged however do not definite to have originated in bat given a significant (89-96%) genomic homology to bat corona viruses. MERS-CoV-2 and SARS-CoV-2, the culprit of the two respiratory viral

epidemics of past two decades, also emerge from bats and contaminated camels (MERS-CoV-2) and civets (SARS) during spreading to peoples.^[26]

SYMPTOMS OF CORONA VIRUS (COVID-19)

The most common symptoms include fever (82.2 %) and cough (61.7 %).^[27-30, 31, 32] These symptoms are related to viral respiratory disease. Until now, the exterior of sore nausea, vomiting, throat and diarrhea may advise one more infection in its place. Viral respiratory co-infection is a singular.^[33, 34-37] See the Table-A.

Table-A.

Rate of Symptoms Seen with COVID-19 Cases		
S. No.	Symptoms	Rate
1	Fever	82.20%
2	Cough	61.70%
3	Fatigue	44.00%
4	Dyspnea	41.00%
5	Anorexia	40.00%
6	Productive Sputum	27.70%
7	Myalgia	22.70%
8	Sore Throat	15.10%
9	Nausea	9.40%
10	Dizziness	9.40%
11	Diarrhea	8.40%
12	Headache	6.70%
13	Vomiting	3.60%
14	Abdominal Pain	2.20%

CAUSES OF CORONA VIRUS (COVID-19)

The virus appears to spread easily among people, and more continues to be exposed above time regarding how it spreads. Data have shown that it spreads from person to person with those in close contact within about 1.83

meters, and also 2 meters. The virus spreads by respiratory droplets out when someone with the virus coughs, sneezes or talks. Furthermore, it is multiply to person touch on surface with the virus, and then touch of nose or eye and mouth.^[38]

RISK FACTORS DESIGNED FOR CORONA VIRUS (COVID-19) EMERGE TO CONTAIN

- Recent travel from or residence in the region with ongoing community spread of COVID-19 as determined by CDC or WHO.
- Close contact with someone who has COVID-19, such as being within 1.83 meters, or 2 meters, or being coughed on which can occur when a family member or health care worker take care of an infected person.^[38]

THE DIAGNOSIS OF CORONA VIRUS (COVID-19)

A. Emerging Diagnostic test for COVID-19

According to the WHO, the direct priority for COVID-19 diagnostics research is the development of nucleic acid and protein tests, and detection at the point-of-care.^[39] Longer-term priority put together these tests into multiplex panels. Here classifies to recover supervision efforts, serological tests by the proteins are needed in addition to nucleic acid tests. These tests have the profit of detection after recovery, disparate nucleic acid tests. This enables clinicians to track both sick and improved patients, providing a better estimate of total SARS-CoV-2 infections. Point-of-care tests are cost-effective, handheld devices used to diagnose patients outside central facilities. These can be operating in areas like society to shrink the weight on clinical laboratories.^[40]

B. Viral RNA detection

The most important test has concerned directly detect SARS-CoV-2 viral RNA throughout PCR. The first quantitative reverse transcript PCR tests (RT-qPCR) for SARS-CoV-2 were designed and distributed to laboratories about the world in January by WHO. While, the density and cost of these widespread tests has necessitated the growth of another PCR-based testing strategy on more localized levels. Further, known with the intention of such tests are still very new to the scene, it is vital to note that the true clinical sensitivity is a indefinite; then a negative test does not reverse the risk to individual is infected.^[41]

C. Serological tests

A rising crowd of tests is persons to detect immunoglobulins, normally in the blood. Such assays exploit antibody-antigen recognition in classify to resolve whether the host has been expose to the virus. As more people contract, and then improve from the disease, these tests can assist cover a picture of the viral spread amid populations and deal with social restrictions from side to side provides remarkable information about a viral spotlight, as well as diagnostic facts. Whereas these serological tests have vast probable in tracing the virus,

they are still organism developed. They obtain longer to take exposed with formerly partial in accessibility. Since companies persist to develop immunoassays for the Corona Virus (COVID-19), further research will be mandatory to use. Many tests need to be consistent on a worldwide level to present the best information.^[41]

VACCINES AND VACCINATION

China has approved the vaccine CanSino against coronavirus and it is trial for military use in limited numbers, and more than two more virus vaccines which have to be inactivated for urgent situations to be used in high-risk occupations in 24 June 2020.^[42] After the Russian country produced new vaccine which is Sputnik V and was also be used for control of the crisis, and after one month his scientist used only little doses of the vaccine had been dispersed for the peoples during phase three trials in 11 August 2020,^[43] In 20 November 2020 the company of BioNTech –Pfizer are jointly submitted an Emergency Use Authorization (EUA) requested to the U.S. Food and Drug Administration (FDA) for the mRNA vaccine BNT162b2 (active component tozinameran).^[44, 45] In 16 January 2021 the India began regulation of COVID-19 vaccines. From 1 August 2022, India has administered over 2.04 billion doses overall, including first, second and booster doses of the currently approved vaccines.^[46, 47] Total 94% of the eligible population (12+) has received at least one shot, and 86% of the eligible population (12+) is fully vaccinated in India.^[48, 49] The Russian government announced to they have registered the first COVID-19 vaccine for animals in 31 March 2021^[50] and the name is Carnivac-Cov, it is an inactivated vaccine for carnivorous animals, aimed at preventing mutations that occur for the duration of the interspecies transmission of SARS-CoV-2.^[51]

Some vaccine like Oxford–AstraZeneca which are manufactured under license by Serum Institute of India under the trade name Covishield and Covaxin are developed by Bharat Biotech and these vaccines are approved by India. They have since been joined by the Sputnik V which is manufactured under license by Dr. Reddy's Laboratories, with additional production from Serum Institute of India being started in September^[52,53], Moderna vaccines, Johnson & Johnson vaccine and ZyCoV-D these vaccines are locally developed by Zydus Cadila^[54,55] and other vaccine candidates undergoing local clinical trials. These vaccines are working effectively according to these countries with successful results. After that, all types of vaccines are approved and continuously used in the whole world and it is controlled by the infections from corona virus and life is controlled from it. At present scientists working for other vaccines which will be used for children under the age of 18 year old. The vaccination report by world Health Organization, Globally, as of 7:45pm CEST, 18 October 2022, there have been 622,389,418 confirmed cases of COVID-19, including 6,548,492 deaths, reported to WHO. As of 11 October 2022, a total of 12,782,955,639 vaccine doses have been administered.^[56] Children will

be given a Pfizer or BioNTech vaccine for their COVID-19 vaccination. Children aged up to 5 to 11 or 12 if they are in school Year 7 will be given smaller doses than older children and also for adults. They can cause some side effects in children, but not everybody gets them. Any side effects are usually mild and should only last 1 or 2 days, such as: Feeling tired Feeling achy, Normal flu, Headache and Sore arm from the injection.^[57]

According to World health Organization on 8 April 2022, have evaluated that the following vaccines against COVID-19 have met the compulsory criteria for safety and worth^[58]

1. AstraZeneca/Oxford vaccine
2. Johnson and Johnson
3. Moderna
4. Pfizer/BionTech
5. Sinopharm
6. Sinovac
7. COVAXIN
8. Covovax
9. Nuvaxovid
10. CanSino etc.

PREVENTION OF CORONA VIRUS (COVID-19)

- To avoid meeting other peoples with anyone who is sick or have symptoms and keep distance between 2 miters.
- Stay home if probable and keep your distance.
- Keep away from big events like, seminars, functions, conferences, and mass gatherings, etc.
- Wrap your face with a cloth face covering in public spaces, particularly if you're in an area with continuing population spread.
- Don't touch your eyes, nose and mouth.
- Clean and sanitize high-touch surfaces daily.
- Mostly wash your hands at least 20 seconds from alcohol-based hand sanitizer, and you can also use any other shop.
- To avoid winning public transportation if you're sick.^[59]
- Covid-19 vaccines also take pregnant women. It's totally safe.
- No side effects of covid19 vaccine are used for all people.

CONCLUSION

We all know from the last three years, how the whole world fought with an epidemic situation like Covid-19 and many countries are still affected. Due to which the whole had to face lock down, which had to face the problem of economic, financial, hunger and jobs etc. but now this virus is in our possession due to the making of corona vaccines and its uses by camping which are continuously organized by the government. The main precaution of this virus is two meter distance and wears mask and sterile hands which are continuously talked about by WHO and governments by all countries. During the Covid 19 infections various type of pathological tests and vaccines are developed by many countries and it is

giving successful results. As we are facing this global challenge and struggle to influence the power of testing, it's imperative to distinguish that we still have a way to go in sympathetic to the virus itself. In the present scenario this pandemic situation is under the control condition of these protocols.

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 56. https://covid19.who.int/?adgroupsurvey={adgroupsurvey}&gclid=CjwKCAjwwL6aBhBIeiwADycBILkHa66WNVAXHUGlcBY2vpjjUGg1CRxRaRZo61zArS2clqHj9qYWhoCoYEQA_vD_BwE.
 57. <https://www.nhs.uk/conditions/coronavirus-covid-19/coronavirus-vaccination/coronavirus-covid-19-vaccination-for-children/coronavirus-covid-19-vaccine-for-children-aged-5-to-15/>
 58. <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/covid-19-vaccines/advice>
 59. Corona virus disease 2019 (COVID-2019). U.S. Centers for Disease Control and Prevention. <https://www.cdc.gov/coronavirus/2019-ncov/index.html>. Accessed April 17, 2020.