

## Protocol for Medicine and Technology for COVID-19 - A Mini Review

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### ABSTRACT

The global Corona virus pandemic has brought in a lot of issues, concerns and challenges to humanity and the ecosystem. There is a medical emergency to take up strict measures to slow or stop the spread of this virulent pathogen SARS-CoV-2, the virus that causes COVID-19 which is a new variant indicating its origin to the Wuhan city of China. People across nations have been experiencing all the economic and psychological consequences due to this outbreak, and the whole world has joined hands in eradicating this deadly disease. A lot of awareness schemes are being undertaken by many countries and organizations, to not only control the infection but also to revive normalcy. This article provides valuable information about the cause, symptoms, diagnosis, treatment protocols, counseling support systems, innovation strategies, etc., all to ensure that we overcome this crisis and spring back to our healthy routines.

**Keywords:** COVID-19, SARS-CoV-2, WHO, Vaccine, Treatment, Technology.

### 1. Introduction

The new corona virus disease has got unusual spreading properties and is causing high rate of death. All over the world, the governments of different countries started issuing public laws such as social distancing, isolation, self-quarantine, lock down etc. [1]. A psychological part of SARS-COV-2 infection is dread, which is characterized as a horrendous passionate express that is set off by the view of compromising upgrades. What astonished is, the pandemic now, (is not from loans, or finance) but from a virus; it is important to note that, medical community that recovery will be only possible when effective vaccine is offered [2].

#### 1.1 Symptoms of human infection

Symptoms of human infection by COVID-19 at the prodromal phase such as Malaise, dry cough and fever are not specific for COVID-19 [3]. It is surprising to see that, the human upper respiratory track is very much far from this frequent effect of the virus. From several reports published all over the world, the most common symptoms for a person who is infected with COVID-19 are lymphopenia and trilateral ground-glass opacity, along with certain chest issues [4].

#### 1.2 A brief of SARS-COV-2

There was an ally that the origin of SARS-COV-2 was bats [5]. A dominant part of the general public has concurred that, keeping up well-being and cleanliness, covering the nose and mouth while coughing and maintaining a strategic distance from patients who are debilitated could assist with forestalling the COVID-19 transmission. There was a positive reaction from a lot of doctors that, this infection could prompt pneumonia, disappointments of respiratory framework and passing and the consideration is the main treatment which is accessible right now [6].

## **2. Clinical severity**

Clinical Management Protocol: COVID-19 has been issued by the Ministry of Health and Family Welfare Directorate General of Health Services (EMR Division) Version 3, dated 13.06.2020 is as follows [7]

## **3. Diagnosis, Laboratory and Radiographic Findings**

### **3.1 Diagnosis & Sample Collection**

**Preferred sample:** Throat and nasal swab in viral transport media (VTM) and shipped in cool chain [8].

**Alternate:** Nasopharyngeal swab, bronchoalveolar lavage (BAL) or endotracheal suction which must be blended in with the viral vehicle medium and shipped in chilly chain.

Direction on example assortment, preparing, transportation, including related biosafety techniques, is accessible at: [https://www.mohfw.gov.in/pdf/5Sample%20collection\\_packaging%20%202019-nCoV.pdf](https://www.mohfw.gov.in/pdf/5Sample%20collection_packaging%20%202019-nCoV.pdf)

### **3.2 Laboratory Findings**

Lymphopenia is the most well-known laboratory finding in COVID-19, and is found in the same number of as 83% of hospitalized patients [9, 10]. Lymphocytopenia is frequently because of AIDS or undernutrition, yet it additionally might be acquired or brought about by different contaminations, drugs, or immune system issues. Patients have repetitive viral, contagious, or parasitic contaminations. Lymphopenia, neutrophilia, raised serum alanine aminotransferase and aspartate aminotransferase levels, raised lactate dehydrogenase, high CRP, and high ferritin levels might be related with more noteworthy disease seriousness [11].

### **3.3 Radiographic Findings**

Chest radiographs of patients with COVID-19 ordinarily exhibit respective air-space union, however patients may have unremarkable chest radiographs from the get-go in the disease [9, 10]. Chest CT pictures from patients with COVID-19 ordinarily exhibit respective, fringe ground glass opacities [12, 13]. Since this chest CT imaging design is vague and covers with different contaminations, the demonstrative estimation of chest CT imaging for COVID-19 might be low and ward upon radiographic translation [14].

## **1. Treatment Protocols**

There are certain steps involved in the management of COVID-19 patients.

- The period of Incubation for COVID-19 is 14 days, which is a median time of around five days from exposure to symptoms.
- The following are few most common symptoms: Fever, cough, fatigue, shortness of breath, Expectoration, Myalgia, Rhinorrhea, sore throat, diarrhea, Loss of smell (anosmia) or loss of taste (ageusia) preceding the onset of respiratory symptoms etc [15].
- There are strict practices like social distancing and implementing nationwide Lockdowns.
- Real time polymerase chain reaction (PCR) test and point of care molecular diagnostics.

- Antibody tests (In general, a positive antibody test is presumed to mean a person has been infected with SARS-CoV-2, the virus that causes COVID-19, at some point in the past. It does not mean they are currently infected).
- Pool testing.
- The significant risk factors for extreme illness are: Age over 60 years (expanding with age) and Underlying non-transmittable maladies (NCDs): diabetes, hypertension, cardiovascular sickness, ceaseless lung ailment, cerebro-vascular ailment, incessant kidney infection, insusceptible concealment and malignant growth [7].

However, presently there is neither any vaccine nor any specific antiviral drug existing [16].

### *Asymptomatic treatment*

A few examinations have archived COVID-19 disease in patients who never create side effects (asymptomatic) and in patients not yet suggestive (pre-symptomatic) [17, 18]. Since asymptomatic people are not routinely tried, the predominance of asymptomatic contamination and discovery of pre-indicative contamination isn't yet surely known. One examination found that the same number of as 13 % of Reverse transcription polymerase chain reaction (RT-PCR)- affirmed instances of SARS-CoV-2 contamination in youngsters were asymptomatic. Asymptomatic cases form 70-80 % of COVID patients. They have very less or no symptoms but test positive for COVID-19 infection.

Few preventive measures to be kept in mind while caring for SARS-CoV-2 patients with no or mild symptoms at home:

- Nutritious diet with plenty of fruits and vegetables and warm fluids.
- Multivitamin with zinc and vitamin C daily for 10 days
- Careful disposal of food plates.
- Proper hygienic such as wearing N95 masks all the time at home and washing hands frequently with soap and water, or using good hand sanitizers.
- Regular check of temperature and spo2 (blood oxygen saturation level) monitoring and informing health authorities if they have low saturation (less than 94 %) or high temperature. (The American College of Critical Care Medicine and Infectious Disease Society characterize fever as center internal heat level more prominent or equivalent to 38.3° C. Pleasant consider a baby or youngster has a fever if their temperature is 38 °C or higher [19]. Studies demonstrate that solitary portion of the patients with positive SARS-CoV-2 infection present with internal heat level (BT) > 37 °C at the underlying introduction. Be that as it may, temperature rise is normal, and high greatest temperature over the span of SARS-CoV-2 contamination was a noteworthy harbinger of helpless results. Actually, one of every three patients arriving at a most extreme BT above 39.5 °C kicked the bucket. This was around a 5-overlap increment in death rate when contrasted

with patients whose temperature never broke 37 °C. Interestingly, practically 50% of the patients at first giving low BT < 35.5 °C died [20]).

- A systematic review of normal body temperature found that older adults (age  $\geq 60$ ) had a lower temperature than younger adults (age <60) by 0.23°C, on average.
- Strict home isolation with no contact with any family member, only one person to be available for giving them food and clothes with adequate distance maintenance of 3 feet.
- COVID-19 is a new disease and there's still a lot that is unknown about this illness and the virus that causes it. However, staying updated on current development and taking all possible measures can help us stay safe.

### ***Management of mild cases, moderate cases and severe cases***

The National Institutes of Health have published guidelines for the management of COVID-19 patients for prophylaxis. The recommendations were focused on scientific evidence and advice from experts, and will be updated as more data becomes available. For more information, please visit National Institutes of Health: COVID-19 Treatment Guidelines (<https://www.covid19treatmentguidelines.nih.gov/>).

Government of India, Ministry of Health and Family Welfare Directorate General of Health Services (EMR Division) has issued Clinical Management Protocol: COVID-19, Version 3, dated 13.06.2020 in this regard [<https://www.mohfw.gov.in/pdf/ClinicalManagementProtocolforCOVID19.pdf>].

### ***Pediatric Management***

Sickness among pediatric patients with COVID-19 is normally milder than among grown-ups. Most youngsters present with indications of upper respiratory contamination. Be that as it may, extreme results have been accounted for in youngsters, including passings. Information propose that newborn children less than 12 long stretches old enough might be at higher hazard for extreme ailment from COVID-19 contrasted and more established kids [21].

### ***2. Perceptions/Safety measures of COVID-19***

There was a mixed perception of positives and negatives about Covid-19. The major thing is that the patients, who are ill, have to share their recent travel history. Also, there was a perception that the vaccine given for flu, pneumonia such as pneumococcal vaccine and Haemophilus influenza type B (Hib) vaccine can prevent COVID-19, which is not true. They do not provide protection against the new coronavirus and also COVID-19 is not a case where a person might get fatal. The symptoms of this COVID-19 appear as early as 2 to 14 days [22].

The World Health Organization (WHO) has described 4 levels of COVID-19 transmission. These are countries with:

- Not a single case report [COVID-19 free].
- Sporadic cases.
- Clusters of cases.

- Community Transmission.

It has been 7 months almost of this spread now. We should now at least wake up and check out how we can eradicate this virus. This Corona virus pandemic has now been a dangerous pandemic, spreading human to human transmission via the droplets, which occur by symptoms like coughing, sneezing etc. As per WHO and all other medical associations, we should avoid contact with sick people [23]. The Anti Malarial drug is just been a recommendation to use, which is not the ideal vaccine. Also another important thing is to note that this drug was not recommended for kids. Another big implement was the inhibit effect of Hydroxychloroquine (HCQ). But, there has been a report of cardiovascular adverse outcome of the HCQ intervals.

All the medical organizations across the world are now giving their best to create activated vaccine development. Many countries have launched mobile applications which have been acting as an informative tool to give out awareness on Coronavirus, within the public. In India, the “Arogya Setu” has been a milestone application, showing considerable positive results [24].

We can reduce our chances of being infected or spreading COVID-19 by maintaining a strategic distance from possible hazard:

- Consistently and absolutely cleaning hands with a liquor based hand rub or wash them with chemical and water. Washing our hands with chemical and water or utilizing liquor based hand rub butchers sicknesses that might be on our hands.
- Keeping up at any rate 1 meter (3 feet) detachment among ourselves just as others. Exactly when someone hacks, wheezes, or talks they sprinkle minimal liquid dots from their nose or mouth which may contain contamination. If we are unreasonably close, we can take in the globules, including the COVID-19 disease if the individual has the ailment.
- Abstain from going to amassed places. Where people get together in swarms, we will undoubtedly come into close contact with someone that has COVID-19 and it is progressively difficult to keep up physical division of 1 meter (3 feet).
- Abstain from reaching eyes, nose and mouth. Hands contact various surfaces and can get diseases. At the point when contaminated, hands can move the disease to our eyes, nose or mouth. Starting there, the disease can enter our body and pollute us
- Guaranteeing ourselves, and the individuals around us, follow incredible respiratory orderliness. This surmises covering the mouth and nose with bowed elbow or tissue when we hack or wheeze. By then discarding the pre-owned tissue quickly and washing our hands. Spots spread sullyng. By following inconceivable respiratory orderliness, we shield the individuals around us from pollutions, for example, cool, influenza and COVID-19.
- Remaining at home and self-separate even with minor signs, for instance, hack, headache, smooth fever, until we recover. Have someone bring us supplies. If we need to go out, wearing a spread to keep away

from sullyng others. Keeping up a key good ways from contact with others will shield them from possible COVID-19 and various contaminations.

- On the slim chance that we have a fever, hack and bother breathing, look for clinical idea, at any rate call by phone early if conceivable and follow the headings of our neighborhood flourishing power. National and near to masters will have the most current data on the condition in our general district. Bringing early will permit us remedial organizations supplier to rapidly control us to the correct success office. This will additionally promise us and assist foil with spreading of defilements and different ailments.
- Staying with the most recent on the latest information from trusted in sources, for instance, WHO or our neighborhood and national prosperity masters. Neighborhood and national experts are best situated to admonish on what people in our overall region should do to make sure about themselves.

### ***3. Counseling support system***

These can be troublesome occasions for us all as we catch wind of spread of COVID-19 from everywhere throughout the world, through TV, online networking, papers, loved ones and different sources. The most widely recognized feeling looked by everything is Fear. It makes us on edge, panicky and can even make us think, say or do things that we probably won't consider suitable under typical conditions.

#### *Handling emotional problems:*

On occasion of tension, work on breathing gradually for a couple of moments. There has been a lockdown and people have remained inside their homes for the past 4 months. There are certain attitudes like feeling desolated, feeling alone, depressed etc. The following are some points which can be considered during such situation:

- Remaining associated with home members.
- Corresponding with our loved ones can assist you in this time.
- Calling up individuals in the family with whom we haven't addressed and give them a shock and a surprise.
- Talking about glad occasions, basic interests, exchanging cooking tips, sharing music etc.
- Maintaining a strategic and a decent distance from Tobacco, liquor and different unhealthy medications.
- Increasing our physical, emotional and mental susceptibility with the help of Yoga, Meditation, exercises and work outs.
- Not to judge and shun people who are ill, as they might be having an illness other than COVID-19 too.
- Telling people around you about the necessary precautions and home remedies which helps to boost immunity.

Older grown-ups, particularly in disengagement and those with intellectual decay/dementia, may turn out to be more on edge, irate, focused, upset and pulled back during the flare-up or while in isolate. Offer useful and enthusiastic help through casual systems (families) and wellbeing experts.

All these are encouraged to be done, for the welfare of humankind. As the whole world is trying to eradicate this virus, we as dutiful citizens can do our job by staying at home and being safe. In the event that we happen to get tainted with Corona, recollect a great many people show signs of improvement. Practice self-confinement and take prescriptions that are prompted.

Further details on minding our minds during Covid-19 can be accessed from  
<https://www.mohfw.gov.in/pdf/MindingourmindsduringCoronaeditedat.pdf>

#### ***4. How can technology help in tackling Covid-19?***

The turn of events and usage of innovation arrangements planned for battling the COVID-19 flare-up are quickly coming to fruition around the globe. Governments, Venture Capitalists, Academic Institutions, Incubators, Startups, and organizations huge and little are altogether doing their part to send new creative arrangements as fast as could be expected under the circumstances. The United States has ordered the Emergency Use Authorization (EUA), permitting the Food and Drug Administration (FDA) to assist the utilization of new clinical gadgets during general well-being crises. This is presently empowering organizations to send clinical gadgets to advertise at a fast and genuinely necessary pace.

Abbott Laboratories as of late built up a versatile 5-minute COVID-19 test unit the size of a toaster oven. The test pack, which got Emergency Use Authorization (EUA), is currently being utilized over the U.S. also, creation will slope to 50,000 tests per day constantly seven day stretch of April. This pivotal advancement will help away from tremendous excess of untested patients and specialists, allowing wellbeing authorities to at long last stretch out beyond the infection [25].

India's top Venture Capitalists, which incorporate Sequoia Capital, Accel, Matrix Partners, Kalaari Capital and others, alongside unmistakable heavenly attendant financial specialists are setting up an INR 100 crores reserve to help new companies creating items and administrations planned for containing the infection. This is an inviting sign for the startup network as their business environment has been gravely influenced by the flare-up: from upset flexibly binds to absence of financing.

There are millions of us who aren't a part of the health care workers or scientists at the health labs, who can have a feeling that we haven't been a part of the contribution in this fight. But nevertheless, we all have been playing our roles as dutiful citizens by staying at home and being safe. But also, we can do a bit more than staying at home. Guess what, technology gives us our answer. With the help of internet, social media, etc everybody is open to a big number of projects, which can actually be done from home.

A whole lot of these initiatives are powered by data and demonstrate us how to use crowd sourcing, data crunching, cloud computing which can improve our chances of getting this disease beaten. The crowd source data is a trend now, and is highly essential for medical technology and pharmaceutical companies-to collect data to create vaccines and its cure by conventional R & D.

The knowledge of data science, can help us find lots of things that can be done over at Kaggle, Google's crowd sourced data science portal.

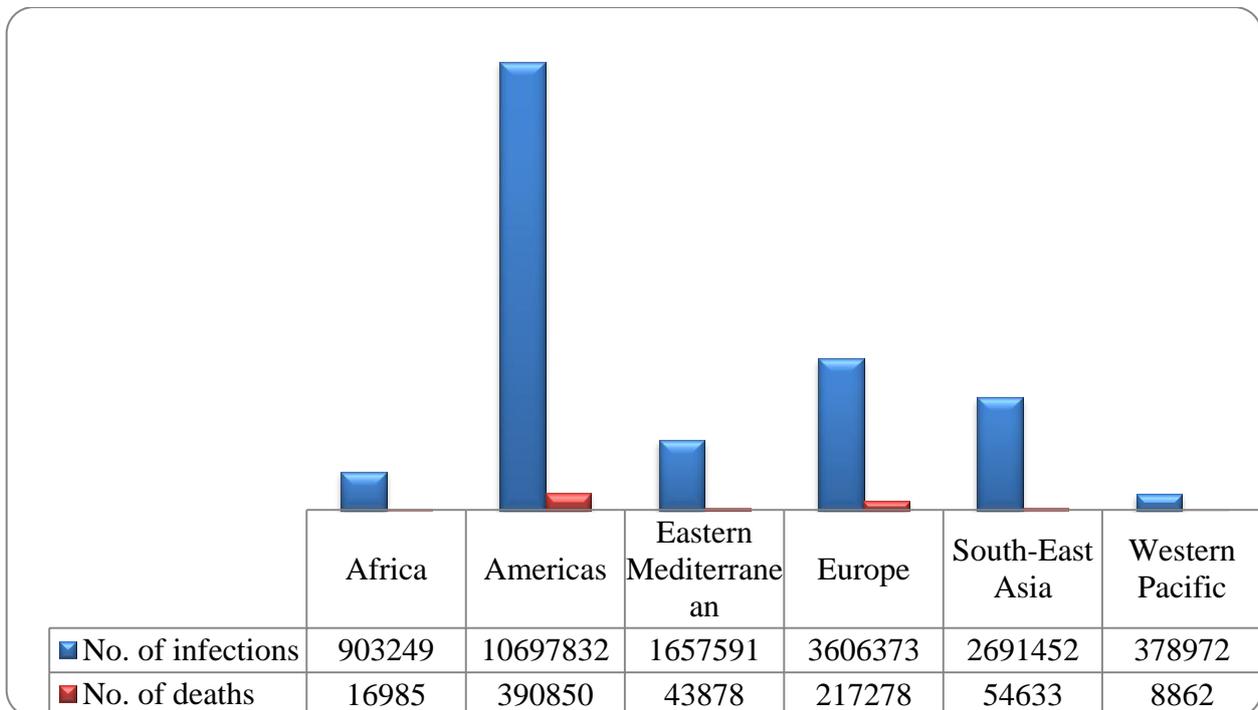
Folding @ Home is a long running crowd sourced project which can be used to tackle other medical data problems. Like there, we have so many great projects and initiatives which can be possible during a pandemic. Once we get this pandemic under control, our next goal and challenge will prop the pace up to grow new arrangements which can ideally stop future pandemics happening all through the world [26].

Information and communication technologies (ICTs) and different advances are progressively being utilized to help endeavors to battle and contain the spread of the worldwide COVID-19 pandemic. Three key regions where inventive innovation is helping during this remarkable emergency are breathing gear, contact following and patient consideration. Continuous advances in modern technology have contributed to the improvement of people's lives and thus there is a strong conviction that validated research plans including artificial intelligence will be of significant advantage in helping people fight this infection.

The total number of infections, deaths and recoveries cross worldwide are depicted in Table 1 and Fig. 1 (data as on 11<sup>th</sup> August 2020) [27].

**Table 1:** Total number of COVID 19 infections, deaths and recoveries

Infections	Deaths
1,99,36,210	7,32,499



**Fig. 1:** No. of infections and deaths continent wise [Data as on 11<sup>th</sup> August 2020]

#### 4. Conclusion

The Corona virus pandemic has become a dangerous nightmare for the ecosystem, which needs immediate therapeutic interventions and safety control measures. All concerned, especially the decision makers must be

regularly updated of the updates from local and global healthcare authorities, so as to follow all required guidelines and action plans. The article highlights the salient aspects of the virus SARS-COV-2, symptoms and infections, treatments protocols, technological applications, health management, medication regimen etc. Till such a time an effective drug or vaccine is made available, practicing safety norms and maintaining social distancing appears as the best strategy to forge ahead amidst the crisis.

***Declaration of competing interest***

None

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