

## COVID Awareness Issue

### **Short Note on Previous Struggles with COVID 19, Challenges and Precautions.**

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The COVID-19 disease started small, assuming a monstrous proportion in the last twelve months; camouflaging and changing faces, full of surprises. There are various causes for its fast spread, but mainly two determinant reasons: the lack of immunity and proper treatment, and the highly contagious nature of this new infection. Both factors are due to a lack of proper evidence-based knowledge, the COVID-19 virus being new to the world at its start.

The disease is very variable and has a wide spectrum of symptoms that present itself as mostly absent, (almost 80% of cases being asymptomatic). When symptomatic cases are exhibited, upper respiratory tract illness with fever and cough are commonly noticed. Surprisingly, the classic expected respiratory triad is found in less than 15% of cases, (consisting of cough, fever, and dyspnea). Mortality rates range from 1-21% in different geographic regions. The main dreaded complication displays itself commonly as an advanced pulmonary complication, comprising of pneumonia, and finally complicating to acute respiratory distress syndrome [ARDS], with the fulminant course. The disease shows a high predilection for the elderly, those who are immunocompromised, and those with chronic diseases. Crowded conditions further facilitate its contagious behaviour.

## **Background-General Information**

Originating in late-2019, in China, the disease spread to the whole of humanity, even detected in some animals. The W.H.O declared it a pandemic on the 11th of March, 2020, storming us while the world was asleep.

By the latest figures, the confirmed number of global cases is much over 8.1 million, with more than 1.88 million deaths. In early-March, 2020, cases outside China began exponentially increasing, prominent early location of this growth were nations in Europe, Asia, and the Americas [the Johns Hopkins Coronavirus Resource Center website for specifics at a given time <<https://coronavirus.jhu.edu/>>].

One of the predominant scientific reasons for variable morbidity is the modified spike protein S, shown in strains across countries with higher transmission rates. Photodynamic mutation explains the variation in strain presentations. Therefore, Scientists and researchers are on high alert, aiming to identify newer mutated strains to find an early solution. The latest newly mutated strains, identified in some countries, have surpassed the relative “younger population sparing effect”, causing renewed concern.

## **Challenges posed by novel COVID-19 infection to humanity**

Besides its morbidity and mortality, the CDC (since early April 2020), recommends travelers to avoid non-mandatory international travel to control the spread of infection. Restricting domestic travel, and staying at home as much as possible has curbed the wildfire-like spread of this potentially deadly infection to some extent.

However, there were major implications on the financial front, physical, mental, and social spheres. It had a paralyzing impact on the hospitality and travel industry, and an overwhelmed, burnout effect on the health field. Importantly, the quarantine on both abroad and return affected executive job produce remarkably, (based on origin and destination of travel).

## **The Transmission Potential and Epidemiology explains the restrictions imposed by Official bodies.**

Transmission occurs with extreme efficiency, high-density living facilities such as malls, nursing homes, homeless encampments, jails and prisons are affected greatly; Workspaces of crowding like meat-packing plants/factory workers/places of public gatherings are affected majorly. Even the simple tasks of talking or singing in close quarters may efficiently spread the virus, (as shown by a study done on a

choir group in the state of Washington. 52 of 61 choir members became ill in March 2020).

Early cases in the Presymptomatic stage are the reason for most of the transmission. The principal mode of transmission is likely to be respiratory droplets, which can be propelled up to 6 feet by sneezing or coughing. Evidence supports the spread via fomites too, (variable duration of viability on different material objects still being researched).

The incubation period for SARS-CoV-2 ranges from 2-24 days, holding an average of about 5.2 days. Hospital-related transmission to staff or other patients was reported in 41% of 138 hospitalized patients from Wuhan, China, in the early phase study. A preliminary study from Birmingham, England showed that among hospital personnel, the significant transmission of the disease was found amongst housekeeping staff and physicians on acute medicine and general medicine services. The symptomatic disease appears to develop in men more often than in women. Often, adults have more severe disease while children show lower concentrations of ACE-2 receptors in the lung tissue (which may explain their lower propensity toward infection).

## **Health Concerns of the Public**

Amongst various factors that are complicating the control of this virus are this triad:

1. The known infectivity of health care workers.
2. The spread by infected individuals in the early asymptomatic phase of illness
3. The difficulty accessing testing, (where virus-hosts keep perpetually multiplying).

## **Tests availability in Various Combinations**

There are various versions of nucleic acid testing that are currently offered across the globe. Provisioned testing is usually done through local and state health departments and many hospital-associated clinical laboratories.

## **Initial Phase limited availability of Essential Supplies helped the spread**

The use of personal protective equipment has been made mandatory for health care workers who contact suspect cases, and those exposed to secretions (such as anesthesiologists and pulmonologists). The problem of an adequate supply of these was a major constrain in many regions in the world. Face coverings, necessarily surgical masks, are the uniformly accepted recommendation while in public or potentially infective spaces. Masks are a must among the general population, especially in public interactions, and required in our jurisdictions too - (some nations having personal choices to its use.).

## **Many developed countries faced limitations during the initial phase of COVID-19.**

There was a scarcity of urgently needed supplies preventing the spread, including:

1. The availability of masks, personal protection equipment and ventilators. (Critical-care beds, and the doctor/nurses teams.)
2. Widespread implementation of containment measures (social distancing and self-quarantining) before the disease spread exponentially in vulnerable populations.
3. Standardization of nucleic acid assays and the implemented broad surveillance that helped control infection.
4. Expansive accessibility of serologic tests and public information on the community impact of COVID-19, (efficient establishment of contact tracing strategy).
5. Determining where social distancing measures need to be lifted or reinforced.
6. Identifying recovered patients who could provide convalescent serum.
7. Standardization of data reporting.
8. Vaccine development and research, and the severe lack of time available for evidence-based treatment, including futuristic adoptive and flexible transparent vision for protection.
9. The State's ability to test and treat all those who have symptoms.
10. A robust system of contact tracing.

## **Understanding Symptomatology was a Lesson Learned**

You cannot use a single symptom as a sine qua non for the disease. Symptomatic patients may have a cough, fever, chills/rigours, or myalgias. Dyspnea is present in variable numbers and is especially infrequent in children.

Less frequent symptoms may be rhinitis; pharyngitis; abdominal symptoms ( including nausea and diarrhoea); headaches; anosmia; and ageusia. Roughly 15–20% of people with COVID-19 may require hospitalization, and 3–5% require critical care. Infection is particularly serious in the elderly and those with immunocompromising conditions, for example, those with a post-organ transplant; chronic diseases like diabetes, hypertension, and chronic heart, lung, or kidney disease; and prior stroke. The infection shows a predilection for lung tissue. Still, data regarding the susceptibility of persons who smoke cigarettes, and those with asthma are unclear. Pregnant women do not appear to be at an increased risk for complications (like they do with the influenza infection).

## **Laboratory indices of Value**

- Haematology findings: neutrophilia, absolute lymphocytosis (using 400 cells/mcL as a cutoff).
- Biochemistry values: increased lactate dehydrogenase level, and increased liver enzymes.

Coagulopathy was seen in severe COVID-19 initially, identified by elevated D-dimer and fibrin/fibrinogen degradation products, the prothrombin time, and partial thromboplastin time. Platelet counts are usually unaffected initially, (unlike DIC).

## **Diagnosing the infection: No standardization of Techniques**

The COVID-19 diagnosis was established using nucleic acid testing, besides the FDA approved the SARS-CoV-2 PCR test. There is a myriad of SARS-CoV-2 antigen tests, but the standardization of these tests is far from the conclusion. The sensitivity of nucleic acid tests from oral swabs is low (35%); nasopharyngeal swabs (63%); or the more invasive Bronchoalveolar lavage fluids (91%). Sputum is preferred over oropharyngeal specimens, as the virus may be detectable longer in sputum than in other upper respiratory tract samples.

Hindrances that were discovered globally in diagnostics:

1. In major lacunae, no assay is 100% specific and needs remembering. The test may become positive after being initially negative during infection; the duration of IgM and IgG antibodies to SARS-CoV-2 persists after recovery from infection, remaining unclear.
2. Still undergoing evaluation, CRISPR-Cas12 lateral flow real-time polymerase chain reaction (RT-PCR) assay uses respiratory specimens that are reported to be 100% sensitive and 95% specific.
3. The role of imaging and its limited application during the early disease: neither chest radiographs nor chest CT scans provide diagnostic utility, since both may be normal, only later in the disease course, nonspecific diffuse ground-glass opacities and/or multilobular infiltrates progressing to consolidation.

The mechanism and indicators of infected patients for complications:

In the majority of the population, the disease has a benign course. Only 5- 6% of cases have a critical illness requiring intensive care and support. There are predictors of complicated courses in the form of biochemical and lab values, and deteriorating vitals. Severe COVID-19 diseases have been postulated due to the development of an intense and/or prolonged inflammatory reaction also called a “cytokine storm,” in the later phase of the illness.

A large Chinese study reported dependent predictors of fatal outcomes: those aged 75yrs and older; a history of coronary heart disease, cerebrovascular disease, dyspnea, procalcitonin levels over 0.5 ng/mL; and aspartate aminotransferase levels over 40 units/L. A small percentage of critically ill patients may have multi-organ failure, which is present with pulmonary/cardiac/renal/brain severe deterioration and coagulopathy, and finally, succumb to the illness. The serious psychological sequelae of potentially dying alone cannot be discounted. Limited funeral services are all relevant issues with which society is

grappling. These important aspects require unique, tolerable, safe, and acceptable solutions

## **General Effective Precautions in the COVID-19 infection.**

Although prevention recommendations are evolving, the usual advice includes handwashing with soap and water for at least 20 seconds, avoiding touching the face, and wearing a mask for face-covering in public.

For healthcare workers, wearing an impermeable mask [like the N95 mask] (if exposure to patients with a cough is anticipated), and isolating cases so that infected patients do not continue the chain of infection is recommended.

Social distancing is an important practical tool for controlling the spread of the disease.

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