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# Covid-19 - A Pandemic on the Lam! Where Bangladesh Stands

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***Abstract***

*The COVID-19 pandemic, caused by the novel coronavirus SARS-CoV-2, has emerged as one of the most significant global health crises in modern history. This review examines the virological, immunological, and clinical characteristics of the disease and evaluates the response measures undertaken globally and in Bangladesh. Emphasis is placed on the challenges faced by lower-middle-income countries like Bangladesh, including population density, resource limitations, and sociocultural constraints. The article underscores the critical need for increased testing capacity, public health infrastructure, and international collaboration. Drawing from scientific literature and public health insights, it calls for strategic interventions, community engagement, and equitable support mechanisms to navigate and recover from the pandemic's widespread disruption.*

**Keywords:** COVID-19, SARS-CoV-2, Bangladesh, Pandemic Response, Public Health, Virology, Healthcare Infrastructure, Social Distancing, Viral Transmission, Developing Countries

## Introduction

Today the term "pandemic" is both a metaphor for a global process and a specific instance of that process. The process in question is a distorted form of development, whose expression in neoliberalism has produced in "pandemic" fashion colossal but highly concentrated wealth, enormous inequality and vast environmental destruction, with profound implications for the construction of risk to natural and anthropogenic hazards globally [1]. The specific instance is the COVID-19 pandemic, a global disaster the scale of which transcends ecological regions, national borders, economies, and societies, overwhelming their specific capacities to address disruption of societal functions. Parallel to other pandemics, the outbreak of corona virus is expected to bring catastrophe to the human civilization as an uncharted arena.

COVID-19 is a novel form of corona virus which has spread from its initial identification in Wuhan, China, and has been declared a pandemic by the World Health Organization (WHO) [2]. Corona viruses are a large family of viruses that cause illnesses ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERSCoV) and Severe Acute Respiratory Syndrome (SARS-CoV). Corona viruses are zoonotic, meaning they are transmitted between animals and people. Several known corona viruses are circulating in animals that have not yet infected humans but it appears that COVID-19 has crossed species from bats to snakes, and pangolins then to humans, initially via the live animal 'wet markets' of Wuhan [3-5]. In December 2019, novel Coronavirus-2019 has emerged in the Huanan Seafood Market, where livestock animals were also traded, in Wuhan State of Hubei Province in China and has been the sheer global attention due to clusters of pneumonia cases with unknown cause [6]. The virus was named as 2019-nCoV by WHO on January 12 for an interim period and the disease as COVID-19 on 11 February2020.

The viral agent (SARS-Cov-2) of COVID-19belongs to the genus Corona virus in Corona viridae family and are pleomorphic enveloped with a positive sense single-stranded RNA genome (26–32 kilobases), 80–160 nm in size characterized by crown-shape peplomers emanating from the surface [7]. Adaptation to cells of different host species readily occurs since corona viruses possess error-prone RNA-dependent RNA polymerases, fostering mutation and frequent recombination events. Along with its

high mutation rate, corona viruses are present in diverse species of animals, e.g., bats, camels etc, infecting humans with the manifestation of a wide range of clinical features from mild illness to fatal respiratory issues causing imminent threat of hospitalization [8]. Additionally, researchers emphasized that spike protein of the virus is 10 to 20 times more efficient in binding with hACE2 compared to the SARS-like virus from 2002; hence the COVID-19 appeared more contagious than the earlier SARS- like viruses [9].

The virus damages the function of CD4+ T cells accelerating activation and possibly subsequent exhaustion of CD8+ T cells; together, this may eventually wane host antiviral immunity [10]. Similar to other SARS-CoV, the infection shows elevated levels of IL-6, IFN-α, and CCL5, CXCL8, CXCL-10 in serum. The cytokine storm will trigger a violent attack by the immune system to the body, cause ARDS and multiple organ failure, and eventually lead to death in severe cases of SARS-CoV-2 infection [11]. The diagnosis of COVID-19 is based on a history of detailed contact, travel, and precise laboratory testing. The laboratory modalities used to diagnose are molecular methods, immunological tests and viral culture. The suspected cases should be screened for the virus with nucleic acid amplification tests (NAAT), such as RT-PCR. The rRT-PCR is performed using viral RNA from respiratory samples; for instance, oropharyngeal swabs, sputum, nasopharyngeal and tracheal aspirates and bronchoalveolar lavage. In particular, lower respiratory tract samples can offer significantly higher viral load and genome fraction than upper respiratory tract samples.12On chest radiography or thorax CT imaging of the examined patients, unilateral or bilateral lung involvement compatible with viral pneumonia was evident and bilateral multiple lobular and sub- segmental consolidation areas were observed in patients admitted in the intensive care unit [12].

There are as yet no antiviral drugs approved for the disease, and hence, non-therapeutic interventions to control the spread of the virus are the most effective measures to control the disease. There is however a thin line of hope as there are drugs like favipiravir, Molnupiravir that blocks RNA-dependent RNA polymerase and remdesivir, a 'nucleotide analogue' drug that has shown some promise in the treatment. Moreover, the generation of recombinant human monoclonal antibody (mAb) [tocilizumab (anti IL-6 receptor), bevacizumab (anti VEGF-A)] is a fairly straightforward path to neutralize SARS- CoV. The mAb is assumed to bind potently with the receptor-binding domain (RBD) of SARS-CoV-2 and has the potential to be developed as candidate therapeutics of SARS-CoV-2infections [13].

Bangladesh, a lower-middle-income country and one of the world's most densely populated areas, is struggling to combat the spread of the disease. As we are dealing with an obscure malady, the focus should be given on containing it by strengthening widespread surveillance, conducting thorough investigations to identify contacts and applying appropriate measures to prevent further spread. Among the preventive measures for COVID-19, including aggressive tracing of cases and contacts, strict quarantine, and screening, as well as education to promote good hand hygiene practices, should be put in place. At the same time, there is also a pressing need to gain detailed insights into disease biomics, including genomic architect and cell biology of natural (animal) and accidental (human) hosts and environmental factors influencing the viral adaptation for favoring replication.

As mentioned earlier, Bangladesh did not impose any strict protocol initially, and millions of people were out on the streets, especially in Dhaka. It appears that social distancing is tough while taking public commutes and living in the slums. In the context of massively populated and lower-middle-income countries like Bangladesh, enforcement of social distancing—as recommended by the WHO to stop the nCoV-2 spread—sounds fancy but impractical. Indeed, staying at home is unlikely to be as effective here. Along with the slum dwellers, Bangladesh also hosts over a million Rohingya refugees, most of whom are living in close quarters in refugee camps where the sanitization facilities are even scarce. Fear of COVID-19 is already gearing up among the displaced people in these camps. Immediate enforcement of social distancing is, in every way, practically impossible in a country like Bangladesh.

Bangladesh is perhaps among the worst-ranked countries for nCoV-2 testing rate, though the mortality rate is comparatively higher. The centralization of COVID-19 diagnosis facilities is somewhat plausible, as most hospitals do not have enough personal protective equipment (PPE). As a result of the combined lack of PPE and diagnostic testing capacity, fear, and anxiety geared up among the mass population, and many healthcare workers refused to provide any service. The health system of Bangladesh depends on around 100 thousand registered doctors, and if these very few doctors compared to the population size are unable to provide their healthcare service as a result of the unavailability of PPE, this could have potentially catastrophic consequences.

Fear and anxiety about the pandemic are causing overwhelming stress for everyone. While receiving mixed messages piles up the stress, sharing the real facts and understanding the actual risk reduces the stress. Moreover, this helps the authorities to organize better and manage the crisis. Social activists, television and print media, social workers, and religious and political leaders should come forward to help in the dissemination of scientifically factual information on nCoV-2 and COVID-19 among the mass population of Bangladesh. For instance, the Imams (a Muslim leadership position) of each mosque could play a vital role in fighting this extraordinary crisis in Bangladesh. Together, the media personalities and political and religious leaders could help spread basic knowledge on COVID-19- related issues to the mass populace, especially the marginalized communities.

Above all, Bangladesh must source a decent emergency support fund to help its workers, employers, parents, marginal people, and hosted refugees. The country may temporally postpone all non-essential developmental works and gather a modest amount of money to support its people in fighting this crisis. Also, top business organizations and international funders should come forward to help Bangladesh fight the COVID-19 challenge. Only a supportive and empathic collaborative effort can help the world, especially the low and lower-middle-income countries like Bangladesh, overcome this crisis.

Preparedness is the key to addressing any health crisis, and so far, Bangladesh, as a lower-middle-income country, has numer-

ous limitations in restricting the spread of the virus. While continuing the lockdown at any cost with more strict maintenance, the country has to expand its testing and healthcare facilities. It has to ensure a constant supply of PPE for healthcare workers. Above all, improvised and timely measures taken with proper coordination may help the country to fight the lethal virus. The Government will not be able to mitigate the situation alone individual efforts from the citizens, direct involvement of the nation's public health experts, and international help are urgently needed. As the situation intensifies, the world is closely watching how Bangladesh will navigate this crisis [14].

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