



Management of COVID-19 Crisis: Bangladesh Perspectives

Suvmoy Datta ^{1,2*} Maruf Abony ¹, Priyanka Dutta ³

Abstract

Bangladesh boasts one of the world's most extensive networks of community health workers and a robust tradition of public-private collaboration during crises, underpinned by resilient communities. These strengths underscore Bangladesh's capacity to navigate the current crisis effectively, finding optimal solutions to ensure survival amidst the catastrophe of COVID-19. Globally, the COVID-19 pandemic has ravaged lives and caused widespread societal disruption, prompting closures of schools and workplaces aimed at curbing transmission and delaying the peak of the epidemic. Bangladesh's strategy to combat COVID-19 cannot rely solely on governmental efforts; it necessitates unprecedented collaboration across public and private sectors, both locally and internationally. Initiatives such as the COVID-19 Action Platform by the World Economic Forum, in conjunction with the World Health Organization, have been pivotal in responding to the pandemic. Bangladesh can leverage these platforms to bolster its private sector, share its experiences in managing COVID-19, and enhance economic resilience. Data from the Institute of Epidemiology, Disease Control, and Research highlight that the majority (62%) of COVID-19 cases in Bangladesh have occurred among individuals aged 21-50. Notably,

those aged 31-40 account for the largest segment (23%) of infections, followed by those aged 21-30 (20%), and 41-50 (19%). Patients aged 51-60 constitute 15% of cases, while those over 60 represent 13%. Adolescents (ages 11-20) and children (under 10) comprise 7% and 3% of cases, respectively. This demographic profile aligns with trends observed in neighboring India but differs from harder-hit countries like the USA, China, and Spain.

Keywords: Bangladesh, COVID-19, Community health workers, Pandemic response, Public-private cooperation.

Introduction

The outbreak of Coronavirus Disease 2019 (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has emerged as a pivotal global health crisis. The disease was first identified in December 2019 in Wuhan, the capital city of Hubei province in China, and rapidly escalated into a worldwide pandemic that has drastically affected nations across the globe (World Health Organization [WHO], 2020a). By April 22, 2020, over 2.6 million cases had been confirmed in more than 200 countries and territories, leading to approximately 183,000 deaths, a number that continues to rise (Hui et al., 2020). COVID-19's symptoms range from mild to severe, with common manifestations including fever, cough, and shortness of breath, while more severe cases can lead to viral pneumonia and multi-organ failure (WHO, 2020b; Centers for Disease Control and Prevention [CDC], 2020a). The rapid spread of COVID-19 underscores the interconnectedness of modern societies, where local outbreaks can have global repercussions. This pandemic has highlighted the fragility of our global systems and the pressing need for a cooperative approach to

Significance | The significance of Bangladesh's response to COVID-19 lies in its robust community health networks, public-private partnerships, resilience, and adaptive strategies for crisis management and economic recovery.

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global challenges. Issues such as climate change, biodiversity loss, and financial instability share a common thread with pandemics like COVID-19; it does not respect national or geographical boundaries and demand a unified global response (Hopkins, 2020). The emergence of COVID-19 serves as a stark reminder of the consequences of human activities that push the planet to its limits. Deforestation and biodiversity loss, for instance, have been linked to increased chances of zoonotic viruses like SARS-CoV-2 crossing species barriers, a risk further exacerbated by climate change (WHO, 2020c).

The link between environmental degradation and the increased likelihood of pandemics is becoming increasingly evident. Deforestation, for example, brings wildlife into closer contact with human populations, elevating the risk of zoonotic spillover events. The Intergovernmental Panel on Climate Change (IPCC) has warned that global warming could accelerate the emergence of new viruses by altering habitats and ecosystems, which in turn affects the dynamics of disease transmission (Worldometer, 2020). As such, the current pandemic can be viewed as a consequence of unsustainable practices and a precursor to potential future crises if global environmental policies are not urgently addressed.

At the molecular level, the SARS-CoV-2 virus is characterized by its relatively simple structure: a single-stranded RNA genome approximately 30,000 bases long with just 15 genes (Wei et al., 2020). In comparison, the human genome is composed of a complex double-helix DNA structure with about 3 billion bases and approximately 30,000 genes (Chen et al., 2020). Despite its simplicity, the virus has had a profound impact on global health, illustrating the potent effects of viral pathogens on human populations.

The availability of the SARS-CoV-2 genome sequences from around the world, with over 818 full genome entries documented in the National Center for Biotechnology Information (NCBI) database, has been instrumental in understanding the virus's spread and evolution (Chen et al., 2020). Whole genome sequencing allows researchers to track the genetic changes in the virus as it transmits through populations, providing critical insights into its transmission dynamics and aiding in the development of public health strategies to combat the pandemic.

Recognizing the severity of the situation, the World Health Organization (WHO) declared COVID-19 a Public Health Emergency of International Concern (PHEIC) on January 30, 2020 (WHO, 2020d). This declaration underscored the urgent need for a coordinated global response to mitigate the virus's impact. The COVID-19 pandemic has not only challenged global health systems but has also served as a crucial lesson in the importance of global solidarity and the need to address environmental issues to prevent future pandemics.

Symptoms and risk groups of COVID-19

Infected people may be asymptomatic or develop flu-like symptoms such as fever, cough, lethargy, and shortness of breath (Wei et al., 2020). Emergency signs include trouble breathing, persistent chest discomfort or pressure, disorientation, difficulty awakening, and blue face or lips; if these symptoms are present, seek emergency medical assistance (Chen et al., 2020). Upper respiratory symptoms such as sneezing, runny nose, or sore throat are less prevalent. Nausea, vomiting, and diarrhea have all been reported in varied degrees (Elsevier, 2020). Based on existing data and clinical experience, older persons and people of any age with major underlying medical disorders may be at a greater risk of severe disease from COVID-19. People of all ages with underlying medical conditions, particularly if they are not well controlled, including people with chronic lung disease or moderate to severe asthma, people with serious heart conditions, people who are immunocompromised (including cancer treatment, smoking, bone marrow or organ transplants, immune deficiencies, and prolonged use of corticosteroids), people with diabetes, people with chronic kidney disease kidney disease undergoing dialysis, and people with liver disease. Some instances in China began with merely chest discomfort and palpitations. According to research from March 2020, loss of smell (anosmia) may be a prevalent symptom among persons with moderate condition (Iacobucci, 2020).

Diagnosis

The WHO has published several testing protocols for the disease. The standard method of testing is real-time reverse transcription polymerase chain reaction (RT-PCR) (World Health Organization, 2020a; Centers for Disease Control and Prevention [CDC], 2020a). The test is typically done on respiratory samples obtained by a nasopharyngeal swab, however, a nasal swab or sputum sample may also be used. Results are generally available within a few hours to two days (CDC, 2020b; Vienna BioCenter, 2020; Brueck, 2020). Blood tests are an option, but they need two blood samples taken two weeks apart, and the results are not immediately useful (World Health Organization, 2020b). Chinese researchers were able to isolate a strain of the coronavirus and disclose its genetic sequence, allowing laboratories all over the globe to independently develop polymerase chain reaction (PCR) tests (Cohen & Normile, 2020; Moniruzzaman et al., 2020). There were no antibody tests available as of March 19, 2020, however efforts to create such tests were continuing. On March 21, 2020, the FDA authorized the first point-of-care test for use at the end of that month (Vogel, 2020; Pang et al., 2020; U.S. Food and Drug Administration, 2020). A March 2020 assessment indicated that early-stage chest X-rays are of limited utility, but CT scans of the chest are beneficial even before symptoms appear. Bilateral multilobar ground-glass opacities with a peripheral, asymmetric, and posterior distribution are common

on CT. As the illness progresses, subpleural dominance, crazy paving, and consolidation emerge, and the American College of Radiology recommends that "CT should not be utilized to screen for or as a first-line diagnostic to diagnose COVID-19" as of March 2020 (Zhou et al., 2020; American College of Radiology, 2020).

Prevention and treatment

Rapid information dissemination is a primary objective for COVID-19 disease control and prevention. In China, a daily press release mechanism has been devised to enable the effective and efficient dissemination of pandemic information, including frequent hand-washing, cough etiquette, and the use of personal protective equipment (such as masks) when entering public areas. Preventive strategies include staying at home, avoiding crowded locations, washing hands with soap and water often and for at least 20 seconds, practicing excellent respiratory hygiene, and avoiding touching the eyes, nose, or mouth with unclean hands (Centers for Disease Control and Prevention [CDC], 2020; World Health Organization [WHO], 2020a; HeadTopics, 2020). Furthermore, do not take any type of chloroquine unless recommended by your family doctor and obtained from a legal source. Seek quick medical attention if you are experiencing difficulty breathing. The discovery of the method through which SARS-CoV-2 enters cells is a potentially intriguing endocrine-related finding. Angiotensin-converting enzyme 2 (ACE2) has recently been identified as the SARS-CoV receptor (Yan et al., 2020).

Bangladesh perspectives

The 2019-20 coronavirus pandemic was found to have spread to Bangladesh in March 2020. The country's Institute of Epidemiology, Disease Control, and Research (IEDCR) announced the first three known cases on March 7, 2020 (Institute of Epidemiology, Disease Control and Research, 2020) [31]. As of April 22, 2020, the Government of Bangladesh had recorded a total of 3772 confirmed cases and 120 fatalities in the nation (Institute of Epidemiology, Disease Control and Research, 2020) [32]. The low number of positive cases and fatalities was ascribed to inadequate testing in contrast to neighboring nations (Dhaka Tribune, 2020) [33]. Experts criticized the country's population of more than 160 million for not conducting enough tests as shown in Table 1. However, 17 laboratories have lately been certified for testing purposes in various places around the nation (New Age Bangladesh, 2020a; New Age Bangladesh, 2020b; Yahoo News, 2020).

The biggest number of positive cases (more than 300 new cases per day) was discovered on April 20-22. As time passes, there appears to be an expanding trend of new instances. The first COVID-19 death case was confirmed on March 12th and, to date, the COVID-19 death rate (4.0%) in Bangladesh has been lower than the global average mortality rate (6.4%) (World Health Organization, 2020a).

When it comes to COVID-19 infections, age does not always matter. When the elderly are at the greatest danger of death, all age groups are equally vulnerable to infections. Different persons are at a higher risk of developing severe symptoms that necessitate hospitalization or intensive care, and the odds of dying from COVID-19 varies greatly between age groups as shown in Table 1 and 2. However, when it comes to gender, males are more likely to become infected, with 68% of overall cases being male and 32% being female, according to statistics obtained on positive cases (New Age Bangladesh, 2020c). According to government figures, the infection rate from COVID-19 in Bangladesh is lower than in other nations impacted by this epidemic; specialists believe that this is because many patients are remaining undiscovered (New Age Bangladesh, 2020c). To limit the danger of cross-infection, Bangladesh should conduct quick screening or diagnosis of COVID-19 patients. First and foremost, the pre-examination and triage procedure has been reinforced. Attending physicians or those with extensive knowledge in infectious illnesses are primarily in charge of screening patients and assuring the correctness of various triages. Second, following triage, patients will be assigned to either the general clinic or the fever clinic based on their epidemiological history and clinical features. In reality, the fever clinic should be separated into three sections: COVID-19 screening, common fever screening, and pediatric non-COVID-19 with fever screening. These three regions should be kept carefully segregated to prevent cross-infection among patients. Third, a consultation team comprised of doctors from the infectious disease, respiratory, and imaging departments should be assembled to provide rapid consultation and screening of suspected COVID-19 patients. Last but not least, healthcare professionals must practice self-protection, and the distribution of personal protective equipment must be maximized. Genome sequencing will offer the highest resolution information feasible, which has the potential to change COVID-19 management. By analyzing changes in the genetic code of viruses from various patients, researchers will be able to trace the virus's transmission in real-time, tracking new mutations to see whether distinct strains are forming (Vienna BioCenter, 2020).

A better knowledge of the virus's genetic makeup might eventually save lives by directing public health and clinical care initiatives, as well as helping the development of medicines and vaccinations to battle the virus. It will also help researchers better understand how treatment and vaccination efficacy may alter as the virus develops. Continuous monitoring of the virus will alert researchers to genetic alterations that may result in less or more virulent variants. Early detection of a more virulent virus or the onset of treatment resistance will be critical for supporting disease prevention efforts and developing new medicines and vaccines (Centers for Disease Control and Prevention, 2020; Vienna BioCenter, 2020). Bangladesh declared a one-month statewide lockdown on March

Table 1. Covid-19 status in Bangladesh.

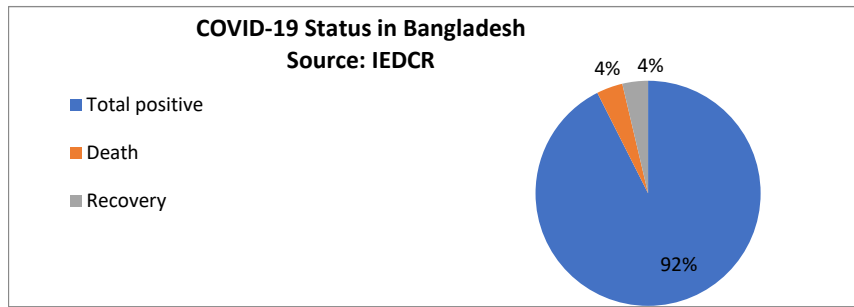


Table 2. Age distribution of Covid-19 patients in Bangladesh.

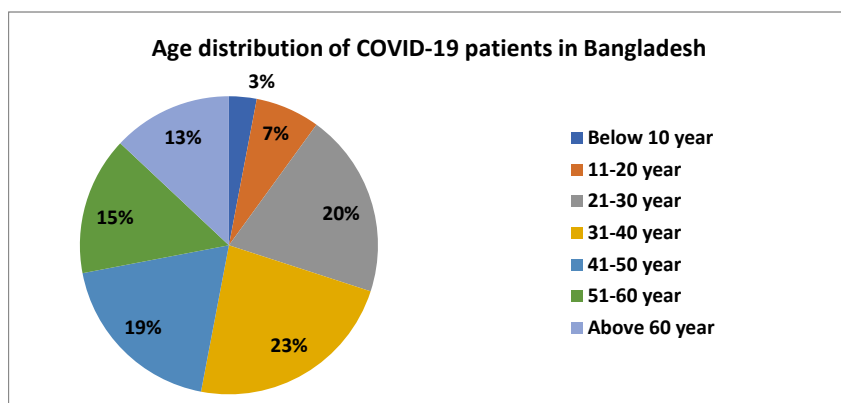


Table 3. Gender distribution of COVID-19 patients in Bangladesh.

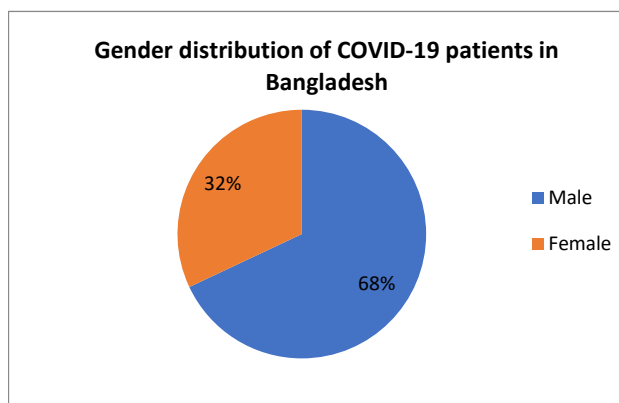


Figure 1. Typical CT imaging findings.

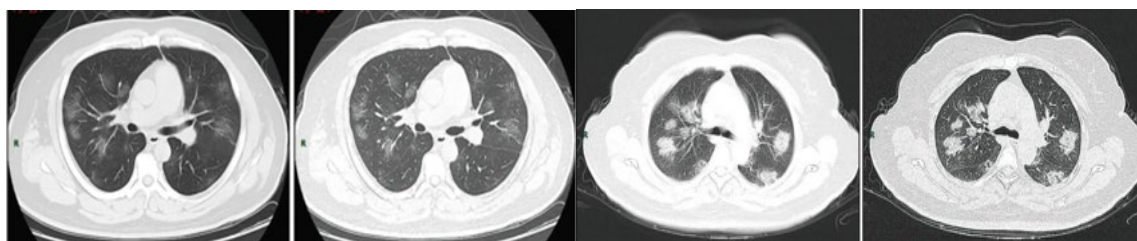


Figure 2. CT imaging of rapid progression stage.

26, 2020, to combat the spread of the new coronavirus following four deaths and at least 39 illnesses. To combat the spread of the COVID-19 virus, authorities have issued a ban on passenger travel by water, rail, and domestic airlines beginning March 24, and all public transportation on roads beginning March 26. Low-income employees in the capital Dhaka, on the other hand, have been leaving the city via various methods due to the increased danger of COVID-19 infection as a result of the ban on trains and other public transportation services. Hundreds of such commuters were spotted leaving the city on the night of March 25, 2020, on the rooftops of public buses and trucks in Dhaka's business district of Motijheel, in defiance of official orders and posing a significant danger of COVID-19 transmission (Reuters, 2020; Institute of Epidemiology, Disease Control and Research, 2020; Dhaka Tribune, 2020).

Bangladesh must swiftly transition from industrial to regenerative agriculture in order to handle the aftereffects of the COVID-19 epidemic and to trap carbon in the soil at a rate adequate to reverse the climate calamity. Furthermore, doing so would generate revenue, promote economic and environmental resilience, create employment, and boost welfare in both rural and urban populations. Many of the new economic models being investigated by municipal governments throughout the world include regenerative agriculture, all of which are founded on the premise of living within our ecological bounds to guarantee that disadvantaged areas do not fall behind (World Health Organization, 2020; Worldometer, 2020; Chen et al., 2020).

Conclusion

Bangladesh's approach to managing the COVID-19 pandemic underscores the critical importance of its extensive network of community health workers, strong public-private partnerships, and the resilience of its population. These factors have been pivotal in navigating the complex challenges posed by the pandemic. However, the crisis also highlights the necessity of unprecedented collaboration across all sectors, both locally and globally, to enhance economic resilience and public health infrastructure. By leveraging platforms such as the World Economic Forum's COVID-19 Action Platform and partnerships with the World Health Organization, Bangladesh can strengthen its private sector, share valuable insights from its experiences, and bolster its overall pandemic response. As the pandemic continues to unfold, Bangladesh's adaptive strategies and commitment to collective action will be crucial in safeguarding public health, ensuring economic stability, and contributing to global efforts to mitigate the impact of future health crises.

Author contributions

S.D. conceptualized the project, developed the methodology, conducted formal analysis, and drafted the original writing. M.A. contributed to the methodology, conducted investigations,

provided resources, visualized the data. P.D. contributed to the reviewing and editing of the writing.

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Competing financial interests

The authors have no conflict of interest.

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