

# In Some Selected Districts of Bangladesh During the Covid-19 Pandemic Period, Sanitation and Health Service Facilities

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**Keywords—** Questioner Survey, Selected Location, Quarantine place.

**Abstract—** Our goal was to gain a sense of sanitation and health-care infrastructure in a few Bangladeshi regions during the Corona period. Performing our duties during the Corona era was difficult. During the lockdown, we had to get the job done despite the people's opposition. We went to everyone's residence and assessed the sanitary system, but since they were afraid of Corona, many of them did not completely reveal their concerns. As a result, we had to deal with a slew of issues. Many people have avoided eating out as a result of the Corona problem. They're sipping water that's boiled. During the corona time, we learnt about the reaction to human health awareness through the internet. Sanitation's overarching goals are to offer a healthy living environment for everyone, safeguard, natural resources (such as the surface-water, ground-water and soil), and provide people with safety, security, and dignity when they defecate or urinate.

## I. INTRODUCTION

The Globe Health Agency has declared the newest corona virus (COVID-19) outbreak a pandemic and a global public health crisis, and the whole globe is fighting to combat it. It's a situation that's always shifting and altering. In the five months since the virus initially surfaced in December 2019, about two million individuals in 185 countries have been identified as confirmed instances of corona virus disease.(COVID-19). Researchers from all across the world are attempting to better understand the biology and epidemiology of COVID-19, a new corona virus illness (COVID-19).The projected basic reproduction number is substantially larger than that have many other infectious illnesses, and this might cause health-care facilities to become overburdened, even in nations with the most modern healthcare systems. Around 20% of cases result in clinically significant and

complicated diseases. Adults over 60 years of age with co-morbid diseases are the most susceptible group, with occasional infrequent incidences of serious illness in younger people. Non-therapeutic techniques to stop the virus from spreading are the most effective way to halt it because no viable booster or antiviral drugs have yet been approved for the sickness. As a result of the pandemic, it is evident that in the coming days, improvements in basic water, sanitation, and health-care facilities must be a key priority. The present scenario in Bangladesh's COVID-19 districts (Dhaka, Barishal, Madaripur, and Jamalpur) is described in this article, along with some suggestions for how the government could address the pandemic.

## II. DETAILS OF THIS STUDY

➤ The To investigate the current state of health and

sanitation services in four districts Bangladesh.

- To contrast the current situation with the ideal situation.
- To determine the constraints of Bangladesh's present health and sanitation services in four districts.
- To make some suggestions for improving the research location's current circumstance.

### III. LITERATURE REVIEW

This paper examines the history, successes, and problems of a critical part of Bangladeshi hygiene, specifically, moving people away from open defecation and toward the use of sanitary latrines. The Bangladesh case has taken on worldwide relevance now that the newly stated Sustainable Development Goals include a goal to "Make sure access to safe and affordable safe and affordable drinking water for all" by 2030. Bangladesh has mostly succeeded in encouraging people to use latrines and decreasing open defecation to less than 1% of the population. Although every country environment is unique, reviewing the procedures that led to this success may be informative for others. Because no vaccinations or antiretroviral medications have been licensed for the disease, non-therapeutic methods to stop the virus from spreading are the most effective way to prevent it. Hundreds of millions of people are staying at home throughout the world to prevent the virus from spreading. Preventive measures, such as eremite office activities, foreign travel restrictions, obligatory lockdowns, and social isolation, are being implemented in several nations. Bangladesh, a low-income country with one of the world's densest populations, is fighting to contain the disease's spread. In this article, we outline the present COVID-19 situation in Bangladesh and offer some suggestions on how the government might tackle the epidemic [1].

### IV. WORK PROCEDURE

**1.1 Study Area:** Dhaka 21%, Barishal 30%, Madaripur23%, Jamalpur26% Fig-1:

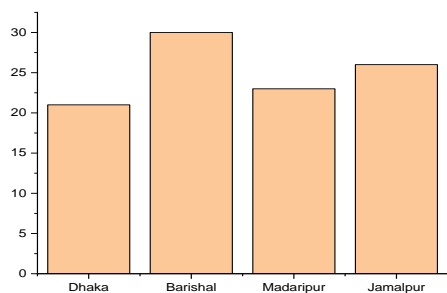


Figure 1: The Area location of the respondent.

**1.2: Bangladesh Sanitation History:** Bangladesh is a hub of research and development in the field of sanitation. It is well-known across the globe as the first place where Community-Led Total Sanitary (CLTS) was employed to eradicate open defecation from whole villages. The usage of latrines has increased substantially since then, yet this success is built on a broad base. Intensive sanitation promotion in Bangladesh dates back to the 1960s and has a long and convoluted history [2].

**1.3: Community-led total sanitation:** As previously stated, the Community-led Total Sanitation (CLTS) technique was initially created in Bangladesh in the rural working areas of Water Aid Bangladesh-affiliated NGO, VERC (the Village Education Resource Centre). This strategy is based on a participatory approach to sustainable development and the recognition that successful control of fecal-oral disease transmission necessitates community-wide transformation. Neighbors are put on danger if even one home fails to use a latrine. It is expected that if people comprehend the benefits of "complete sanitation," they will continue to use latrines when the intervention ends. Persuasive "ignition" actions that "trigger" transformation are essential to the process. As societal standards shift, shaming open defecators is typically an element of the strategy. Volunteer "Rural Engineers" are taught to bring improved toilet technology to their neighbors. Subsidies at the household level are not available. Kar and Chambers (Kar and Chambers, 2008) CLTS has had a significant impact on Bangladesh's sanitation system, while not being the only technique utilized to encourage latrine use and related hygiene modifications. Many other groups adopted CLTS, principles and procedures to their own aims and methods as word of its success in rural areas spread. There have been a number of "complete sanitation" solutions developed. In 2004, a major initiative called dishari began to scale up the approach to the level of a whole union, putting the union chairman and council in control of the ignition and triggering process and supporting a staff post to handle sanitation concerns within the union office. Plan Bangladesh, Dhaka Ahsania Mission, and the HYSAWA Fund all included an emphasis on the union in their water and sanitation efforts. UNICEF launched the School-Led Total Sanitation (SLTS) initiative, which has evolved into Community Approaches to Total Sanitation (CATS) [3].

**1.4: Emergency Sanitation:** The administrative and technical techniques necessary to provide sanitation in an emergency are known as emergency sanitation. During humanitarian assistance activities for refugees, victims of natural catastrophes, and internally displaced individuals, emergency sanitation is essential. The Emergency

response is divided into three phases: immediate, short-term, and long-term. The immediate focus is on controlling open defecation, for development toilet technology, different type toilet being used. Technology such as urine-diverting dry toilets, tanks, and decentralized systems might be deployed inside the near term. Hand washing stations and fecal sludge management are also included in emergency sanitation.

**1.5: Hygiene Challenges:** The hygiene issue encompasses a variety of human actions that, in addition to latrine usage, help to minimize diarrheal illness transmission by interrupting fecal-oral transmission chains. Hand washing, covering stored water and food, and solid waste management are examples of these habits. Menstrual hygiene management (MHM) is a new hygiene issue that has ramifications for women's health and girls' education, according to sanitation specialists. According to the above-mentioned national hygiene study, less than half of all family latrines provided soap and water for hand washing. Given that hand washing reduces the risk of disease transmission even more than latrine use, this issue warrants special attention in the next phase of sanitation programs. During the last two or three years, the international WASH community has paid renewed attention to the issue of menstrual hygiene management. Given how often the phenomena of menstruation are connected with shame and dread, this is a significant shift. Recent professional conversations have stressed the idea that menstruation is a natural and normal part of life, and that humiliating menstrual girls harms their self-esteem, violates their rights, and disrupts their education. Men and boys, girls and women, as well as local authorities, are having discussions about this issue in try to modify everyone's perspectives. In order for school girls to feel comfortable attending school during their menstrual periods, more emphasis is being paid to providing safe and adequate facilities where they may change or dispose of pads, and so on. To ensure that safe pads are inexpensive, NGOs and others are distributing new types of pads made from locally accessible materials (used fabric, for example). According to the Bangladesh Government's June 2015 directive; schools must include girl-friendly toilet facilities. This is a huge step in the right direction for the new trend. Although water is essential for practically all hygiene-related operations, engineers are not tasked with addressing personal hygiene behaviours. It is a duty of health education. The ministries of health and education both have staff and knowledge that are well-suited to dealing with sanitary issues. However, important interviewees say that the Ministries of Health and Education are not yet properly involved with sanitation concerns. Government officials should take advantage of

this chance to strengthen inter-ministerial collaboration in order to reaffirm the nation's sanitation accomplishments' public health advantages. In order to feed the world's rising urban populations, wastewater is increasingly being seen as a viable supply of water and nutrients for agricultural development.

#### **1.6: The Benefits of improving sanitation:**

The advantages of improved sanitation go well beyond lowering the incidence of diarrhea [4]. These include:

- Reducing the spread of neglected tropical diseases such as intestinal worms, intestinal parasites, and respiratory disease, which affect millions of people.
- Malnutrition's severity and impact are being reduced.
- Increasing respect and protection, particularly for the female and younger girls.
- Rising student participation: Girls' attendance is increased when separate sanitary facilities are provided.
- Water, renewable energy, nutrients might be recovered from face waste.

#### **1.7: Bangladesh's Response to COVID-19:**

Bangladesh government confirmed the first COVID-19 case on its soil on March 7, however numerous experts believe that nCoV-2 may have invaded the country earlier but remained unnoticed due to inadequate surveillance. As of April 13, COVID-19 has been documented in 803 cases across the country, with 39 fatalities. However, there have been concerns that the country's testing assays are poor, resulting in many cases going undetected. In response to the emergence of the virus, Bangladesh government reduced international flights and inside flights thermal scanner inspections for passengers, and closed schools; open a few industry and company for work March 26. On March 15, the country banned all European flights save those from the United Kingdom; nonetheless, planes from Europe were still allowed to land at airports. As a result, over 631 thousand migrants arrived in the country in just 55 days, starting on January 21. The Institute of Epidemiology, Disease Control and Research (IEDCR) claimed to have tested everyone who entered the country, although the testing facilities at the ports of entry have been widely questioned. All travelers entering the country were subjected to a 14-day compulsory quarantine beginning March 16. It aimed to take tourists to a quarantine facility from Italy, which had become a new pandemic hotspot. Due to a lack of preparedness, the operation was widely criticized, and the passengers were allowed to enter the country on the condition of conscience

for 14 days [5].

### 1.8: Better and Unpaved Sanitation:

Inadequate sanitation (also known as "access to adequate sanitation service") is a monitoring term that is used to characterize several types of sanitation. This is the term for the management of human waste at the household level). In the JMP definitions, "unimproved sanitation" is the polar opposite of "improved sanitation." From 2015 onwards, the same words are used to track progress toward Sustainable Development Goal 6. They are a part of the definition of "safely managed sanitation service" in this case [6].

**1.9: The Impact of Covid-19 on Bangladesh & Key findings of the survey:** In recent weeks, I spoke with a number of social activists and non-governmental organization (NGO) campaigners in Bangladesh about the impact of the corona virus on their country. Many people are afraid to express their worries and opinions about their government's response to the epidemic in public, especially to members of the foreign media and non-governmental organizations (NGOs). Bangladesh's government appears to have been suppressing free expression since the middle of March 2020, according to a Human Rights Watch assessment. Rather than giving correct and timely information about the virus, the authorities are detaining people, including students, activists, and even physicians, and accusing them of spreading rumors and disinformation about Covid-19's effects on the public. The Information Ministry is currently monitoring social media and numerous television stations for "rumors" concerning Covid-19 cases, citing the draconian Digital Security Act. The findings of the poll examine the impact of COVID-19 on businesses and their answers to the issues they face. The poll also inquired about current government assistance as well as the short- and long-term options that respondents want to seek in order to deal with COVID-19. The survey included respondents from the textile, clothing, leather, food and beverage, chemical, including pharmaceuticals, plastic, furniture, printing, machinery, and other sectors, such as wood, recycling, and other transport equipment [7].

### 1.10: Starvation Defies Lockdown:

The corona virus pandemic and the nearest have disproportionately affected people from lower socioeconomic strata, as has been the case worldwide. According to the Bangladesh Bureau of Statistics, at least 10 million of Bangladesh's 25 million wage and salary employees rely on their daily salaries. Thousands of frightened textile workers traveled several kilometers to preserve their jobs after the lockdown was announced,

despite the lack of transportation. Many others just walked out in search of food, hunger and despair driving them. The government's emergency food aid initiatives are limited. Many activist organizations have found it increasingly difficult to continue their humanitarian activities after the lockdown began in the second week [8].

**1.11: Overwhelmed Health System:** Due to the knowledge that Covid-19 had been circulating throughout Asia for two months, the Bangladeshi health system was unprepared. The advent of the corona virus has aggravated the problem, making it inevitable. Exams are few. The number of persons who have tested positive does not accurately reflect the problem due to a scarcity of testing. The administration also looks to be striving to hide the real numbers. Activists have termed the government's plan a "No test-No Corona" policy.

**1.12: Safely Managed Sanitation:** COVID-19 has wreaked havoc on educational standards throughout the world, prompting the great majority of pupils to temporarily drop out. With about 40 million students enrolled, Bangladesh is one of the countries most affected by total school closures. Administrators must guarantee that children's learning time and well-being are preserved during this period because all schools will be closed for at least two months. The Corona virus pandemic, regardless of its effects on family poverty, will have a direct influence on learning outcomes by lowering time spent in learning activities both in and out of school. While classroom disturbance is common, learning deprivation outside of the classroom varies depending on the family's economic situation, access to technology, and parental abilities. At home, there is likely to be a gendered reaction to children's educational demands. If allowed to continue, the state-wide strike risks wiping out some of the country's previous educational achievements, such as near-universal primary school attendance and gender parity in secondary education. A multi-respondent survey will be used to acquire primary data for this study.

**1.13: The Impact of Corona virus on Livelihood:** 2020-03-08, Bangladesh saw its first official instance of Covid-19 death. Bangladesh, like other countries across the world, has decided to put the country on formal lockdown starting March 26, 2020, in order to curb the spread and prevent communal transmission. While most of the service industry can benefit from work-from-home agreements, the lockdown has put 85 percent of the country's working population, who are now employed in the informal sector, out of work. These workers are the most vulnerable category during this national economic downturn due to a lack of effective job benefits and pay structures. The bulk of these employees are in the low- and lower-middle-income categories, earning barely enough to meet their



living expenses while living in the outskirts of cities. As a result, a loss of job or income would have a direct impact on the lives of these urban LIC and LMIC employees, exposing them to the negative consequences of the economic downturn and driving them to the point of no return. According to the survey, respondents' average age was 35 years old, and their average monthly income prior to Covid-19 was BDT 20,193. Each wage earner was found to sustain the lives of about three dependent family members, with 54 percent of homes having only one wage earner. Respondents were from a variety of occupations, with a higher percentage of RMG and manufacturing sector workers in the greater Dhaka North (Gazipur, Ashulia) and the larger Dhaka East (Narayanganj). Domestic assistance, shop personnel, restaurant staff, and office support staff, among others, were among the respondents in the Dhaka Metro (Mirpur, Tejgaon, Korail).

**2.1: Geographic of this study, Distribution of the Respondents:** Employers in both the public and commercial sectors were asked if they are aware of their employees' susceptibility and risk, if they provide support, and what future plans they have to enhance their employees' health and safety. Dhaka accounted for more over half of the responses, owing to the enormous number of sanitation and trash employees employed by the two City Corporations (45 percent). Telephone interviews were performed from 2020-05-08 to 2020-05-16. On average, each interview lasted around one hour. Water Aid Bangladesh prepared the questionnaire, and the organization's personnel performed all of the interviews. Staff got extensive training on how to conduct interviews and collect data using the Water platform. On the same platform, the data was analyzed. Prior to each interview, informed consent was obtained, and each interviewee was compensated for their time.

**2.2: The study's main concerns are as follows:**

- COVID-19 is well-known within sanitation and trash employees.
- COVID-19 information sources.
- Safety equipment is readily accessible and can be used.
- Usage, cleaning, and reuse of personal safety equipment currently in use.
- Practices are being followed of hand hygiene in the workplace.
- During COVID-19, there will be no existing guidelines.
- If and how service demand has altered as a result of COVID-19, as well as the financial

implications for workers.

- The main difficulties that employees face.
- As part of the government's reaction to COVID-19, be aware of any special support, such as insurance, financial compensation, or relief measures.

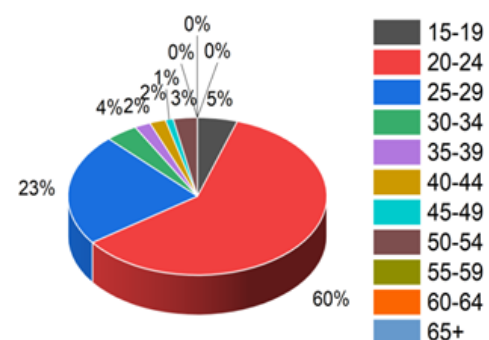
*Table 1. Total Covid-19 Confirm Cases and Total Deaths up to December 2020*

Location (Our Districts)	Month	Confirm Cases	Confirm Deaths
Dhaka	March-December	7076	248
Barisal	March-December	3032	34
Madaripur	March-December	2033	21
Jamalpur	March-December	1512	26
	<b>Total</b>	13653	329

## V. QUESTIONERS SURVEY

### 1. What is the age range?

The age range of the respondent below the chart Figure 2.

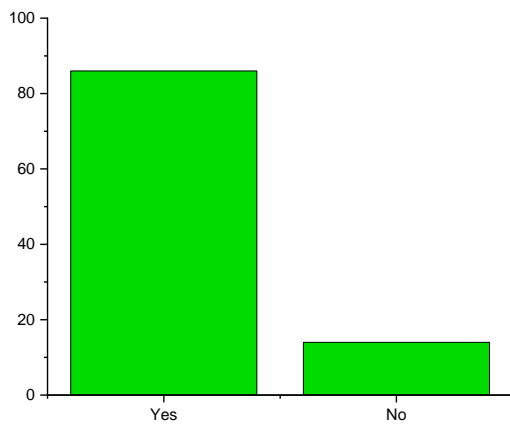


*Fig.2: The Age range of the respondent.*

### 2. Do you have any idea in COVID 19?

About any idea of the covid-19

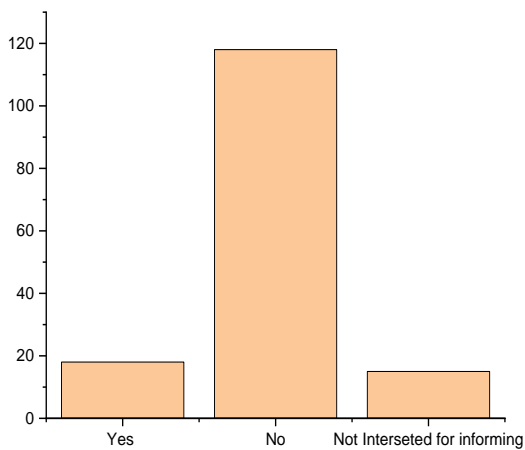
Respondent below the chart Figure: 3.



**Figure 3:** Covid-19 ideas in survey area

3. Do you have anyone COVID 19 positive in your family?

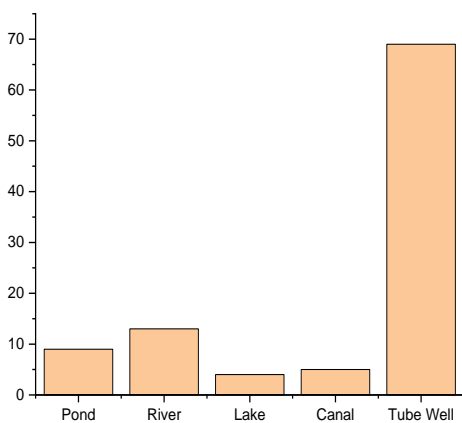
Respondent below the chart Figure: 4.



**Figure 4:** Presents of Covid-19 positive cases in your family.

4. What is your water source?

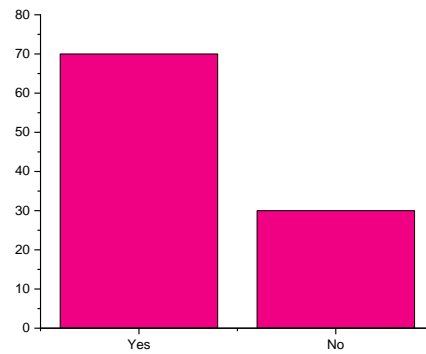
Respondent below the chart Figure: 5.



**Figure 5:** Sources of water of the respondent.

5. Do you purify your water?

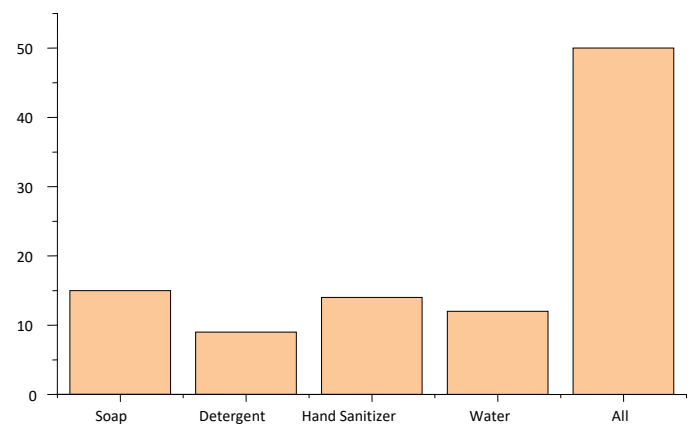
Respondent below the chart Figure: 6.



**Figure 6:** Purifying of water

6. What percent of cleaning area?

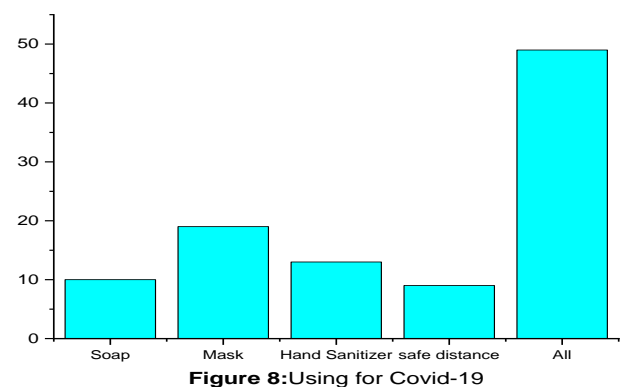
Respondent below the chart Figure: 7.



**Figure 7:** Use for cleaning in the survey area.

7. What do you use for Covid-19?

Respondent below the chart Figure: 8.



**Figure 8:** Using for Covid-19

## VI. CONCLUSION

The goal of this study was to look at water consumption, basic sanitation facility availability, and environmental sanitation and health service conditions during the COVID-19 outbreak in four Bangladeshi districts. In our district, this investigation was conducted at the home level. In the research, the majority of families had renovated own toilets. Pit toilets accounted for nearly half of the upgraded toilets. Despite having a clear awareness of the benefits of having toilet facilities, a large percentage of families in the study region continued to utilize unimproved toilet facilities. As a result of this condition, improved basic sanitary facilities are inaccessible. Inadequate service levels in study areas might be viewed as an opportunity for more targeted changes aimed at improving access to improved water and sanitation services. In order to prevent and safeguard human health during any infectious disease epidemics, including corona virus illness, health services, sanitation, and sanitary surroundings are required COVID-19. Bangladesh, as a lower-middle-income country, has so far faced significant challenges in controlling the virus's spread. The government must increase its testing and healthcare facilities while maintaining the lockdown at all costs with tougher upkeep. It must maintain a steady supply of personal protective equipment (PPE) for healthcare professionals. 77.8% of the people in the selected districts do not receive emergency healthcare, and 49 percent of the people in the selected districts do not get primary healthcare support, affecting 65 thousand individuals.

## ACKNOWLEDGEMENTS

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## REFERENCES

- [1] BBC News. Corona virus: Bangladesh Locks Down a Million in Rohingya Camps. (2020). Available online at: <https://www.bbc.com/news/world-asia-52227924>
- [2] <https://opendocs.ids.ac.uk/opendocs/bitstream/handle/20.500.12413/15527/LP2%20Bangladesh%E2%80%99s%20sanitation%20achievements%20and%20the%20second%20generation%20challenges%20-%20Hanchett.pdf?sequence=3&isAllowed=y>
- [3] <https://www.communityledtotalsanitation.org/page/clts-approach>
- [4] <https://www.who.int/news-room/fact-sheets/detail/sanitation>
- [5] <https://www.worldbank.org/en/news/video/2022/04/06/bangladesh-s-response-to-covid-19-and-its-future-preparedness>
- [6] <https://www.who.int/data/nutrition/nlis/info/improved-sanitation-facilities-and-drinking-water-sources>
- [7] <https://www.unido.org/sites/default/files/files/2021-03/UNIDO%20COVID19%20Assessment%20Bangladesh%20FINAL.pdf>
- [8] <https://www.arabnews.com/node/1658186/world>
- [9] Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, et al. Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. *NEJM* (2020) 382:1199–207. doi: 10.1056/NEJMoa2001316 PubMed Abstract | CrossRef Full Text | Google Scholar
- [10] Bootsma MCJ, Ferguson NM. The effect of public health measures on the 1918 influenza pandemic in U.S. cities. *Proc Natl Acad Sci USA*. (2007) 104:7588–93. doi: 10.1073/pnas.0611071104 PubMed Abstract | CrossRef Full Text | Google Scholar
- [11] Perera W. Bangladesh Government Downplays COVID-19 Threat as Job Losses Mount (2020). Available online at: <https://www.wsns.org/en/articles/2020/03/16/bang-m16.html> (accessed March 26, 2020). Google Scholar
- [12] Directorate General of Health Services. Novel Corona virus (COVID-19) Press Release (2020). Available online at: <https://www.dghs.gov.bd/index.php/en/home/5373-novel-coronavirus-covid-19-press-release> (accessed April 11, 2020). Google Scholar
- [13] Institute of Epidemiology DC and R. COVID-19. (2020). Available online at: <https://www.iedcr.gov.bd/index.php/component/content/article/73-ncov-2019> (accessed April 11, 2020). Google Scholar
- [14] World meter. Covid-19 Corona virus Pandemic (2020). Available online at [www.worldometers.info/coronavirus/](http://www.worldometers.info/coronavirus/) (accessed April 13, 2020).
- [15] Javed HAI. Passengers from Europe Land in Dhaka Despite Ban. (2020). Available online at: <https://www.dhakatribune.com/bangladesh/dhaka/2020/03/16/defying-bar-european-flight-lands-in-dhaka> Google Scholar