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One and a Half Years into the Pandemic in Bangladesh: What Have We Learned So Far?

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Abstract

This survey paper compiles the major works on COVID-19 related issues in Bangladesh and intends to take stock of our knowledge and inform policies for better management of the pandemic. We find i) migration patterns can be utilized for better targeting of vulnerable areas without adequate testing and tracing; ii) contrary to the predicted V-shape economic recovery, a CGE model-based exercise suggests a 3.7 percent decline in output; iii) the initial decline in export is primarily due to demand shocks in the destination countries; iv) micro and small enterprises are the worst impacted sectors which need the most government funding; v) the relief package and enhanced social safety-net support for the vulnerable are largely inadequate, inefficient and fraught with delays; vi) 1.5 years of school closure and resulted learning loss is enormous and most likely irreparable; vii) pandemic induced income shocks have triggered more incidences of child-marriage and possible school dropouts for females; viii) vaccine hesitancy is very low, implying adequate supply can bring about a high vaccination rate; ix) severe impact on mental health has been found, demanding special attention,and x) the widespread provision of the correct information is critical to fighting misinformation and misconception about COVID-19.

***Keywords**:* Bangladesh, COVID-19, Pandemic

Introduction

As of August 16, 2021, the COVID-19 virus had dramatically affected both the economic and social lives of Bangladeshis, with about 1.43 million confirmed cases and more than 24 thousand confirmed deaths. To contain the virus's first wave in early 2020, the government ordered limits on economic activities and travel from late March to May. These measures to restrict the transmission of the virus, combined with pervasive anxieties related to the pandemic, have had a substantial adverse impact on the country, and in particular, on the economy. Later, periodic shutdowns of economic activity, and varying degrees of restraints on the movement of people were imposed.

Bangladesh has also suffered from its interdependence with western countries, which have seen a number of surges in COVID-19 cases and several rounds of lockdowns and other restrictions over the past year and a half.

This paper aims at taking stock of the current evidence on a host of issues having a bearing on the identification of COVID-19 hotspots using migration patterns, impacts on various socio-economic and psychological variables, use of non-pharmaceutical interventions, and vaccines. We have divided these issues into eight broad topics, and these are: i) identification of COVID-19 hotspots using migration data, ii) macroeconomic impacts of COVID-19, iii) impact on employment and enterprises, iv) food security and safety nets, v) awareness building, behavioral change and use of masks, vi) education, child marriage, and women, vii) vaccines and vaccination, and viii) mental health.

A large volume of works on the socio-economic impacts and other relevant aspects of COVID-19 has been conducted in the context of Bangladesh. A search in Google Scholar with three keywords "COVID-19 Bangladesh socio-economic," returns 18 thousand entries. However, we were very selective in choosing the papers considering their relevance and methodological rigor. We have considered both published journal articles and unpublished manuscripts, which are mostly working papers. In the end, we have reviewed 71 manuscripts for this review article.

As the title of the paper suggests, we compiled the major issues and lessons learned from existing studies. The current body of evidence can help us better manage the current pandemic. This evidence can also help if there is an outbreak of the pandemic in the future, which is not very unlikely. If another pandemic occurs in the next decade, for example, what lessons can we draw from this pandemic so that we can manage the future one better? The main messages from this review paper are the following. First, the capacity for testing and tracing the disease for isolating the infected ones is very limited in developing countries. A low-cost method of identifying the hotspots can be implemented for targeted quarantine using migration data, both domestic and international. Districts and sub-districts with a higher number of domestic and international migrants are the potential hotspots of COVID-19, as found during the first wave of the pandemic. The studies find a strong correlation between migrants and their home districts and sub-districts.

Second, the impact of the pandemic on the economy does not stem from the disease itself but from the host of non-pharmaceutical measures taken by the government. Since yearly measured GDP data cannot be available to assess the immediate and short-run impact, some alternative measures such as electricity consumption, mobile financial services, etc., indicate that a dip in the economy occurred during the period of lockdown, after which it rebounded quickly. A CGE type model predicts that a three to four percent contraction of the economy can be attributed to the pandemic. The decline in export is largely due to the drop in demand in the destination countries; the role of supply shocks in the input sourcing countries is very low. Hence the management of the demand shocks should be the priority in boosting exports during the pandemic.

Third, micro and small enterprises bore the greatest brunt of the pandemic. In the early period of the outbreak, it was estimated that about two-thirds of the SMEs had experienced a reduction in revenue during 2020, and this loss continued in subsequent months in 2020-2021. The service sector, which requires person-to-person contacts, was the worst victim of the pandemic. It is also found that female workers lost more jobs than their male counterparts when a beauty parlor and a light engineering enterprise were compared. Workers living the large cities and metropolitan areas are found to be more vulnerable to losing their jobs. Empirical findings on micro and small enterprises and their workers can help policymakers to prioritize the sectors for disbursing the bailout packages. The key message is that the survival of the micro and small enterprises and the revival of the economy critically hinge on the efficiency of the government's incentive packages in reaching those that are most affected.

Fourth, food insecurity is an important issue to address during the pandemic. The extent of food insecurity varies substantially across occupations. Casual workers and day-laborers suffer the most during the pandemic. This impact is found to be more severe in urban areas than rural ones. It is worth noting that, in recent years, non-agricultural income out-shares agricultural income in rural areas of Bangladesh. Though the agricultural sector was more or less unscathed by the pandemic, this does not guarantee that the rural households are food secured. Moreover, those living in rural areas are less aware of available government packages, making them more vulnerable. An important lesson is that food insecurity can be severe in both rural and urban areas, and occupational targeting is required to minimize such shocks.

Moreover, the government-provided relief and extended safety-net package were found to be largely ineffective. Pervasive inefficiency in the support distribution, and unclear targeting mechanism, exacerbated the

sufferings of the vulnerable. Delay in the regular transfers of the safety-net support during the time of pandemic also caused concern. This compromised the food security and general well-being of the benefit recipients. The system of transferring monetary support using the digital financial system, such as mobile banking, showed promise in terms of rapid and timely delivery of the benefits – demonstrating the importance of widespread adoption of such a system for government-to-person (G2P) transfers.

Fifth, information provision is a key tool for combating misinformation, misconception, and malpractice for preventing the spread of disease. People tend to underestimate the large risks associated with disease, and this is more so when it requires pro-social behavior. That is, self-compliance with non-pharmaceutical measures is required not only for the safety of the individuals but for the wider community, and this information has to be communicated properly involving community and religious leaders. The use of local terms avoiding technical jargon is critical in reaching out to people. In essence, gaining the trust of the people and designing a holistic campaign strategy can help align the risk perception of the government and the citizens.

Sixth, like the virus, the impact of the pandemic on education is invisible but deadly; the side effects are expected to be long-lasting, and their extent is still unknown. Learning lost due to the closure of the schools is found to be very high and may not be amendable. This impact is higher for girls as they are more involved in household chores and caregiving. The pandemic has also forced younger girls to drop out of school and get married, making child marriage an important social issue during the pandemic.

Seventh, the low rate of vaccination is primarily a supply-side problem in Bangladesh since vaccine hesitancy is found to be very low. About three-fourths of study participants were found to be willing to get inoculated. Willingness to pay is also not low, as one study found that respondents are willing to pay the equivalent of about seven US dollars for vaccines. As the government of Bangladesh has announced that the vaccines will be available for free, a low hesitancy suggests that the vaccine coverage will be very high once the supply is ensured.

Eighth, the impact of the pandemic on mental health, manifested in an inflated level of stress, anxiety, and depression, has been found to be acute. Comparing with pre-COVID periods, studies have found about two to three times increase in psychiatric disorders during the pandemic. Women are found to be more vulnerable than men. Health care professionals are particularly susceptible to COVID-related fear, restlessness, and depression. Closure of schools has also led to increased depression and anxiety among students who are more worried about delays in their academic lives. Hence, taking care of mental health is as important as physical health during the pandemic, and institutional supports should be in place to serve a wide range of the population.

The rest of the paper is organized as follows. The next section describes the nine issues we refer to above. The final section concludes.

Issues and Lessons Learned

Identification of COVID-19 Hotspots Using Migration Data

There is a tradeoff between quarantining the whole population with high economic costs and testing with targeted quarantine (Barnett-Howell and Mobarak, 2020). Since testing is costly and time-consuming, targeted quarantine can be implemented using the knowledge of potential hotspots based on migrant and traveler data. Two cross-country studies, with a special focus on Bangladesh, use international and domestic migration patterns to predict hotspot regions within, as well as across, countries. Humans carry the disease, and if there is a systematic pattern of human movements from one place to another, we can predict vulnerable places even before the disease is spread. To identify the spatial distribution of the risk from COVID-19, these studies use the information on migration to identify the hotspots. The hypothesis is that the migrants traveling from already exposed countries can carry the disease to their home countries. Moreover, in the case of domestic migration, work related travel from one district to another can also result in the spread of the disease.

Ahsan, Iqbal, Khan, Mobarak, and Shonchoy (2020) construct a risk exposure index of COVID-19 for countries using information on bilateral migration and COVID-19 cases of the countries that the migrants are traveling from. They find that the index can significantly predict the current number of confirmed COVID cases in the host country. The same methodology is used to construct the index at the sub-national level in Bangladesh, and finds that

the confirmed cases are higher in those districts with higher international migrants who migrated to worse affected countries. To validate the results, the study uses airport disembarkation card data from CAAB to identify the origin districts of the travelers and link this to the existing COVID-19 cases. Travelers' districts of origin and the extent of spread of COVID-19 have been found to be highly correlated in this study. The result is consistent with other measures of district-level migrants measured from 2016 Household Income and Expenditure Survey (HIES).

Lee, Mahmud, Morduch, Ravindran, and Shonchoy (2021) use the movement of both domestic and international migrants to predict the spread of the disease within a country (Bangladesh, India, and Pakistan). Their estimates show that one standard deviation increase in domestic migration increases the probability of COVID-19 cases by three percent in Bangladesh and 11 percent in India. Interestingly, it decreases the probability in Pakistan.

In a related paper, Shonchoy, Mahzab, and Mahmood (2021) construct a contagion risk index to measure disease spread. Using five sets of indicators - socio-economic, demographic, occupation, migration, and health infrastructure, their constructed index shows a strong and robust correlation (0.61) with sub-national COVID-19 cases across Bangladesh.

It is also worth noting that the COVID-19 symptoms in the host community of Rohingya camps in the Cox's Bazar district are found to be strongly correlated with return migration, mobility of individuals, and food insecurity (Lopez-Pena, Davis, Mobarak, and Raihan, 2020).

Macroeconomic Impacts of COVID-19

The COVID-19 pandemic has been creating an unprecedented global economic crisis. For a developing country like Bangladesh, the effects are expected to be even worse. The disease has impacted the economy in three broad ways. First, the disease itself has high costs related to mortality and morbidity. Second, there is an impact on the economy through various non-pharmaceutical measures such as lockdowns and social distancing. Third, slowing down of the global economy, particularly those in the West, tends to shrink the export volume.

After the first round of lockdown, the Bangladesh Institute of Development Studies (BIDS) prepared a note on the rapid assessment of the impact of COVID-19 and the lockdown on the economy, using high-frequency secondary data such as electricity consumption, remittances, deposits, credit, agent banking and mobile financial services (BIDS, 2021). In the first six months of the pandemic, the adverse impact of COVID-19 was found to be largely restricted to the period of the lockdown; the impact was worst in the first month of the lockdown. The economy seemed to turn around in the second month of the lockdown. A V-shaped recovery appeared very likely in the early period. It was argued that since agriculture was mostly insulated from the lockdown, the livelihoods of about 40 percent of the rural population remained largely unscathed. However, the medium-term impact of the pandemic remained unexplored.

Another systematic analysis of the macroeconomic impact is also short-term in nature. Using a CGE framework, S. H. Rahman, Razzaque, Rahman, and Shadat (2020) argued that the short-term impact is channeled through lower demand and supply in the domestic market and disruptions in international trade and financial flows. To analyze the impact of shocks, the study uses the GTAP model incorporated into a social accounting matrix multiplier model. Four sets of shocks have been analyzed in the model –consumption demand shock, oil price shock, tourism shock, and trade shock. Each of these shocks has been categorized into low, medium, and high shock scenarios, where a higher level of shock means a greater extent of changes. The first approach shows the impact of the shocks on global economies and finds that without any policy intervention and in a low shock scenario, GDP would decline by $11 billion in 2020, which is 3.7 percent lower than the benchmark level in the absence of COVID-19 pandemic. The impact is larger with medium shock scenarios. The impact on export ranges from about 11 percent to 21 percent lower for Bangladesh, depending on different shock scenarios.

This exercise also includes the impact on household income and poverty. The average household income is expected to be reduced by four to eight percent under different shocks, leading to an increase of the share of the population under the poverty line to 24-28 percent, compared with the pre-COVID-19 rate of 20.5 percent. Hence, the early estimation on the impact of household income and poverty was not high, though the situation worsened over time, as indicated by the results in the food security section below.

COVID-19 pandemic has a devastating impact on international trade and the global value chain, and this impact is expected to be higher for the developing countries, which rely largely on western countries for their exports.

Depressed demand in developed countries has taken a huge toll on merchandise exports from developing countries. Major global suppliers of raw materials and intermediate goods such as China, India, and Brazil are also heavily impacted by the pandemic. Both these demand and supply shocks are likely to reduce the volume of exports of Bangladesh, particularly for the apparel sector.

Ahsan and Iqbal (2021) use firm-level data from Bangladesh to provide the first evidence on the performance of the apparel exporting firms in the early period of the pandemic by separating demand shocks in sourcing countries from supply shocks in input supplying countries. The study documents that during the first half of 2020, Bangladesh's exports declined by 33 percent compared to the previous year. This reduction is hypothesized as the result of two effects. First, the drop in consumer spending on clothing and clothing accessories in destination markets is likely to reduce apparel exports from Bangladesh. Second, the reduction can also be due to the early spread of COVID-19 and other non-pharmaceutical interventions by the government of China. The study finds that the export-demand shock played the dominant role in reducing Bangladesh's apparel exports in the first half of 2020.

Impact on Employment and Enterprises

Murshid, Mahmood, Shashi, and Sarker (2021) document the early impact of COVID-19 on employment using a survey conducted through Facebook. The data represents all socio-economic groups from 64 districts; however, the representation is greater for young and urban workers. People who live in large cities and metropolitan areas are found to be more vulnerable to losing their jobs. However, people with higher levels of education are less likely to be affected by income shocks. Also, the likelihood of reduction of income is higher when the locality experienced more deaths due to COVID-19.

Using surveys on enterprises and workers in the early period of the pandemic in 2020, Iqbal and Pabon (2020) found that 66 percent of enterprises predicted a reduction in revenue due to COVID-19. Larger sectors faced lower losses in revenue. The loss was predicted to be coming from a loss in sales, unsold products in inventory, unpaid receipts, and perishable and non-storable raw materials. Due to disruptions in the supply chain, owners were worried that they would not be able to resume full production even in a month after the shut-down was lifted. Almost 90 percent of owners feared that if the shut-down continued for three months at a stretch, they might have to either wind up their business or survive with huge losses. About 98 percent of the workers were paid in March 2020, either partially or fully. About two-thirds of workers did not think that they would be paid in May 2020. Approximately three-fourths of the SMEs were aware of the incentive package announced by the government. The study noted that the survival of the SME sector critically hinges on how effectively the government's incentive packages reach the most affected SMEs.

Islam and Rahman (2020) conducted two rounds of survey (July 2020 and January 2021) of the light engineering firms and a few service-related enterprises and their workers all over Bangladesh to assess the impacts of COVID-19 on workers. Even though 60 percent of firms were found to be open during the first lockdown (June 2020), almost 97 percent of firms started operating at the beginning of 2021. Although self-reported health guidelines were strictly followed during the first lockdown, the extent of compliance decreased in the following lockdown by 23 percent for mask-wearing and 49 percent for handwashing in the workplace. Sales and use of raw materials have decreased during the first lockdown compared to the pre-COVID time as well, falling further in the second round. In the first round, monthly sales decrease by 56 percent compared to the pre-COVID level, and by 17 percent in the second round. The monthly value of raw materials also fell by 54 and 18 percent, respectively, in rounds one and two. More than 50 percent of the enterprises reported that the price of raw materials might increase due to lockdown.

Interestingly, the recovery of light engineering and service sector firms was found to be the slowest for labor-intensive female sectors, and those with higher health risks. Workers in these sectors are also at high risk. Although the overall unemployment increased by around seven percent between the two surveys, the unemployment rates for females increased to 54 percent in round two compared to 40 percent in round one. Moreover, psychological stress during the pandemic was found to be significantly higher for female workers, particularly those who are unemployed. The results suggest that female workers, particularly those who were in the service sector, were affected more than their male counterparts. Moreover, the percentage decrease in income for female workers was also higher than that of male workers during the first lockdown.

Food Security and Safety Nets

The COVID-19 lockdowns, mobility restrictions, and overall economic downturn have caused significant impacts on vulnerable populations, especially for those who are low-paid, living hand to mouth, residing in the rural areas, and employed in the informal sector casually (Barrett, 2020). These adverse effects include illness (or hospitalization), job or income loss resulting in food insecurity and debt along with concerning effects on mental and psychological well-being. Almost 90 percent of households have faced negative income shocks after the first lockdown was implemented in Bangladesh, with those depending on daily casual labor being affected significantly (WHO, 2020). Ahmed, Islam, Pakrashi, Rahman, and Siddique (2021) conducted a rapid phone survey of 10,000 respondents in Bangladesh to understand the determinants and dynamics of food insecurity and coping strategies adopted by rural households during the pandemic induced lockdown. They found that the main occupation of the household head is a significant determinant of food insecurity. When the household head worked as a casual farmworker or as a day-laborer, the household suffered from food insecurity more intensively than did those headed by farmers or public sector employees. They documented that food insecurity is severe for households that completely lost their income during the pandemic compared to those that lost earnings partially. The coping strategy employed by rural households was concentrated on relying on stored food at home and drawing down on savings. Rural households also used informal borrowing from social networks as a coping mechanism. Shonchoy et al. (2021) documented other coping strategies, such as cutting down spending on food and medication.

Ahmed et al. (2021) conducted a repeat survey on a subset of respondents during the second pandemic wave and found even a more significant impact on food insecurity than the first wave. Among those who were mildly insecure during the first wave, 88 percent reported that they were severely insecure during the second wave. While many studies have found microfinance as a tool to minimize the level of poverty, Ahmed et al. (2021) found that households with microfinance membership are at a higher risk of food insecurity compared to the households who are not members during this pandemic, perhaps due to the regular repayment obligation and losses incurred from enterprise income. T. Rahman, Ahmed, Pakrashi, Siddique, and Islam (2020) confirmed these findings and shed light on future concerns and uncertainty faced by this vulnerable population. They found that rural households who lost their income wholly or partially to be more concerned about their future food security and income. In contrast, income secured households were worried about health and medical treatments.

One widely adopted public policy to tackle food insecurity, poverty, and hunger, especially at times of crisis, is public safety nets. For example, various public food transfer programs have played a vital role for poor and vulnerable households in Bangladesh. The Food Friendly Program (FFP) alone supported 27.5 million people in Bangladesh in the 2019-2020 fiscal year. During the pandemic, the Bangladesh government's assistance includes direct and indirect income support through social safety net interventions and economic support programs aimed at businesses and farmers. In total, the Bangladesh Government allocated Tk 955.74 billion (US$11.24 billion) to social safety net programs; this amounted to 16.8 percent of the total budget and three percent of gross domestic product (GDP) in FY 2020/2021. This allocation is 17 percent higher than the allocation in FY 2019/2020. However, an increased leakage in FFP programs has been found during the pandemic compared with a normal year (S. Chowdhury, Khaled, Raghunathan, and Rashid, 2020).

One relevant policy question is how effective such programs are during the ongoing COVID-19 pandemic. Ironically the FFP program amount and delivery were severely compromised during this pandemic, worsening the adverse conditions of the poor. S. Chowdhury et al. (2020) reported that the average amount of distributed benefit has been eight percent lower in 2020 compared to 2018. Only 64 percent reported receiving their allotted amount (60 KG) in 2020 (March-April) compared to 86 percent in 2018. The shortfall increased in the latter months of 2020, when they received 12.7 KG on average instead of the entitled 30 KG. Although the price per kilogram is the same in 2018 and 2020, recipients reported paying bribes, and the average amount of bribes was higher during the pandemic. Similar suffering has been documented for other safety-nets. A survey of the beneficiaries of the Old Age Allowance (OAA) and the Widow Allowance (WA) during the first lockdown found that most of the households had zero income during the survey period (Shonchoy et al., 2021). Moreover, 41 percent of the OAA and WA beneficiaries reported not receiving the total benefit amount during the pandemic. Those who could get the benefit transfers digitally were more likely to receive the amount on time and suffered less during the lockdown.

Other support programs were implemented to mitigate the effects of the COVID-19 crisis. These included stimulus package to assist migrant workers, unemployed youth, informal sector workers, and support to farmers and micro, small, and medium-sized enterprises. However, only 60 percent of farmers were aware of the package, and among these only five percent applied for the support, and one percent received the loan (Ahmed, Hossain, Siddique,

and Jobe, 2021). Confusion on what is being provided, who is getting it, when will they receive the relief, and how the government would distribute the relief have created a loss of trust in the government (Ali, Hassan, Hossain, and Haque, 2021). Assistance from NGOs has also not been found to have a significant impact on the well-being of these households during the pandemic.

Awareness Building, Behavioral Change, and Use of Masks

People living in rural areas are generally “disconnected” from the digital world of the internet, social media, television, radio, and smartphones (Ahmed and Diesner, 2012), and thereby lacking access to the latest, verified information. As a result, rumors, myths, and misconceptions about the coronavirus are widespread in remote rural areas in developing countries (United Nations, 2020), and can confuse the risks of COVID-19 and worsen the public health crisis (Galvão, 2021). Poor health literacy also aggravates misinformation and makes infection control difficult among the rural poor (Paakkari and Okan, 2020). In addition, people living in remote rural areas, who are predominantly poor, often cannot protect themselves because of their socio-economic conditions (Ravallion, 2020).

Zaman, Rahman, Rabbani, and Matin (2020) reported that socio-economic conditions and cultural diversity play an essential role in perceptions regarding COVID-19 in Bangladesh. Groups such as day laborers do not understand what different public awareness terms (social distancing, lockdown, stay at home, quarantine, etc.) mean. In villages, the term "home," denotes a few close households residing together; hence "home quarantine" is largely misunderstood. Moreover, people have little information on what to do when they get infected. Respondents in studies mentioned the provision of a customer service number at the Institute of Epidemiology, Disease Control and Research (IEDCR). However, they noted that they would prefer talking to health officials in their localities in person rather than consultation by phone. People also often find the service inaccessible due to the high call volumes to these numbers. Misconceptions about suggested treatments can also cause distrust in health systems. This is severe in urban slums where people think that hospitals do not treat patients, but rather kill them if they do not recover soon (Zaman et al., 2020).

Better information may correct misconceptions and change perceptions about risks of infection and fatality, thus changing people's preventive behavior. Sardar (2020) examines this hypothesis using a randomized experiment on households with international migrants stuck in Bangladesh due to travel restrictions. In this experiment, the treatment group received updated information on the total number of COVID-19 cases in their district, the host country, and the fatality rate in Bangladesh and worldwide. This information intervention has been found to positively impact the perception of local prevalence (infection risk) of COVID-19, and negatively affect perceptions regarding the severity of consequences (fatality risk).

Another issue regarding misinformation is stigmatization, which can have adverse public health implications, as it may lead people to avoid both testing and adopting prevention measures. Moreover, it can have a profound direct impact on the mental health of those who are stigmatized (Bharadwaj, Pai, and Suziedelyte, 2017). A leading cause of stigma is the widespread misinformation and false beliefs about COVID-19 that are fueled by rumors circulating in the news (Bursztyn, Rao, Roth, and Yanagizawa-Drott, 2020) and spread through social media platforms (Pennycook, McPhetres, Zhang, Lu, and Rand, 2020). A. Islam, Pakrashi, Vlassopoulos, and Wang (2021) documentthat providing valid information on infection transmission and prevention mechanisms, public guidelines to address social stigma, and the geographic distribution of infection rates improves mental health and reduces stress and anxietysubstantially. Similarly, Siddique, Rahman, Pakrashi, Islam, and Ahmed (2020) find that disseminating information through text messages and phone calls has been the most effective way to improve public awareness and knowledge on COVID-19 precautions. However, both phone calls and text messages combined with phone calls have a more substantial effect on women than men in Bangladesh. Concern about the health of household members is an essentialdriver for women to be more compliant than men. These also have a significant impact on the compliance of households with respect to COVID-related hygiene practices, especially for those who do not have access to televisionor radio, implying they are an important channel to build public health awareness.

The possibility of controlling the disease's spread depends on whether or not people are following preventive measures. Murshid et al. (2021) state that people living in small towns and cities are more likely to follow preventive practices than those living in villages. Knowledge of COVID-19 and income have been found to have a significant impact on protective measures such as mask-wearing and handwashing. Masks were mandated by the government as soon as COVID-19 started to spread in April 2020. About 80 percent of the respondents in their survey reported

wearing masks, but this behavior did not continue in the months that followed. The percentages dropped to 50 percent in May and to 25 percent in June that year.

Abaluck et al. (2021) tested various interventions on 600 villages in Bangladesh to identify the best methods to increase the percentage of people wearing masks. They find that free distribution of masks and role modeling by community leaders do not substantially increase use. However, periodic monitoring of mask use may increase use by 29 percentage points. Monitoring over a longer term (10 weeks) can increase mask usage up to three times than it does in the short term. The intervention that substantially increases the percentage is the combination of four interventions –free distribution of masks, endorsements by community leaders, promotion of mask programs, and monitoring.

Effective responses to COVID-19 depend on how people cooperate with the government in adopting preventive measures (lockdown, social distancing, mask mandates, etc.), testing and healthcare systems. Government policies and communications may have diverse impacts on the acceptance and behavior of communities. Most people, irrespective of gender and occupation, are found to adhere to a lockdown. They are found to be aware of its necessity and how it may restrict the spread of the disease. However, some groups of people are found to be reluctant. These include younger people who believe that God will protect them and those who need to go out to look for work or relief. Although it is difficult to monitor everyone beyond the main roads, patrolling by police and army representatives can significantly result in people staying at home (Ali et al., 2020).

Education, Child Marriage and Women

As the world continues to grapple with the challenges of the COVID-19 pandemic, governments and scholars need to evaluate and improve adopted policies to educate children in these unprecedented times. In parallel, broad outreach is necessary to enhance the uptake of already implemented remedial education programs. Globally, 258 million primary and secondary school-age children were not in school even before the pandemic (Rogers and Sabarwal, 2020). The situation has been exacerbated since the onset of COVID-19, potentially resulting in lower enrollment rates, higher dropout rates, and poorer learning outcomes. In a simulation exercise based on 157 countries, Azevedo, Hasan, Goldemberg, Geven, and Iqbal (2021) found that COVID-19 could reduce the effective years of schooling from 7.9 years to 7 years.

School closures have persisted in Bangladesh since the beginning of the lockdown on March 26, 2020, leading to reduced learning and a high dropout rate. Missing school is also associated with a reduction in the growth of skills among children. Researchers documented a sizable decrease in the average hour of study from 10 to 2 hours a day. School and home study time are found not to be substitutes. Moreover, time usage in non-learning activities (working for the family's economic need; sports, creative activities, and leisure; helping younger siblings in the study, and religious activities) has increased (Beam, Chaparala, Chaterji, and Mukherjee, 2021).

Although children are getting more time with parents, they are spending more time in household activities than homeschooling. For poor households with lower levels of education, it is especially difficult for the parents to homeschool their children. Also, households are more concerned about the health of their children than their ability to continue educational activities. Students who can afford to do so are spending more time with private tutors (Beam et al., 2021).

During the pandemic, the Ministry of Primary and Mass Education and the Ministry of Education in Bangladesh have adopted a multi-modal strategy to deliver educational programs to primary and secondary school students through television, internet, mobile phones, and radio (Sarwar et al., 2020; Biswas, Roy, and Roy, 2020). Academic and co-curricular classes for students and live sessions for parents and teachers have been hosted on TV. However, based on a study by Asadullah (2020), 62 percent of children in rural Bangladesh have access to TVs, and only 25 percent of these students end up following lessons on television. Thus, a sizable fraction of rural children is not taking advantage of televised resources. Beam et al. (2021) mention resource constraints to be a significant barrier to continuing remote education in rural areas. Hassan, Islam, Siddique, and Wang (2020) show a cost-effective way to improve the educational outcomes of resource-constrained children. This paper employs a village-level randomized controlled trial (RCT) design with tele-mentoring intervention. They find the program to improve learning outcomes of treated children by 0.75 standard deviation (SD) points, and to increase homeschooling involvement of treated mothers by 0.64 SD.

The loss in income and school closure during the pandemic forced many children in rural areas to generate income themselves. Makino, Shonchoy, and Wahhaj (2021) analyze the time use of children, plans regarding

children's schooling continuation, and the incidence of child marriages during the school closure. They find that pandemic-induced shocks forced young girls to get married before they reached the minimum legal age of marriage, making them victims of child marriage and school dropout. They also document a sizable, gendered effect on time relocation away from home study. They found a decrease in time allocation for educational activities for girls than boys. On the contrary, the time-use for household activities is higher for girls than for boys during the school closure. This finding was echoed in "UNFPA-UNICEF Global Programme to Accelerate Action to End Child Marriage," a multi-round survey of 960 adolescent girls during the COVID-19 pandemic. In this paper, most of the girls reported spending more time in caregiving and household work. The pandemic's impact also deteriorated girls' psychological health since they have been experiencing stress and isolation (Amin, 2021).

The gendered effect of pandemics also includes higher incidences of domestic violence. Murshid et al. (2021) reported that 6.03 percent of the respondents reported physical and verbal violence, whereas 93.97 percent reported they face more verbal violence in the household. The frequencies of the quarrels in the household are higher for more than 15 percent of the respondents. Furthermore, 19.36 percent of respondents reported being highly insecure/unsafe during the lockdown due to increased crime and social instability.

Vaccines and Vaccination

It is an astonishing feat of modern medicine that within a year since the identification of the SARS-CoV-2 virus in late 2019 (Coronaviridae Study Group of the International, 2020) and the announcement of COVID-19 as a public health emergency of international concern by the WHO in early 2020, a number of effective vaccines against the infection have been developed. Over time, the COVID-19 virus has naturally mutated, and more virulent variants have emerged. However, most of the vaccines have largely proved to be effective against the new strains so far. One should note that vaccines are most effective against the severity of the disease and less so against being infected by COVID-19. Hence, vaccines have lowered hospitalization, the need for oxygen and ventilators, and mortality. The COVID-19 vaccines have been associated with certain risks, most notably, with increased incidence of developing blood clots and heart inflammation. Such "likely association" has led regulatory bodies to include warning labels. However, the adverse outcomes have been extremely rare, and so far, the benefits are believed to outweigh the rare risks of vaccinations.

In this context, the emerging "social science" and "public health" literature on COVID-19 vaccines have largely looked at attitudes towards vaccines, highlighting vaccine hesitancy and willingness to vaccinate along with different socio-economic determinants. We should note Bangladesh is considered one of the least vaccine-hesitant countries in the world (De Figueiredo, Simas, Karafillakis, Paterson, and Larson, 2020). However, the attitudes towards vaccines are typically gauged by childhood immunization, which is high because of the highly successful Expanded Program on Immunization (Adams et al., 2013). Hence, one can potentially hypothesize that overall hesitancy is a minor issue in Bangladesh, and supply-side issues will possibly contribute more towards vaccine uptakes.

The low hesitancy towards COVID-19 vaccines largely holds true in the literature that we have come across. Abedin et al. (2021) find the intention to be vaccinated at 74.5 percent, with a slightly higher rate among men (possibly due to a higher perceived exposure to the infection because of their being more mobile). Higher-income individuals reported a higher level of interest in getting vaccinated. Only 8.5 percent of the respondents state a complete unwillingness to be vaccinated. The low hesitancy is confirmed by other studies. Haque et al. (2021) find 87 percent of the respondents are willing to be vaccinated if the government recommends it. Not only that, 80 percent of the respondents suggested that government should mandate the vaccination; this is quite unique and even at odds with attitudes towards mandatory vaccinations in other countries. Other studies also find high vaccine acceptance rates. Ali and Hossain (2021) report a vaccine hesitancy rate of only 32.5 percent among the study respondents. This study further reports a higher vaccine hesitancy among men (unlike, say, Abedin et al., 2021), aged over 60 years, and those who have the perception that the efficacy of vaccines is low. M. B. Hossain et al. (2021) report a higher hesitancy rate of 41.1 percent among the study participants. One should bear in mind that these studies come from different study populations using different sampling methods and study tools (for example, how vaccine hesitancy is operationalized in each study). Nasir et al. (2021) study health care professionals and finds a high level of knowledge around the efficacy and safety of COVID-19 vaccines, with 29 percent of the respondents reporting hesitancy towards the vaccines because of safety reasons. On the other hand, Alam et al. (2021) report a vaccine acceptance rate that is lower than 50 percent among the health care professionals they study. Overall, a high vaccine acceptance rate emerges from the studies carried out so far, mirroring the prior success in immunization in Bangladesh.

Except for a couple of studies, most studies implicitly assume that the vaccines will be freely distributed and do not explore the role of prices in the willingness to be vaccinated. Kabir et al. (2021) consider the willingness-to-pay (WTP) for COVID-19 vaccines and find that about 68 percent of respondents are willing to pay for an effective vaccine, with an average WTP of about USD $7. On the other hand, Abedin et al. (2021) find a much lower value; only about 46.5 percent of the respondents are willing to accept the vaccines at a price of USD $1.2. Vaccine hesitancy and the WTP are also associated with different types of perceptions respondents are privy to. Generally, perceived efficacy and safety are strong determinants of vaccine hesitancy (M. B. Hossain et al., 2021; M. S. Islam et al., 2021).Vaccine hesitancy is much higher among respondents who have a concern regarding whether the vaccines are "halal"or not (Kabir et al., 2021). Religious beliefs and norms, as well as misinformation from different channels of media, are also found to be strongly associated with attitudes and perceptions regarding vaccines, a finding which has strongpublic policy implications (Arefin, Hossain, and Rahman, 2021).

We conclude by commenting on actual vaccine uptake and deployment in Bangladesh based on some ongoing work. The intercountry inequality in vaccination rate is a widely discussed topic, and low and low-middle-income countries have lower vaccination rates compared to higher-income counterparts (Ritchie et al., 2021). At the time this article was written, about six million people (3.7 percent of the population) in Bangladesh had received vaccinations, including 4.3 million who received full two doses (2.6 percent of the population). Preliminary findings from a nationally representative phone survey reveal men, members from higher-income households, and higher education are robust predictors of vaccine uptake (JPGSPH, 2021). These preliminary findings suggest socio-economic privilege determined access to vaccines and deliberate policy interventions and community engagements are required to ensure more equitable distribution of COVID-19 vaccines.

Mental Health

Mental health and psychological well-being can be surrogates for subjective "welfare" and have received considerable attention among researchers from different social science disciplines during the COVID-19 pandemic. The cross-sectional nature of the studies also limits ascertaining the causal effect of the pandemic on mental health outcomes [a notable exception is Hamadani et al. (2020), who took advantage of pre-pandemic data on mental health outcomes from an ongoing research project]. Kar et al. (2021) aimed to circumvent this problem by collecting data on suicides reported in newspapers in Bangladesh and India. They find a much higher level of reported suicides during the post-pandemic period compared with pre-pandemic times. Mallik and Radwan (2021) use a recall method within a cross-sectional study to measure the prevalence of predictive psychiatric disorders for a cohort of children and adolescents. They find a two to three times increase in psychiatric disorders during the pandemic compared to the pre-pandemic period. However, such before and after analyses are not common. We restrict ourselves to studies that attempted to link pandemic related fear and perceptions with mental health outcomes.

In terms of mental health outcomes, the reviewed literature has primarily focused on depression, using tools such as a nine-item Patient Health Questionnaire (M. Khan et al., 2021; Sakib et al., 2021), anxiety using a seven-item Generalized Anxiety Disorder tool (M. Khan et al., 2021; Sultana, Khan, Hossain, and Hasan, 2021) along with stress using the Depression Anxiety and Stress Scale 21 (S. R. Chowdhury et al., 2021), and sleep quality with the Pittsburgh Sleep Quality Index (Ahmed et al., 2021; Zubayer et al., 2020). Researchers have also used specialized tools for specific populations, such as the 15-item Geriatric Depression Scale for the elderly (Mistry et al., 2021a).

It is important to recognize the vastness of the literature that has already been developed to understand mental health outcomes and well-being during the COVID-19 pandemic, and what roles the fear of infection has played in worsening the subjective well-being of the studied populations. Health care professionals are particularly vulnerable to COVID-19 infections and Sakib et al. (2021) find that health care professionals dealing with patients with flu-like symptoms suffer from a higher level of COVID-related fear, restlessness, and depression. Not surprisingly, nurses having access to personal protective equipment report lower levels of stress, anxiety, and depression (S. R. Chowdhury et al., 2021).

Al Mamun, Gozal, Hosen, Misti, and Mamun (2021) find a fear of COVID, measured using a scale, and the presence of comorbidity are associated with insomnia and sleeping disorders. Their large sample with over 10,000 respondents allows the geographical mapping of outcomes by different districts in Bangladesh and find district associations with fear and insomnia. Both Al Mamun et al. (2021) and Ara, Rahman, Hossain, and Ahmed (2020) find that women are more likely to report insomnia and sleeping disorders. Women typically report worse mental health outcomes, suggesting a distinct gendered feature of the pandemic, which has both research and policy implications.

Sakib et al. (2021) find depression and fear of COVID are higher among female health care professionals, and M. Rahman, Zubayer, Bhuiyan, Jobe, and Khan (2021) find a higher suicide risk among female respondents. A multi-country review by Marzo et al. (2021), which includes Bangladesh, find higher odds of psychological distress for female respondents.

Several studies have explored COVID-19 symptoms and mental health. Zubayer et al. (2020) show that having COVID-19 related symptoms (with or without actual diagnoses) is associated with a higher level of stress, anxiety, and depression. Sultana et al. (2021) find not only a higher level of anxiety and depression among students with suspected COVID-19 symptoms, but also suicide ideation or "feeling better off dying" among them. The fear of COVID-19 and worsening mental health can further be compounded by having family members and acquaintances with COVID-19 symptoms and diagnoses (A. Khan et al., 2021; Zubayer et al., 2020). A few studies have also explored respondents' perceptions regarding the capacity of the health care sector dealing with COVID-19. Banna et al. (2020) have found the uncertainty regarding the health system's capacity to address COVID-19 infection and care can lead to worse mental health outcomes. Mistry et al. (2021b) have also found a similar association among Rohingya refugees – their psychological well-being worsened when they perceived difficulties in accessing medical care and medicine. Studies such as Abir et al. (2021) and Mistry et al. (2021a) have also shown positive associations between detrimental mental health outcomes and social isolation, quarantine, and loneliness.

Next, we focus on education and economic uncertainty. Bangladesh has maintained one of the strictest closures of education institutes which have postponed in-person classes since the pandemic broke out in March 2020 (ADB, 2021). As such, Mondal, Khan, Ali, Ahamed, and Ahmed (2021) find the majority of the respondents facing severe problems with education-related activities leading to worse quality of life. A. Khan et al. (2021) find increased depression and anxiety among students who are more worried about delays in their academic lives. Hamadani et al. (2020), the only study with real-time before and after within-subject analyses, report a higher level of food insecurity during the pandemic compared to before. Sultana et al. (2020) find a positive association between financial hardship, inadequate food supply, and anxiety and depressive symptoms. Studies have also found higher-income poverty (Hamadani et al., 2020) and lower family income (M. Islam, Islam, Mosaddek, Potenza, and Pardhan, 2021) during the pandemic, leading to worsening mental health outcomes. M. Khan et al. (2021) have documented higher levels of stress and depression associated with being unemployed among young men in Bangladesh.

While the pandemic can worsen mental health through a number of channels (exposure, illness, isolation as well as food insecurity and career and financial uncertainties), some studies have also identified some heterogeneous effects that can guide on how to build psychological resilience during the ongoing pandemic which does not have an immediate end in sight. Ahmed et al. (2021) have grouped study participants according to their adaptiveness based on Big-5 personality traits. The findings show lesser perceived stress among the individuals who are more adaptive compared to lesser or maladaptive individuals. If these traits are malleable and plastic, investing in such adaptive capacities through awareness, education interventions, and counseling can help the vulnerable individuals to better cope with the pandemic and maintain a positive outlook during trying times.

Conclusion

The first COVID-19 case was found on March 8, 2020, in Bangladesh. The pandemic and the lockdowns discussed in this paper affected many aspects of people's lives, and this paper has discussed the evidence on resulting social and economic outcomes. It has compiled the findings of studies from different sources such as research articles, working papers, policy papers, and newspaper articles. Its purpose was to understand the current situation from the evidence, and to provide information that helps manage policy interventions

We find that both international and domestic migration data has been able to predict the risk and spread of the disease effectively. This identification of vulnerable areas may help design efficient contagion policies. The lockdowns and mobility restrictions have affected overall production, trade, and employment. A large share of the manufacturing industry faces a huge loss in their sales, revenue, and exports. Research cited above have shown us it is crucial to concentrate not only on how to increase demand in developed countries but also on managing supply chains.

Studies highlighted that micro and small enterprises experienced a significant reduction in revenue, with a disproportionate number of female workers losing their jobs. Smaller firms in peri-urban areas were more affected.

There is a policy need to prioritize the firms according to their vulnerability and take measures to manage risks and vulnerability of both firms and their employees.

The COVID-19 pandemic also generated food insecurity among people, particularly among day laborers, who are the most susceptible group as they could not go out looking for jobs, nor did these jobs always exist because of nationwide lockdown and reduced economic activity. Targeting vulnerable groups and managing the distribution of government packages would be necessary steps to combat widespread food insecurity.

Providing information is found to be effective in controlling the misconceptions and building trust among the society if it comes from the community and religious leaders. Wearing masks prevent the spread of increases if monitoring or patrolling is involved when someone is found without a mask.

The impact on education is inevitable due to one and half years of school closure. The learning absence for the students is not temporary; rather, it will carry on to a loss in skills for the future workforce. Children, especially the girls, suffered the most and were also sometimes victims of child marriage and school dropout. This warrants a targeted policy for better monitoring and surveillance of incidences of child marriage in rural areas.

The hope for being vaccinated was very low initially because of the low supply and high cost of the vaccines in Bangladesh. Moreover, the willingness to pay for the vaccine is very low as most people do not understand the positive effects on society if they are vaccinated. However, studies suggest that vaccination will not be a problem if the government ensures a sufficient supply of the vaccine and if it continues to be free.

The government of Bangladesh has been taking several measures to combat the pandemic. The policy measures target small and large firms, industries, different occupations, vulnerable groups, and other associated parties. However, due to the sudden outbreak of the disease, the government had to take instant measures to stop spreading the disease. This study compiles the impact of many of the measures taken by the government and helps compare them to assist future policies. It also directs the reader to the issues and concerns that may appear in the future due to the pandemic. Therefore, the study contributes to the literature by examining the current pandemic in a manner that may be helpful to design and manage future pandemics.

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