

# COVID-19 in Bangladesh: Prevalence, KAP and Heterogeneous Shocks under 'General Holiday' - An Exploratory Study Based on an Online Survey

## Abstract

This study is based on data generated online which covered all socio-economic groups and all districts of the country. It can be considered representative of the vast online population, and it is believed that the patterns exposed would find strong resonance in the wider population as well. The survey was conducted during the period of the 'general holiday' in Bangladesh which is euphemistically a reference to lockdown. It estimates that 10 percent of the population displayed COVID-19 type symptoms and 1 percent had comorbidities. We also noted that urban residents, divorcees, and members belonging to large households faced greater risk while higher incomes usually corresponded with reduced risk. Shocks to income were substantial, with nearly 50 percent reporting income flows halted for younger age groups while this was about a third for older groups. In terms of coping ability this was seen to be weak. We also noted that there was considerable awareness of good practices like handwashing and social distancing. While ordinary people tried hard to fight back, their means were limited, indicating that for a poor country, a longer-term lockdown would be untenable.

## I Introduction

### Prevalence

Bangladesh reported the first confirmed COVID-19 case on March 08, 2020, and ever since, the number of cases and the death count have been increasing steadily (WHO, 2020b). As of mid-October, there were over 384, 559 confirmed cases and 5,608 deaths although there is a general view that inadequate testing has resulted in serious under-reporting of both (Anwar, Nasrullah, & Hosen, 2020; GOB, 2020; IEDCR, 2020). As coronavirus is most infectious during its early stages, it is important to screen people on the basis of COVID-type symptoms on a regular basis, to decide who to test, quarantine or follow up, especially given serious testing capacity constraints (Gostic, Gomez, Mummah, Kucharski & Lloyd-Smith, 2020; Wölfel, Corman, Guggemos, Seilmaier, Zange, Muller & Wendtner, 2020). However, research indicates that around half of the infected people remain unscreened as they are asymptomatic (Gostic, Gomez, Mummah, Kucharski & Lloyd-Smith, 2020). Thus, existing information that is available, appears to be grossly inadequate in representing the prevalence and extent of the spread of COVID-19 in Bangladesh.

Following the sharp rise in COVID-19 cases, the government announced a lockdown billed officially as a 'general holiday' (citing absence of a legal framework that would allow a lockdown to be imposed short of declaring a state of emergency). During this time, the economy slowed down in the face of closure of public and private offices, businesses and factories. At the same time, the government urged people to stay at home, wash hands frequently, wear masks and practice social distancing. However, these measures were not uniformly enforced across the country leading to what at best could be described as

a soft lockdown. However, whether people strictly observed quarantine measures or not, the economy did come to a near halt. Essential businesses continued to operate, mainly in the food and medicine sector although there was a quick movement of retail services onto online platforms. Online businesses appeared to thrive - in particular, those related to supply of masks, disinfectants, hand sanitizers, PPE, pulse-oxymeters, and so on, in addition to food and other essentials. These businesses may have targeted urban, middle class households.

At some point, the powerful owners of ready-made garments factories began intense lobbying of the government so that they are allowed to reopen their factories – a demand to which the government conceded. There were instances of mixed signals sent out to workers who by this time had returned to their villages to wait out the COVID storm. These mixed signals resulted in large numbers of workers moving back and forth from their village homes to their workplaces in towns, unleashing fears of uncontrolled spread of the virus Hossain (2020). Similar large-scale movement of people occurred during the two Islamic festivals of Eid in the months of May and August 2020, once again causing consternation amongst public health experts (Tajmin, 2020). In other words, the lockdown was loosely administered, and soon, a large number of ‘exemptions’ were granted, further diluting whatever efficacy it might have had.

#### Socio-Economic Shocks

The socio-economic impacts of the lockdown can be profound for developing countries like Bangladesh. Some recent estimates revealed that four out of five of the 'new poor' created by the COVID-19 pandemic would be living in Sub-Saharan Africa and South Asia (Sumner, Hoy & Ortiz-Juarez 2020) and a quarter of a billion people could be facing starvation (UN, 2020). There is also the matter of the tradeoff between economic welfare and personal health which has generated much debate (Ravallion, 2020). This tradeoff is particularly relevant to groups whose livelihoods are directly affected by lockdown and travel restrictions.

A recent study found that income of Bangladeshi workers involved in informal occupations like day laborers, restaurant workers, maids, factory workers, rickshaw pullers, declined sharply during the lockdown period (Rahman, Das, Matin, Wazed, Ahmed, Jahan & Umama, 2020). Another study found that 9 out of 10 households experienced some degree of negative shock on incomes during the lockdown, possibly resulting in lower food intakes (Ahmed, Pakrashi, Rahman, Siddique, 2020). Considering the fact that around 85 percent of the workforce is employed in the informal sector, the welfare consequences of the lockdown could be enormous (Mujeri 2018).

#### Knowledge, Attitude and Practices

To reduce the spread of Coronavirus and to control the pandemic, the World Health Organization periodically updates its guidelines and health advisory to the public. The principal guidance emanating from WHO are as follows:

- a) To wash hand with soap or alcohol-based hand-sanitizer,
- b) To maintain a minimum distance of 1 meter (3 feet) - subsequently increased to 2 meters (6 feet) from another person,

- c) To wear a mask in public
- d) To maintain self-isolation if one has minor symptoms such as cough, headache, mild fever.

The use of face masks in public significantly reduces the infection rate (Lyu, 2020). A systematic review by (Chu, 2020) found that maintaining 1 meter or 3 feet distance from others is vital to reduce transmission, while frequently washing hands prevents the spread of respiratory viruses (Jefferson, 2011). Adoption of these practices is crucial to lowering the risk of infection. Therefore, in order to achieve the desired control of COVID-19, people's adherence to these control measures are essential, which is largely affected by their knowledge, attitudes, and practices (KAP).

#### Domestic Violence

Another growing concern that is being increasingly raised in the context of COVID-19 is the effect that it appears to be having on domestic violence, especially during lockdowns - i.e. in conditions when people are forced to be confined indoors for prolonged periods (Leslie & Wilson, 2020; Sanga & McCrary, 2020). This has stimulated a growing literature on the impact of COVID on different forms of abuse and violence, including interpersonal violence (IPV), Sexual or Gender Based Violence (SGBV), domestic violence (DV) and self-harm and adverse psychological outcomes.<sup>1</sup> This therefore is another important line of inquiry in the specific context of Bangladesh.

#### Objectives

This study attempts to explore the feasibility of generating large-scale, country-wide data that could enable researchers to generate useful information on the following COVID-19-related aspects. The intention is to assess and explain the extent of spatial and socio-economic distribution of the following outcomes:

1. Prevalence of COVID-19-like symptoms and co-morbidities,
2. The magnitude of socio-economic shocks and ability of people to cope,
3. Adoption of 'knowledge, attitude and practices' that could protect the population,
4. Impact on domestic violence.

Explanatory factors (variables) of interest are individual, household, socio-economic and locational profiles of respondents (see Table 1).

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<sup>1</sup> See, for example Olding et al. (2020) for a study on self-harm and psychotic disorder, Moreiraa and Da Costa (2020) for a literature review of impact on IPV, Bullinger (2020) Pose on DV and Flowe et al.(2020) on impact of economic losses in heightened experience of DV. Another study finds considerable evidence of abuse and DV/IPV under lockdown (Bradley-Jones and Isham 2020).

## Data and Methodology

Netizens of Bangladesh, who had completed the Secondary School Certificate Examination (SSC)<sup>2</sup>, were eligible for the survey with respondents drawn from all 64 administrative districts, over the period 5-29 May 2020.<sup>3</sup> There are around 36 million Facebook users in Bangladesh but at any given period, active numbers are much lower, perhaps as low as 12.5 million.<sup>4</sup>

The survey was advertised widely through Facebook. Given the target sample size of 30,000, the advertisements had to reach over 1.5 million users, as advised by the IT consultant.<sup>5</sup> A total of 30,741 persons responded to our call by filling up the questionnaire, from which 832 observations were dropped due to duplication, leaving a total of 29,909 responses for analysis.

Given the nature of the data generated (cross-sectional, mostly qualitative, category variables), the analytical approach used combined descriptive tools with binary regression models to explore the four objectives outlined. In other words, for each objective, namely prevalence, shocks, adoption of KAP, and domestic violence, the study examined their status, distribution and correlates/associations, and attempted to assess the influence of explanatory variables relating to socio-economic characteristics, coping ability, and spatial and neighbourhood attributes. In the case of the last objective (domestic violence) the purpose was to examine the association with COVID-19, requiring therefore, the inclusion of factors related to the pandemic.

## Econometric Analysis Used: Binary Regression Models (Logit/Logistic and Probit) and Ordered Logit Models<sup>6</sup>

The "logit" model can be represented as follows:

$$\ln[p/(1-p)] = \alpha + BX + e \text{ or}$$

$$[p/(1-p)] = \exp(\alpha + BX + e)$$

where:

- $\ln$  is the natural logarithm,  $\log_{\exp}$ , where  $\exp=2.71828...$
- $p$  is the probability that the event  $Y$  occurs,  $p(Y=1)$

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<sup>2</sup> This exam is held after completion of grade 10 |

<sup>3</sup> The 'General Holiday' began in late March and continued until end June.

<sup>4</sup> This is the number obtained from our IT consultant who was given the task of fielding the survey from the Facebook portal. Other sources e.g. Internet World Stats – see <https://www.internetworldstats.com/stats3.htm>), give much higher figures.

<sup>5</sup> IT services were provided by Dizillion, website: [www.dizillion.com](http://www.dizillion.com)

<sup>6</sup> For the methodology of Ordered Logit we followed Cameron & Trivedi (2005). Considering an index function model:  $y_i^* = x_i\beta + u_i$ , where,  $y_i^*$  is an outcome determining single latent variable and  $u_i$  is the error term. For  $m$  alternative ordered model, it follows that  $y_i = j$  if  $\alpha_{j-1} < y_i^* < \alpha_j$ , where,  $\alpha_0 = -\infty$  and  $\alpha_m = \infty$ .

- $p/(1-p)$  is the "odds ratio"
- $\ln[p/(1-p)]$  is the log odds ratio, or "logit"
- $X$  are the explanatory variables and  $B$  are the coefficients of  $X$ .

The logistic regression model is simply a non-linear transformation of the linear regression. The "logistic" distribution is an S-shaped distribution function which is similar to the standard-normal distribution (which results in a probit regression model) but easier to work with in most applications (the probabilities are easier to calculate). The logit distribution constrains the estimated probabilities to lie between 0 and 1.

In this study, the authors preferred to employ the logistic model to explore the first three objectives (prevalence, shocks and adoption of KAP) and probit models to analyze domestic violence.

#### Basic Sample Characteristics

The socio-economic and demographic data collected include; age in years, marital status, gender, education level, household size, household income, administrative divisions, location of household (e.g. village, small town, big town, City Corporation), etc.

The employment status of the respondents during COVID-19 pandemic situation was also captured. In light of earlier studies, the relevant behavioural factors (social distancing, using hand sanitizer, mask, hand wash, go out of the house, etc.) as well as information on associated COVID-19 symptoms and co-morbidities, were also captured in the survey (Giannouchos, Sussman, Mier, Poulas & Farsalinos 2020; Wei, Wang, Zhang, Tu, Chen, Ji & Fei, 2020).

Table 1 presents the background information of the study participants. Most of the study participants were aged were between 31-49 years (71.3percent). The majority were male (66percent), married (77.54percent), had tertiary education (65percent), were employed (60percent), and engaged in private-sector salaried work (48percent). The participants were from all administrative divisions of Bangladesh although an absolute majority were from Dhaka and Chattagram divisions (52percent). Around 56percent of the respondents lived in relatively big towns and city corporation areas, while 59percent lived in families with four to six members. During the COVID-19 pandemic situation, more than half of the respondents (53percent) worked from home.

Generally, one can say that the sample represents a younger, more urban and more affluent demographic even though all socio-economic groups are represented.

Table 1: Background characteristic of study participant, (N=29,909)

Variables	N	percent
<i>Age of respondents</i>		
Less than 19 years old	806	2.69
19-30	5,786	19.35
31-49	21,340	71.35
50-59	1,848	6.18
60 and above	129	0.43

Sex		
Male	19,764	66.08
Female	10,145	33.92
<i>Marital status</i>		
Currently married	23,192	77.54
Currently unmarried	6,438	21.53
Divorced	109	0.36
Separated	107	0.36
Widowed	63	0.21
<i>Division</i>		
Barishal	2,143	7.17
Chattogram	8,144	27.23
Dhaka	7,437	24.87
Khulna	5,825	19.48
Mymensingh	445	1.49
Rajshahi	3,672	12.28
Rangpur	1,122	3.75
Sylhet	1,121	3.75
<i>Residence</i>		
Village	7,605	25.43
Small town	5,422	18.13
Big town	9,014	30.14
City corporation	7,868	26.31
<i>Education</i>		
SSC	5,316	17.77
HSC	3,899	13.04
Diploma	1,193	3.99
Degree	3,472	11.61
Honors	3,250	10.87
Masters	12,779	42.73
<i>Employment history</i>		
Unemployed due to corona	3,768	12.60
Housewife	1,134	3.79
Student	2,070	6.92
Employed	17,732	59.29
Unemployed seeking job	5,205	17.4
<i>Type of employed (n=17,732)</i>		
Freelancing	348	1.96
Daily contractual	613	3.46
Monthly salaried	14,599	82.33
Self-employed	2,172	12.25
<i>Type of employer (n=17,732)</i>		
Public	3716	20.96
Private	8470	47.77
Autonomous	1,734	9.78
NGO	1,450	8.18
Other	2362	13.32
<i>Work place during corona situation (n=17,732)</i>		
Office	8,410	47.43
At home	9,322	52.57
<i>Income level of the respondents (n=17,732)</i>		
Less than 5000	754	4.25
5000-15000	4,238	23.9
15001-30000	6,705	37.81
30001-50000	3,695	20.84
50001-100000	1,876	10.58
More than 100000	464	2.62

Household size		
Less than 4	6,354	21.24
4-6	17,553	58.69
More than 6	6,002	20.07
Monthly household income		
Less than 11000	7,217	24.13
11001-20000	7,693	25.72
20001-30000	5,837	19.52
30001-50000	5,050	16.88
50001-100000	3,061	10.23
100000+	1,051	3.51
<i>Social distance</i>		
A little	1,276	4.27
Not at all	1,390	4.65
Almost completely	9,424	31.51
Moderately	8,389	28.05
Completely	9,430	31.53
<i>Wearing a mask outside home</i>		
Never	44	0.15
Rarely	105	0.35
Sometimes	1,539	5.15
Always	28,221	94.36
<i>Use of hand gloves outside home</i>		
Never	6,308	21.09
Rarely	2,484	8.31
Sometimes	11,050	36.95
Always	10,067	33.66
<i>How many times do you wash in a day?</i>		
Less than 4	7,956	26.6
4-6	14,409	48.18
More than 6	7,544	25.22
<i>Do you use hand sanitizer/hand rub?</i>		
No	5,020	16.78
Yes	24,889	83.22
<i>How many times do you go to outside the home?</i>		
Not at all	2,128	7.11
Once a day	13,796	46.13
Once twice a week	9,850	32.93
Once a week	4,135	13.83
<i>Did you get sick in the last month?</i>		
No	26,817	89.66
Yes	3,092	10.34
<i>Does anyone in your family have symptoms of the corona-virus?</i>		
No	29,230	97.73
Yes	679	2.27
<i>Disease symptoms</i>		
At-least two symptoms of COVID19	2,192	7.33
Three or more symptoms of COVID19	776	2.59
Single disease as risk factor for COVID19	181	0.61
Two or more diseases as risk factors for COVID19	169	0.57

## II Prevalence of COVID-19-like Symptoms and Comorbidities

There are four outcome variables that were used for this component, related to prevalence of COVID-like symptoms and incidence of comorbidities.<sup>7</sup> Thus, the dependent variable for Model I is “risk factors for COVID with dual symptoms” and for Model II, “risk factors for COVID with 3 or more symptoms”. Models 3 and 4 incorporated, in addition to symptoms, 1 or more comorbidity(ies) reported (Table 2).

### Symptoms

Multivariate logistic regression models were used to explore the association between the outcome variables and independent variables. The outcome variables are specified as binary variables taking on a value of 1 when respondents report two COVID-like symptoms and 0, otherwise (Model I). In Model II, the outcome variable takes on a value of 1 when respondents report three or more symptoms, 0 otherwise. Diagnostic tests were employed in the analysis. The variance inflation factor (VIF) test was employed to detect multicollinearity in the regression model.

The survey captured the illness history of the respondents preceding one month from the period of the survey. All information collected during the survey was self-reported. We found that 10.34percent of respondents suffered from some type of illness during the reference period while 7.34percent of respondents reported that they had at least two symptoms of COVID-19 (e.g., fever, dry cough, lost sense of smell, diarrhoea, wet cough, headache, tiredness, breathing problem). Further, 2.6percent respondents reported displaying three or more COVID-like symptoms. Survey respondents also reported that 2.27percent of family members displayed COVID-19 type symptoms whereas 0.61percent had a single comorbidity (e.g., asthma, blood pressure, diabetes, heart disease, lung disease, kidney disease, liver disease) and 0.57percent had two or more comorbidities, making them especially vulnerable.

The study also obtained information related to precautionary measures adopted by study participants. Over 30percent reported practicing social distance completely, and nearly 95percent reported using masks when going out. Around 34percent of respondents used hand gloves regularly while 37percent reported they used gloves sometimes. We found that about 83percent of respondents used hand sanitizer/hand rub whereas approximately 73percent of respondents reported they washed their hand at least 4 times in a day (Table 1).

Table 2 reports the results of the multivariate logistic regression models for risk factors associated with dual (Model I) and 3 or more symptoms (Model II). A number of interesting results were found, as shown below:

### Model I

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<sup>7</sup> See World Health Organization (WHO, 2020a).



It was found that widowed, divorced and unmarried individuals had a higher risk of being symptomatic. It was also found that those who were living in small towns were less likely to display COVID-19 symptoms compared to those living in villages.

Those with a higher secondary level education (HSC) seem to be at greater risk compared to those with a SSC qualification. Further, household members with incomes ranging from BDT 11,000-50,000 were found to be at lower risk of COVID-19 compared to poor households earning less than BDT 11000.

It was also seen that larger households, especially those with more than 6 members, were more prone to COVID-19. On the other hand, Individuals who used hand gloves, sanitizer/hand rubs, and who rarely went outside of their homes were significantly much less likely to develop COVID-19 symptoms compared to those who ignored these advice.

#### Model II

As with Model I, those aged 19-30 and 31-49 were found to be at higher risk, compared to the reference group (less than 19 years old)<sup>8</sup>. Similarly, unmarried respondents at the time of the survey, were found to have more odds (OR: 1.73; p-value: <0.001) compared to their married counterparts.

People living in big towns or City Corporation areas were more likely to be exposed to COVID-19 infections (Big town: OR: 1.44, p-value: <0.001; City corporation: OR: 1.67, p-value: <0.001) compared to the people who live in village areas. The findings of this study also show that HSC or Diploma holders had higher OR compared to SSC educated respondents.<sup>9</sup> Also, as before, household sizes matter - those with six members or more were more prone to COVID19 infections (OR: 1.27, p-value: <0.05) compared to smaller households.

The study also observed a negative relationship between social distance and COVID-19 symptoms, and this is statistically significant. The risk of COVID19 was also significantly lower for those who used hand gloves, sanitizer/hand rub and remained at home. The positive association between COVID19 symptoms and handwashing are also indicative of more frequent hand sanitization of those exposed – a finding that is reassuring.

Both models yielded very similar results, except perhaps, for the case relating to place of residence. Intuitively, this finding seems more plausible since the primary source of infection have been the big cities rather than villages. The Model I result that small towns were at lower risk compared to villages, makes less sense.

#### Comorbidities

The comorbidities, suspected COVID-19 cases, and associated risk factors are examined through multivariate logistic analysis and reported in table 3. Model III shows the risk factors associated with

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<sup>8</sup> The Odds Ratio (OR) were 2.09 and 2.01, significant at p-value: <0.10

<sup>9</sup> HSC: OR: 1.43, p-value: 0.01; Diploma: OR: 1.54, p-value: <0.05.

single comorbidity of suspected COVID-19 cases, while Model IV shows the risk factors for dual morbidity in suspected COVID-19 cases.

The main findings are presented below:

### Model III

Divorced individuals were found to be at much higher risk due to comorbidity compared to the reference group (currently married). Further, higher income households were relatively less prone to COVID-related mortality than the reference low-income household, as they had fewer comorbidities. In addition, it was found that individuals living in larger households (4 to 6 members) were also in higher risk as they had 1.61 times higher risk of comorbidity than small households which may be taking a heavy toll during COVID-19 pandemic.

### Model IV

The results show that unmarried and widowed individuals were at relatively high risk of mortality as they had multiple comorbidities (e.g., asthma, blood pressure, diabetes, heart disease, lung disease, kidney disease, liver disease) during COVID-19 infections.

Findings also reveal that comparatively better educated people were more likely to die of COVID with associated comorbidities compared to less educated people. In addition, it was found that high-income families were less prone to death as they had fewer comorbidities than low-income households. However, larger households were found to be at greater risk of COVID-related deaths as they had multiple comorbidities along with COVID-19 symptoms.

It may be noted that although many household members reported suffering from multiple diseases, they often ignored social-distancing measures as well as failing to wear masks and gloves. Indeed, respondents who adopted handwashing and sanitizer/hand rub were more likely to quarantine themselves when they suspected exposure to potential infection.

In summary, the findings in this section suggest that about 10% of responded and 2.27% of their household members were suspected COVID-19 patients whereas about 1% had comorbidities, making them especially vulnerable. The study indicated that people living in big cities were more likely to be exposed to COVID-19 infections. The study focused on several factors that can better define those COVID-19 patients at higher risk, and thus allow a more targeted and specific approach to prevent those deaths through appropriate preventive measures.

Table 2: Risk factors for COVID-19 considering single or more symptoms

Factors variables	Model I		Model II	
	Risk factors for COVID with at-least dual		Risk factors for COVID with three or more	
	Adj. OR	95% CI	Adj. OR	95% CI
<b>Aged of respondents</b>				
Less than 19 years old (ref)				
19-30	0.90	(0.68 , 1.20)	2.09*	(1.12 , 3.88)
31-49	0.83	(0.62 , 1.10)	2.01*	(1.08 , 3.77)

50-59	0.71*	(0.51, 1.00)	0.79	(0.36, 1.71)
60 and above	1.28	(0.70, 2.35)	2.10	(0.59, 7.52)
<b>Sex</b>				
Male (ref)				
Female	1.07	(0.97, 1.19)	1.15	(0.97, 1.37)
<b>Marital status</b>				
Currently married (ref)				
Currently unmarried	1.19***	(1.06, 1.34)	1.73***	(1.45, 2.07)
Divorced	2.34***	(1.35, 4.05)	1.11	(0.36, 3.45)
Separated	1.49	(0.76, 2.91)	1.61	(0.51, 5.04)
Widowed	4.81***	(2.65, 8.74)	-	-
<b>Division</b>				
Barishal (ref)				
Chattogram	1.06	(0.88, 1.27)	1.13	(0.83, 1.55)
Dhaka	0.98	(0.81, 1.19)	1.05	(0.76, 1.45)
Khulna	0.94	(0.77, 1.15)	1.02	(0.73, 1.44)
Mymensingh	0.83	(0.55, 1.25)	1.40	(0.79, 2.51)
Rajshahi	0.85	(0.69, 1.05)	0.95	(0.66, 1.37)
Rangpur	1.14	(0.87, 1.49)	0.86	(0.52, 1.40)
Sylhet	0.76	(0.56, 1.02)	0.92	(0.57, 1.50)
<b>Residence</b>				
Village (ref)				
Small town	0.80***	(0.70, 0.92)	1.19	(0.94, 1.50)
Big town	0.95	(0.84, 1.08)	1.44***	(1.17, 1.78)
City corporation	1.00	(0.87, 1.13)	1.67***	(1.34, 2.07)
<b>Education</b>				
SSC (ref)				
HSC	1.27***	(1.09, 1.49)	1.43**	(1.11, 1.85)
Diploma	0.86	(0.66, 1.13)	1.54*	(1.06, 2.23)
Degree	0.96	(0.80, 1.14)	0.80	(0.58, 1.11)
Honors	0.96	(0.80, 1.15)	1.04	(0.77, 1.41)
Masters	1.07	(0.93, 1.23)	1.22	(0.97, 1.54)
<b>Monthly household income</b>				
Less than 11000 (ref)				
11001-20000	0.77*	(0.6, 0.99)	1.19	(0.73, 1.95)
20001-30000	0.76*	(0.59, 0.98)	1.31	(0.81, 2.12)
30001-50000	0.71**	(0.55, 0.92)	1.18	(0.72, 1.92)
50001-100000	0.80	(0.62, 1.02)	1.31	(0.81, 2.12)
100000+	0.96	(0.74, 1.24)	1.40	(0.85, 2.29)
<b>Household size</b>				
Less than 4 (ref)				
4-6	1.15*	(1.02, 1.29)	1.01	(0.84, 1.22)
More than 6	1.24***	(1.07, 1.43)	1.27*	(1.02, 1.59)
<b>Maintain social distance</b>				
A little (ref)				
Not at all	0.97	(0.72, 1.32)	0.56**	(0.37, 0.87)
Almost completely	1.21	(0.96, 1.53)	0.57***	(0.42, 0.76)
Moderately	1.29*	(1.03, 1.62)	0.65***	(0.49, 0.87)
Completely	1.01	(0.79, 1.28)	0.45***	(0.33, 0.62)
<b>Wearing a mask outside home</b>				
Never (ref)				
Rarely	0.85	(0.29, 2.48)	1.43	(0.6, 3.43)
Sometimes	0.73	(0.31, 1.76)	0.74	(0.54, 1.01)
Always	0.65	(0.27, 1.55)	-	-
<b>Use of hand gloves outside home</b>				
Never (ref)				
Rarely	0.83*	(0.69, 0.98)	1.11	(0.87, 1.41)
Sometimes	0.95	(0.84, 1.07)	0.66***	(0.55, 0.8)
Always	0.67***	(0.58, 0.76)	0.62***	(0.51, 0.77)

<b>How many times do you wash in a day?</b>				
Less than 4 (ref)				
4-6	1.02	(0.92, 1.14)	1.29**	(1.07, 1.55)
More than 6	1.03	(0.91, 1.17)	1.29*	(1.04, 1.59)
<b>Do you use hand sanitizer/hand rub?</b>				
No (ref)				
Yes	0.88*	(0.78, 0.99)	0.69***	(0.58, 0.82)
<b>How many times do you go to outside the home?</b>				
Not at all (ref)				
Once a day	1.05	(0.87, 1.26)	0.82	(0.62, 1.08)
Once or twice a week	0.82*	(0.68, 0.99)	0.58***	(0.43, 0.77)
Once a week	0.85	(0.69, 1.05)	0.61***	(0.44, 0.85)
Constant	0.19***	(0.07, 0.5)	0.02***	(0.01, 0.05)
N	29,133		27631	
Wald chi2	265		321.46	
Prob > chi2	<0.001		<0.001	
Pseudo R2	0.02		0.04	
Log likelihood	-7,645		-3394.94	

Note: \*P-value: 0.05; \*\*P-value: 0.01; \*\*\*P-value: <0.001

Table 3: Risk factors for COVID19 by comorbidity

Factors variables	Model III		Model IV	
	Risk factors for COVID with single disease		Risk factors for COVID with two or more diseases	
	Adj. OR	95percent CI	Adj. OR	95percent CI
<b>Age of respondents</b>				
Less than 19 years old (ref)				
19-30	0.84	(0.31, 2.30)	0.19*	(0.04, 1.03)
31-49	0.91	(0.33, 2.48)	0.22	(0.04, 1.16)
50-59	0.28	(0.06, 1.24)	0.13*	(0.02, 0.77)
60 and above	3.02	(0.55, 16.46)	-	-
<b>Sex</b>				
Male (ref)				
Female	0.99	(0.69, 1.41)	1.07	(0.74, 1.55)
<b>Marital status</b>				
Currently married (ref)				
Currently unmarried	1.17	(0.77, 1.77)	1.96***	(1.31, 2.93)
Divorced	8.58***	(3.05, 24.13)	-	-
Separated	-	-	-	-
Widowed	-	-	16.74***	(4.09, 68.53)
<b>Division</b>				
Barishal (ref)				
Chattogram	1.20	(0.60, 2.39)	0.75	(0.40, 1.4)
Dhaka	1.32	(0.65, 2.70)	0.99	(0.53, 1.86)
Khulna	1.41	(0.67, 2.96)	1.02	(0.53, 1.96)
Mymensingh	2.02	(0.67, 6.08)	1.24	(0.40, 3.85)
Rajshahi	1.44	(0.67, 3.12)	0.85	(0.42, 1.71)
Rangpur	1.66	(0.66, 4.16)	0.50	(0.16, 1.54)
Sylhet	0.89	(0.30, 2.63)	0.41	(0.12, 1.44)
<b>Residence</b>				
Village (ref)				
Small town	1.52	(0.96, 2.4)	0.88	(0.55, 1.41)
Big town	0.83	(0.52, 1.31)	1.23	(0.82, 1.84)
City corporation	1.42	(0.93, 2.17)	1.12	(0.71, 1.76)
<b>Education</b>				
SSC (ref)				

HSC	0.75	(0.41, 1.34)	1.71	(0.92, 3.16)
Diploma	-	-	2.82**	(1.31, 6.05)
Degree	0.64	(0.33, 1.21)	2.78***	(1.54, 5.04)
Honors	0.93	(0.51, 1.71)	0.84	(0.37, 1.90)
Masters	1.31	(0.85, 2.02)	1.89*	(1.07, 3.34)
<b>Monthly household income</b>				
Less than 11000 (ref)				
11001-20000	1.14	(0.79, 1.65)	0.92	(0.62, 1.37)
20001-30000	0.47**	(0.28, 0.8)	0.93	(0.59, 1.48)
30001-50000	0.58*	(0.35, 0.95)	0.63	(0.38, 1.05)
50001-100000	0.72	(0.40, 1.27)	0.39*	(0.18, 0.87)
100000+	-	-	0.41	(0.12, 1.35)
<b>Household size</b>				
Less than 4 (ref)				
4-6	1.61*	(1.07, 2.43)	1.68*	(1.05, 2.69)
More than 6	1.02	(0.59, 1.74)	2.68***	(1.60, 4.52)
<b>Maintain social distance</b>				
A little (ref)				
Not at all	-	-	0.62	(0.27, 1.45)
Almost completely	2.10	(0.89, 4.98)	0.41***	(0.23, 0.72)
Moderately	1.53	(0.65, 3.60)	0.61	(0.35, 1.08)
Completely	1.40	(0.58, 3.38)	0.39***	(0.21, 0.72)
<b>Wearing a mask outside home</b>				
Never (ref)				
Rarely	-	-	-	-
Sometimes	1.18	(0.64, 2.16)	0.43*	(0.19, 0.98)
Always	-	-	-	-
<b>Use of hand gloves outside home</b>				
Never (ref)				
Rarely	0.72	(0.40, 1.28)	1.44	(0.89, 2.33)
Sometimes	0.62*	(0.42, 0.92)	0.63*	(0.42, 0.93)
Always	0.68	(0.43, 1.07)	0.37***	(0.23, 0.58)
<b>How many times do you wash in a day?</b>				
Less than 4 (ref)				
6-Apr	0.95	(0.66, 1.37)	0.90	(0.62, 1.29)
More than 6	0.87	(0.58, 1.31)	0.89	(0.58, 1.37)
<b>Do you use hand sanitizer/hand rub?</b>				
No (ref)				
Yes	1.22	(0.80, 1.87)	2.15**	(1.25, 3.69)
<b>How many times do you go to outside the home?</b>				
Not at all (ref)				
Once a day	1.38	(0.75, 2.56)	3.07	(0.87, 10.89)
Once or twice a week	1.09	(0.56, 2.12)	3.45	(0.97, 12.34)
Once a week	0.53	(0.24, 1.18)	4.38*	(1.20, 16.03)
Constant	0.001***	(0, 0.01)	0.01***	(0.00, 0.04)
N	25,914		28573	
Wald chi2	187.08		286.47	
Prob > chi2	0.00		0.00	
Pseudo R2	0.040		0.070	
Log likelihood	-1,031		-964	

Note: \*P-value: 0.05; \*\*P-value: 0.01; \*\*\*P-value: <0.00

### III Shocks and Coping Ability

A recent survey found that workers involved in informal work as, e.g. day laborers, maids, rickshaw pullers, petty traders, experienced a sharp fall in income due to the lockdown (Rahman, Das, Matin, Wazed, Jahan & Umama, 2020). Since 85 percent of the workforce in the country is engaged in informal employment, the lockdown may have had far-reaching implications for the economy. Another study found that 9 out of 10 households experienced some degree of negative shock in income during the lockdown which is likely to have affected their food intakes (Ahmed, Pakrashi, Rahman & Siddique, 2020).

The impact of the lockdown is not symmetric across socio-economic groups. Effective policymaking during a crisis like the current pandemic necessitates exploring this asymmetry. In this section, we explore shocks and its influence on different socio-economic groups, as well as levels of preparedness of people to meet these contingencies.

Two shock related variables were generated from the survey:

- Impact on monthly income
- Impact on food expenditures

To assess preparedness, data was obtained on the number of days the lockdown could be sustained by a household in terms of household food and resources. The variables were specified in a manner that made these amenable to natural ordering on a scale.

The following ordered logit models were estimated:<sup>10</sup>

Model 1 examines income shocks;

Model 2 examines the ability of households to economically cope under lockdown (i.e. ability to sustain basic household consumption levels).

The regressors include gender, age, marital status, place of residence, level of education, employment status, income, whether there was any death related to coronavirus in the respondent's area, and dummies for different administrative 'Divisions'.

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<sup>10</sup> To observe the coping ability, we also explored models with expected days of food storage depletion, and expected days of depletion of cash available of the respondents' families as dependent variables and witnessed almost identical results as model-2.

## Employment Effects

Figures 1 and 2 give us an overview of the impact of the lockdown on livelihoods. From figure 1 we can see that 13 percent of the respondents became unemployed. The worst affected were the self-employed, followed by freelancers, and daily contract-workers. Around 44 percent of the self-employed and 38 percent of the freelancers reported that their earnings had actually come to a halt. Another 42 percent – mainly from rural areas, reported that their income had substantially reduced (Figure 2).

### Shocks on Income and Expenditure

Extent of impact varies by age - younger people are hit harder. Thus, around half the respondents belonging to the 16-29 year group reported that their incomes had stopped during the lockdown, compared to 32 percent for other groups. Also, urban residents reported greater income losses compared to rural ones, while the relationship with education, as expected was inverse. Better educated respondents tended to be less affected by income losses. As the income sources of the unemployed group are irregular and informal, they faced the biggest income shock. Almost all of them reported either reduction of income or stoppage of income flows. Even for those employed, half reported some negative impacts with those in the lower income groups suffering disproportionately (Table 4). Thus, 80-85 percent of the respondents belonging to the two lowest income strata reported that their income flows stopped or reduced.

Figure 1: Employment status during COVID19

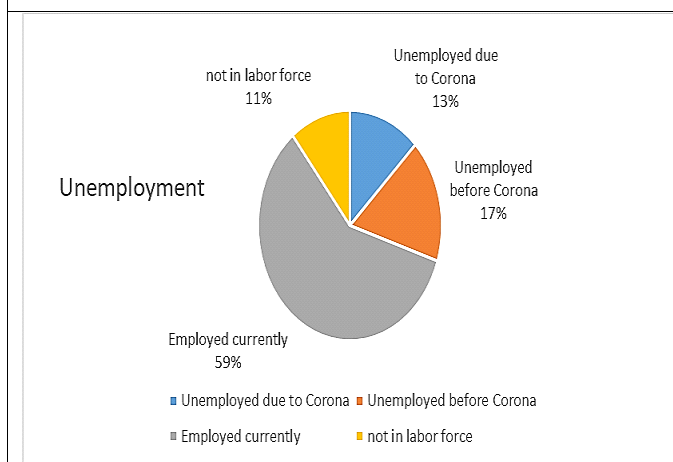


Figure 2: Employment wise change in income in lockdown

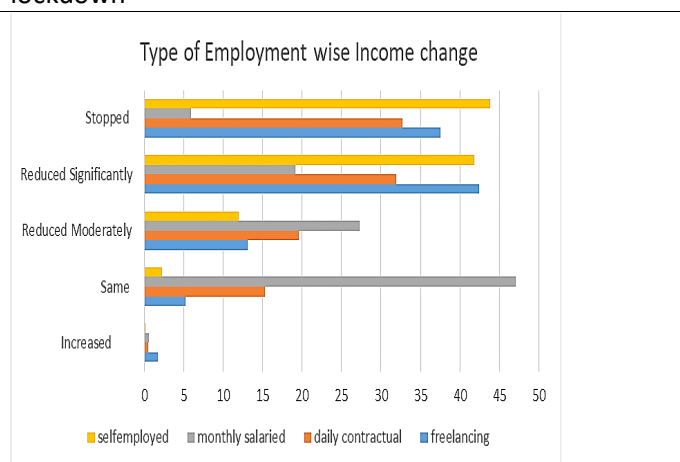


Table 4: Monthly income relative to the pre-lockdown period (percent, row)

	Monthly income relative to the pre-lockdown period			
	Increased/	Reduced	Reduced	Stopped

		Same	Moderately	Significantly	
<b>Age</b>	16-29	18.93	13.1	18.89	48.6
	30-49	27.95	13.37	20.69	32.79
	50+	34.7	15.78	15.69	31.58
<b>Residence</b>	Rural	24.31	11.58	19.73	39.17
	Urban	27.81	18.22	20.31	33.67
<b>Size of households</b>	less than 4	31.64	15.25	19.21	30.87
	4 to 5	25.86	15.42	19.78	36.67
	6 to 8	25.45	14.44	21.28	35.38
	9 or more	24.98	13.48	21.24	36.38
<b>Education</b>	SSC	13.44	12.85	23.53	49.13
	HSC	12.03	11.46	23.19	52.73
	Degree	25.78	10.87	20.35	36.22
	Diploma	25.06	12.21	24.39	33.81
	Honors	23.8	13.77	20.88	37.02
	Masters	38.45	16.51	17.25	22.78
<b>Occupation</b>	Unemployed-COVID	0.69	9.61	13.72	83.53
	Employed	40.18	16.03	22.81	12.14
	Unemployed	5.72	13.15	16.44	70.81
<b>Monthly HH Income</b>	<5000	14.57	12.53	30.75	34.49
	5000-15000	19.42	17.72	35.74	21.1
	15000-30000	43.59	19.41	20.22	9.07
	30000-50000	50.24	23.42	16.12	7.02
	50000- 100000	60.3	20.96	14.76	5.52
	>100000	60	15.31	15.06	6.24

Note: All the figures reported in the table are row percentages. Here, Reduced Moderately = Reduced 25percent and Reduced Significantly= Reduced 50percent or 75percent

Table 5 below, shows that older respondents had higher food expenditures compared to younger ones. We saw that younger people tended to suffer relatively greater income loss, translating into lower food consumption. We also note that as far as food expenditures are concerned, there was not much difference between rural and urban areas. In fact, rural areas report slightly higher percent of respondents whose expenditures increased – in other words, it cannot really be argued that rural residents were coping better.

There is a positive correlation between household size and the percentage of respondents reporting an increase in expenditure on food items. A similar pattern can be seen with the level of education. But for the respondents with tertiary education, variation in food expenditures is small. As to be expected, those who are unemployed or belong to lower income categories faced sharper reduction in food expenses.

Table 5: Monthly expenditure on food items relative to the pre-lockdown period

		<i>Monthly expenditure on food items relative to the pre-lockdown period</i>				
		Increased Significantly	Increased moderately	Same	Reduced moderately	Reduced Significantly
<b>Age</b>	16-29	11.9	26.72	25.99	20.61	14.78
	30-49	9.05	30.54	30.89	17.69	11.83
	50+	4.69	30.86	36.98	16.6	10.88
<b>Residence</b>	Rural	10.41	30.74	28.53	17.88	12.44
	Urban	8.87	29.58	31.15	18.16	12.24



<b>HH Size</b>	less than 4	7.57	30.81	30.73	17.35	13.54
	4 to 5	8.86	28.97	30.86	18.5	12.81
	6 to 8	10.24	30.34	30.38	18.27	10.76
	9 or more	13.27	31.07	27.68	16.91	11.07
<b>Education</b>	SSC	12.08	24.12	26.69	20.26	16.83
	HSC	9.93	20.26	30.51	21.68	17.63
	Degree	8.74	29.87	30.33	18.66	12.4
	Diploma	12.03	33.14	24.56	19.34	10.93
<b>Occupation</b>	Honors	8.75	30.22	31.03	18.93	11.07
	Masters	8.15	35.22	32.08	15.45	9.11
	Unemployed-COVID	12.17	21.52	27.47	19.65	19.19
	Employed	7.84	34.73	32.53	16.37	8.53
<b>Monthly HH Income</b>	Unemployed	11.24	23.78	26.35	21.01	17.62
	<5000	7.89	20.19	36.36	18.32	17.24
	5000<15000	10.43	28.15	28.93	18.36	14.13
	15000<30000	8.29	37.61	31.58	15.62	6.9
	30000<50000	5.93	39	32.88	16.05	6.15
	50000<100000	4.25	38.27	38.85	15.13	3.5
100000 and over	7.31	28.39	44.09	13.55	6.67	

Note: All the figures reported in the table are row percentages. Here, Reduced Moderately = Reduced 25percent and Reduced Significantly= Reduced 50percent or 75percent

## Coping Ability

Coping was defined in terms of people's ability to face the lockdown successfully in terms of meeting their basic requirements for food and other necessities, including cleansing materials and disinfectants. Generally, the pattern that emerges quite clearly is that household ability to face long lockdown is closely related to income, employment and education most strikingly, while other factors also have some effect, especially age and household size. Generally, rural inhabitants are worse off – which is contrary to popular belief.

## MODEL ESTIMATION RESULTS

### Income Shocks

Ordered logistic models were used to explore the association between the dependent variables and independent variables. The outcome variable in model-1 is the change in the monthly income relative to the pre-lockdown period. Compared to the residents of the village (base) the residents of small towns, large cities, and metropolitans are respectively 1 percent, 4.3 percent, and 5.7 percent more likely to report that their income has stopped and 1 percent, 1.5 percent, and 0.18 percent more likely to report their income has reduced significantly during the lockdown. Further, if the household-size increases the likelihood of reporting reduction or stopping of income increases.

**Table 6 Model-1:** Monthly Income related to the pre-lockdown period (Marginal Effects)

		<i>Monthly Income related to the pre-lockdown period</i>				
		Increased	Remained Same	Reduced Moderately	Reduced Significantly	Stopped
<b>Gender</b>	Male (Base)					
	Female	0.00002	0.0010	0.0000	-0.0002	-0.0008
<b>Age</b>	16-29(Base)					
	30-49	-0.0011***	-0.0390***	-0.0001	0.0086***	0.0316***

<b>Marital status</b>	50+	-0.0009**	-0.0308**	0.0001	0.0068**	0.0248**
	Married(Base)					
	Never married	-0.000005	-0.0002	0.0000	0.00004	0.0002
<b>Residence</b>	Other	-0.0021***	-0.1036***	-0.0187***	0.0216***	0.1028***
	Village(Base)					
	Small Town	-0.0003*	-0.0103*	0.0002	0.0022*	0.0082*
<b>HH size</b>	Large City	-0.0014***	-0.0519***	-0.0009***	0.0115***	0.0428***
	Metropolitan	-0.0018***	-0.0688***	-0.0026***	0.0153***	0.0579***
		-0.0002***	-0.0080***	-0.0003***	0.0018***	0.0067***
<b>Education</b>	SSC (Base)					
	HSC	-0.0004***	-0.0244***	-0.0052***	0.0054***	0.0247***
	Degree	0.0008***	0.0399***	0.0047***	-0.0092***	-0.0362***
	Diploma	0.0009***	0.0447***	0.0050***	-0.0103***	-0.0403***
	Honors	0.0003*	0.0154*	0.0023*	-0.0035*	-0.0145*
	Masters	0.0018***	0.0777***	0.0056***	-0.0178***	-0.0672***
<b>Occupation Status</b>	Unemployed(Base)					
	Employed	0.0108***	0.4244***	0.0170***	-0.0953***	-0.3569***
<b>Monthly HH income</b>	<5000(Base)					
	5000-15000	0.0004***	0.0277***	0.0087***	-0.0056***	-0.0312***
	15000-30000	0.0016***	0.0930***	0.0188***	-0.0208***	-0.0927***
	30000-50000	0.0025***	0.1307***	0.0197***	-0.0296***	-0.1233***
	50000-100000	0.0053***	0.2182***	0.0123***	-0.0490***	-0.1868***
<b>Death in Area</b>	>100000	0.0058***	0.2299***	0.0106***	-0.0516***	-0.1948***
	No (Base)					
<b>Sylhet</b>	Yes	-0.0013***	-0.0494***	-0.0020***	0.0111***	0.0415***
	(Base)					
<b>Barisal</b>		0.0003	0.0100	0.0004	-0.0022	-0.0084
<b>Chattogram</b>		-0.0002	-0.0060	-0.0002	0.0013	0.0050
<b>Dhaka</b>		-0.0006***	-0.0247***	-0.0010***	0.0056***	0.0208***
<b>Khulna</b>		0.0002	0.0061	0.0002	-0.0014	-0.0051
<b>Mymensingh</b>		-0.00004	-0.0014	-0.0001	0.0003	0.0012
<b>Rajshahi</b>		0.0000	0.0005	0.0000	-0.0001	-0.0004
<b>Rangpur</b>		0.0004	0.0159	0.0006	-0.0036	-0.0134

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Note: Here Reduced Moderately = Reduced 10% or 25% and Reduced Significantly = Reduced 50% or 75%

We also find that respondents with HSC degree are 2.4 percent less likely to report that income has remained the same and 2.5 percent more likely to report the 'more than a month category', compared to SSC holders (Table 6). On the other hand, a respondent with a Master's degree is 7.7 percent more likely to report that his/ her income has remained the same and 6.7 percent less likely to report that his/ her income has stopped during the lockdown.

Compared to the unemployed group employed respondents are 42.4 percent more likely to report that their income has remained unchanged and 36 percent less likely to report that their income has completely stopped during the lockdown. Further, higher the household income level, the higher is the likelihood that its income has remained unchanged, compared to the pre-lockdown period. A significant neighbourhood effect is also observed: If a case of death due to corona is reported in the locality, there is a 4.2 percent greater chance that income flows have stopped compared to unaffected localities. A

strong Dhaka-effect is also noteworthy: reduction or stoppage of income flows is more likely for respondents in Dhaka

### Coping Ability

In Model 2 the outcome variable is the expected number of days that respondents reported they could manage to stay in lockdown. Compared to the base category (i.e. male) females are more likely to report fewer number of days: Females are 0.7 percent more likely to report the '1 more week' category and 1 percent less likely to report the 'more than a month' category than their male counterparts.

If the age of the respondent is more than or equal to 50 years, there is a negative likelihood of reporting fewer number of days compared to the base group. The residents of small towns, large cities, and metropolitans are respectively 2 percent, 3 percent, and 5 percent are more likely to report '1 more week' group. If the household size increases, the likelihood of reporting fewer number of days increases. For every additional member in the household, the likelihood of reporting 'more than a month' decreases by 0.8 percent. As before, there is a positive likelihood of reporting a higher category if the respondent has a higher level of education: A respondent with a master's degree is 1.4 percent less likely to report the '1 more day' category and 9 percent more likely to report the 'more than a month category'.

Employment status also plays a crucial role. Compared to the unemployed group, employed respondents are 2.5 percent less likely to report the 'one more day' category and 14 percent more likely to report the 'more than a month' category. The higher the income level of the respondent, the higher is the likelihood of reporting additional days.

If the respondent's family earns 5000 to 15000 taka (BDT 5000-15000) monthly, there is a 0.5 percent likelihood of reporting 'more than a month' category whereas in case of more than 100,000 taka group, this increases to 50 percent. In terms of place of residence ("Divisions"), there is a positive likelihood of reporting additional days from Mymensingh while the opposite is for Chattagram and Rangpur divisions.

**Table 7 Model: 2** Number of days the respondent's family can sustain (Marginal Effects)

		<i>Number of days the respondent's family can sustain</i>				
		<b>1 more day</b>	<b>1 more week</b>	<b>2 more weeks</b>	<b>3-4 more weeks</b>	<b>more than a month</b>
<b>Gender</b>	Male (Base)					
	Female	0.002*	0.007*	0.002*	-0.001*	-0.010*
<b>Age</b>	16-29(Base)					
	30-49	0.003*	0.012*	0.005*	-0.002*	-0.018*
	50+	-0.003*	-0.014*	-0.006*	0.001*	0.023*
<b>Marital status</b>	Married(Base)					
	Never married	-0.003***	-0.013***	-0.005***	0.002***	0.020***
	Other	0.012**	0.039**	0.011***	-0.008**	-0.054**
<b>Residence</b>	Village(Base)					
	Small Town	0.005***	0.020***	0.008***	-0.002***	-0.031***
	Large City	0.008***	0.030***	0.012***	-0.003***	-0.046***
	Metropolitan	0.013***	0.050***	0.018***	-0.007***	-0.074***

Note: *** $p < 0.01$ , ** $p < 0.05$ , * $p < 0.1$  This section attempted to explain	<b>HH Size</b>		0.001***	0.005***	0.002***	-0.001***	-0.008***
	<b>Education</b>	SSC(Base)					
		HSC	0.015***	0.051***	0.011***	-0.016***	-0.060***
		Degree	0.000	0.001	0.000	0.000	-0.001
		Diploma	-0.007***	-0.027***	-0.010***	0.006***	0.038***
		Honors	-0.007***	-0.028***	-0.011***	0.006***	0.040***
		Masters	-0.014***	-0.060***	-0.026***	0.009***	0.090***
	<b>Occupation Status</b>	Unemployed(Base)					
		Employed	-0.025***	-0.094***	-0.035***	0.014***	0.140***
	<b>Monthly HH Income</b>	<5000 (Base)					
		5000-15000	-0.015***	-0.053***	-0.008***	0.023***	0.053***
		15000-30000	-0.029***	-0.119***	-0.035***	0.042***	0.141***
		30000-50000	-0.039***	-0.173***	-0.075***	0.043***	0.244***
		50000-100000	-0.046***	-0.222***	-0.131***	0.017***	0.383***
		>100000	-0.050***	-0.250***	-0.174***	-0.022***	0.495***
	<b>Death in Area</b>	No					
		Yes (Base)	0.007***	0.027***	0.010***	-0.004***	-0.041***
<b>Sylhet</b>							
<b>Barisal</b>		-0.001	-0.004	-0.001	0.001	0.006	
<b>Chattogram</b>		0.005**	0.019**	0.007**	-0.003**	-0.029**	
<b>Dhaka</b>		0.001	0.002	0.001	0.000	-0.004	
<b>Khulna</b>		0.003	0.013	0.005	-0.002	-0.019	
<b>Mymensingh</b>		-0.008**	-0.028**	-0.010**	0.004**	0.042**	
<b>Rajshahi</b>		0.001	0.004	0.001	-0.001	-0.006	
<b>Rangpur</b>		0.006**	0.021**	0.008**	-0.003**	-0.031**	

ore shocks on employment, income, expenditure, and coping ability of respondents under lockdown. Very little gender differences were found in terms of shocks on income and expenditure. However, in terms of age-groups, younger people were found to be more adversely affected and older groups reported increased expenditures. As expected, education plays a strong protective role in helping to reduce shocks. Typically, SSC and HSC degree holders were the ones who were most affected. Strong neighbourhood effects were also noted.

In terms of coping ability, we found significant gender and age differences – women were more likely to report fewer number of days they could cope under lockdown while older people reported longer periods. Similarly, higher household size meant lower ability to cope while education had the opposite effect.

#### IV Knowledge, Attitude and Practices

In this section we explore adoption behaviour with regard to good preventive practices as advised by WHO and the Government of Bangladesh. The association of various socio-economic characteristics such as gender, education level, mother's education, monthly personal income, rural-urban location, and how strictly the lockdown was practiced in the respondents' localities with each of the behavioural variables, was examined. Both the independent and the dependent variables of interest excluding age of the respondent, are categorical. For the regression models used in this section, age of the respondent is treated as a continuous variable.

Binary logistic models were used to estimate the Odds ratio (OR) with a 95 percent confidence interval (CI) to identify the factors significantly associated with the decision to use masks, wash hands, and maintain social distance, as earlier described.

Different socio-economic characteristics such as the age of respondents, gender, level of education, Income, and knowledge are expected to be associated with the adaption of preventive measures (Tang, 2003). A study by (Chen, 2020), on primary school students in Wuhan, China showed that mother’s education has a significant association with better hand hygiene and mask-wearing behavior. Hygiene practices start in early childhood within the family and the mother plays an important role in developing these practices, thus we included mother’s education in our model.

There is an extensive literature (Seale, 2020) which shows that socio-economic characteristics such as Age, Education, Location of residence, and Knowledge influence adoption of preventive practices. While lack of knowledge prevents people from adopting good hygiene practices, pressure from employers and the government appears to play a useful role in encouraging behavioural change.

Location of residence can also influence behaviour as urban areas have some evident advantages over rural areas with regard to information and education. Thus, urban residents are expected to have higher odds of wearing masks (Haischer, 2020). The adoption of preventive practices also depends on how other people in society are behaving. People feel more encouraged and comfortable when other people in the community also adopt good practices (Knotek II 2020). This aspect was covered in our model by including a variable to reflect how strictly the lockdown was observed in the respondent’s neighbourhood.

We also wanted to see what factors constrain observance of social distancing when outside the home. Having to go to work, location of residence, perceived susceptibility, perceived efficacy, and trust in authority play an important role in these respects (Lau 2010; Seale, 2020).

To understand the associations of different socio-economic characteristics<sup>11</sup> with the use of masks, frequency of washing hand, and maintaining social distance we ran three regression models. In our first model, we wanted to see what factors influence the use of masks and in the second model we tried to find the factors influencing frequent hand washing. In the third model, we wanted to see what factors work as an obstruction for an individual to maintain social distance while going outside.

**Table 8: Expected sign of coefficients of the independent variables for models explaining mask use and handwashing**

Independent variables	Expected sign of the coefficient
Age	Positive
Female dummy	Not significant
Education	Positive
Mother’s education	Positive
Monthly income	Positive
Knowledge on how the infection is spread	Positive
Living in a rural area	Positive/Negative

<sup>11</sup> All the summary statistics for these variables are given in table A1 in the Appendix Section.

Lockdown maintained strictly in the area	Positive
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We expect Age, Education, Mother’s education, Monthly income, knowledge of how Coronavirus infection spreads, and lockdown observance measures to positively impact the mask use and handwashing. Wearing a mask may seem 'unmanly' to some men, but a gender difference in using masks and handwashing is not frequently seen. (Clark, 2020) found that women are more likely to adapt to new hygiene and preventive practices than men but the study didn’t find age to have any influence. We would also like to see if there is any significant difference between rural and urban areas.

**Table 9: Expected sign of regression coefficients of variables used to explain social distance**

Independent variables	Expected sign of the coefficient
Age	Positive
Female dummy	Not significant
Education	Positive
Working from home	Positive
Frequency of going out	Negative
Knowledge on what is social distance	Positive
Living in rural area	Positive/Negative
Lockdown maintained strictly in the area	Positive

Age, working from home, knowledge on social distance and strictly maintained lockdown in the area are expected to have a positive influence on maintaining social distance. We are interested to find out, how going outside more frequently and living in a rural area are associated with being able to maintain social distance. The relationship to rural-urban location could go either way while rural areas are less congested, this allows people to keep a distance more readily while urban areas are better endowed with information and more active peer-monitoring.

### Descriptive Analysis

Our survey data shows that most of the participants used masks (94 percent), and the percentage of those washing their hand 4-6 times was over 41 percent and those washing 7-10 times was over 48 percent. We also note that 70 percent were able to maintain social distance, while 29 percent reported that they were unable to maintain social distance although they wanted to. In this section we analyzed the association of various socio-economic characteristics with each of the behavioral variables of interest.

To simplify our cross-table analysis, we created fewer groups for the variable on the use of masks. Those who reported using masks 'never' or 'rarely' are collapsed into one group. The hand washing frequency categories are divided into three groups with frequencies of 1-3 times, 4-6 times, and 7-10 times.

**Table 10: Association between Use of Mask and different socio-economic and Covid-19 related**

	rarely	sometimes	always	Chi2 (p-value)
<b>Gender</b>				
Male	0.45	5.16	94.39	0.15
Female	0.61	5.02	94.36	
<b>Education</b>				
SSC	0.61	6.75	92.64	0
HSC	0.65	6.87	92.48	
Honours equivalent	0.60	5.75	93.65	
Master's equivalent	0.42	3.65	95.94	
<b>Mother's education</b>				
below class 5	0.31	6.93	92.76	0
Class 5-9	0.81	5.3	93.89	
SSC	0.49	3.16	96.35	
HSC	0	2.16	97.84	
Honours	0	2.8	97.2	
Master's	0	1.73	98.27	
<b>Income level of the respondents</b>				
<5000	0.8	9.89	89.3	0
5000-15000	0.28	5.8	93.92	
15000-30000	0.45	3.84	95.71	
30000-50000	0.33	2.99	96.68	
50000-100000	0.48	1.91	97.61	
>100000	0.65	3.66	95.7	
<b>Knowledge on infection spreading through cough &amp; sneeze</b>				
no	0.43	6.84	92.74	0
yes	0.51	4.95	94.54	
<b>Location of residence</b>				
Village	0.71	10.68	88.6	0
Upazilla town	0.33	4.38	95.28	
Zilla and divisional town	0.53	2.95	96.52	
Metropolitan	0.38	2.74	96.88	
<b>Lockdown degree</b>				
a little	0.88	7.8	91.32	0
not at all	0.45	5.04	94.51	
pretty well	0.22	1.75	98.03	

From the cross-tabulation above, we can see that gender is not significant. The level of education, including mother's education is significant. For the SSC group (93 percent) and the group with a Master's degree, it is (96 percent).<sup>12</sup> Income also influences mask use -the higher the monthly income, higher the percentage of people using masks. The decision to use masks increases with the awareness of how the infection spreads. Relatively lower mask use is found in villages (87 percent) compared to Metropolitan areas (97 percent). A stricter lockdown also improves mask use frequency.

<sup>12</sup> The independent variable, Level of education has 4 categories which are completion of SSC, HSC, Honors equivalent, and Masters equivalent degree, Participants with diploma and degree level education are excluded for this section.

**Table 11: Association between Frequency of washing hands and different socio-economic and Covid19 related**

<b>Gender</b>	<b>1-3 times</b>	<b>4-6 times</b>	<b>7-10 times</b>	<b>Chi2 (p)</b>
Male	10.18	41.83	48	0.111
Female	9.67	41.14	49.19	
<b>Education</b>				
SSC	11.92	44.94	43.14	0
HSC	11.93	40.09	47.98	
Honours equivalent	9.89	41.22	48.89	
Master's equivalent	8.75	40.86	50.39	
<b>Mother's education</b>				
below class 5	11.98	41.88	46.14	0
Class 5-9	9.38	42.33	48.29	
SSC	8.7	42.38	48.92	
HSC	8.21	37.52	54.27	
Honours	9	40.03	50.96	
Master's	7.13	35.84	57.03	
<b>Income level of the respondents</b>				
<5000	15.64	42.65	41.71	0
5000-15000	9.79	40.53	49.68	
15000-30000	8.66	39.3	52.03	
30000-50000	8.32	41.71	49.97	
50000-100000	6.63	41.24	52.12	
>100000	7.53	35.05	57.42	
<b>Knowledge on infection spreading through touching surfaces</b>				
no	11.62	42.77	45.61	0
yes	9.85	41.49	48.66	
<b>Residence</b>				
Village	12.72	44.56	42.72	0
Upazilla town	10.88	40.49	48.63	
Zilla and divisional town	8.46	40.65	50.89	
Metropolitan	8.55	40.58	50.87	
<b>Lockdown degree</b>				
a little	12.4	42.47	45.14	0
not at all	9.94	42.41	47.66	
pretty well	7	36.37	56.62	

As with mask use, gender was not found to have any influence on hand-washing. However, education, mother's education and income were found significant, as before. Further rural areas display a lower frequency which however, rises with stricter lockdown experience.

**Table 12: Association between maintaining social distance and different Socioeconomic and COVID 19**

<b>Maintaining social distance</b>	<b>Want to but</b>	<b>No</b>	<b>Yes</b>	<b>Chi2</b>
<b>Gender</b>				
Male	29.63	0.19	70.18	0.087
Female	28.43	0.17	71.4	
<b>Education</b>				
SSC	23.93	0.40	75.68	0
HSC	25.86	0.08	74.07	
Honours equivalent	30.35	0.09	69.56	



Master's equivalent	31.91	0.19	67.90	
<b>Work place during corona situation</b>				
office	38.35	0.25	61.4	0
at home	28.29	0.03	71.68	
Total	33.07	0.14	66.8	
<b>How many times do you go to outside the home?</b>				
not at all	12.67	0.43	86.91	0
once a day	33.96	0.26	65.78	
once a week	22.02	0.07	77.91	
once or twice a week	29.2	0.06	70.74	
<b>Knowledge on Social Distance</b>				
I don't know	36.11	2.78	61.11	0
1 feet distance	26.62	0	73.38	
3 feet distance	28.97	0.17	70.85	
6 feet distance	31.4	0.18	68.42	
<b>Residence</b>				
Village	31.19	0.2	68.61	0
Upazilla town	29.09	0.33	70.58	
Zilla and Divisional town	28.79	0.11	71.1	
Metropolitan	27.92	0.14	71.93	
<b>Lockdown degree</b>				
a little	43.83	0.42	55.75	0
not at all	29.26	0.15	70.59	
pretty well	8.68	0	91.32	

The association between education level and status of social distance maintained is interesting. The higher the level of education the higher the percentage of individuals who are unable to maintain social distance. Also we can see, the following characteristics improved social distancing: working at home (as opposed to working at office), people who go out less frequently, who have better access to knowledge about minimum distance that ought to be maintained, living in cities as opposed to villages as well as those who experience a stricter lockdown.

## Regression Results

**Table 13: Logit regression results for factors influencing the use of masks**

Dependent variable: using mask always=1	(1) Logit coeff	(2) Odds ratio
<b>Independent variables</b>		
Age	0.000225 (0.00582)	1.000 (0.00582)
Female dummy	-0.0194 (0.0792)	0.981 (0.0777)
<i>Base level: Education level: SSC</i>		
Education level : HSC	0.311** (0.145)	1.364** (0.197)
Education level: Honours	0.219* (0.120)	1.245* (0.149)
Education level: Master's	0.538*** (0.114)	1.713*** (0.196)
<i>Base level Mother's education level: &lt; class 5</i>		
Mother's education level : class 5-9	0.115	1.122

	(0.0824)	(0.0924)
Mother's education level : SSC	0.389***	1.475***
	(0.127)	(0.188)
Mother's education level : HSC	1.045***	2.844***
	(0.247)	(0.703)
Mother's education level : Honours	0.289	1.336
	(0.251)	(0.336)
Mother's education level : Master's	1.164**	3.203**
	(0.589)	(1.885)
<i>Base level: Monthly income &lt; 5k</i>		
Monthly income 5k-15k	0.390***	1.477***
	(0.144)	(0.213)
Monthly income 15k - 30k	0.557***	1.746***
	(0.147)	(0.257)
Monthly income 30k-50k	0.552***	1.738***
	(0.170)	(0.296)
Monthly income 50k-100k	0.762***	2.142***
	(0.217)	(0.466)
Monthly income >100k	0.266	1.305
	(0.293)	(0.383)
Corona spreads by Cough & Sneezes dummy	0.595***	1.813***
	(0.114)	(0.206)
Living in rural area dummy	-1.009***	0.365***
	(0.0792)	(0.0289)
Lockdown is maintained in the area dummy	1.168***	3.215***
	(0.184)	(0.591)
Constant	1.724***	5.608***
	(0.272)	(1.527)
Observations	16,890	16,890

Note: Standard errors in parentheses \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

From this model (table 13), we find Age, a continuous variable, is not statistically significant. The gender dummy (for female) is also not statistically significant. Compared to the base education level (SSC) we note that the odds of always wearing a mask improves with education: it is 36 percent higher for HSC, 25 percent higher for Honours and 71 percent higher for those with Master's degrees.

For mother's education, the trend is similar: compared to the base category (class 5 passed), the odds improve steadily with education. For SSC the odds are 48 percent higher and for HSC and Master's degree holders, it is 2.84 times and 3.2 times higher, respectively.

Groups with higher monthly incomes also have higher odds of wearing masks compared to the base group (income of less than BDT 5000). The increase in likelihood for an individual with monthly family income from 5000 to 15000 is 48 percent, the odds are 75 percent higher for the BDT15000-30000 category, and so on, until the odds become 2.14 times higher for those in the range 50000-100000.

The likelihood of a person wearing masks is 81 percent higher for those who know how the virus spreads.<sup>13</sup> Similarly, villagers are less likely to wear masks as are those who live in areas where lockdown observance is less strict<sup>14</sup>.

**Table 14: Logit regression results for factors influencing handwashing behaviour**

Dependent variable: washing hand 7-10 times a day =1	(1) Logit coeff	(2) Odds ratio
Independent variables		
Age	-0.0140*** (0.00242)	0.986*** (0.00239)
Female dummy	0.00918 (0.0330)	1.009 (0.0333)
<i>Base level: Education level: SSC</i>		
Education level : HSC	0.114 (0.0713)	1.120 (0.0799)
Education level: Honours	0.110* (0.0595)	1.116* (0.0664)
Education level: Master's	0.0681 (0.0559)	1.070 (0.0598)
<i>Base level Mother's education level: &lt; class 5</i>		
Mother's education level : class 5-9	-0.0557 (0.0371)	0.946 (0.0351)
Mother's education level : SSC	-0.00268 (0.0488)	0.997 (0.0486)
Mother's education level : HSC	0.253*** (0.0656)	1.288*** (0.0845)
Mother's education level : Honours	0.200** (0.0874)	1.221** (0.107)
Mother's education level : Master's	0.391*** (0.134)	1.479*** (0.198)
<i>Base level: Monthly income &lt; 5k</i>		
Monthly income 5k-15k	0.314*** (0.0827)	1.369*** (0.113)
Monthly income 15k - 30k	0.397*** (0.0824)	1.488*** (0.123)
Monthly income 30k-50k	0.311*** (0.0874)	1.364*** (0.119)
Monthly income 50k-100k	0.403*** (0.0952)	1.497*** (0.143)
Monthly income >100k	0.609*** (0.127)	1.839*** (0.234)
Corona spreads by touching surface dummy	0.191*** (0.0398)	1.211*** (0.0481)
Living in rural area dummy	-0.252***	0.777***

<sup>13</sup> Knowledge of Corona Infection is a dummy variable which takes the value 1 if the respondent is aware of coronavirus being spread by cough and sneeze and 0 otherwise

<sup>14</sup> Lockdown maintained is a dummy variable used in regression model for this section, which is 1 if lockdown in the resident's area is maintained pretty well and 0 otherwise.

	(0.0393)	(0.0306)
Lockdown is maintained in the area dummy	0.392***	1.480***
	(0.0491)	(0.0727)
Constant	-0.0246	0.976
	(0.128)	(0.125)
Observations	16,890	16,890

Note: Standard errors in parentheses \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Table 14 shows the regression results for the second (hand-washing) model. We see that Age is statistically significant but negatively related to frequency of hand washing with the odds of an individual washing hands 7-10 times a day being slightly lower (1.4 percent) at the margin, compared to someone a year younger.

Similar to the use of masks, the female dummy is also statistically insignificant in this model. For an Honours graduate, the odds of washing hands 7-10 times a day is 12 percent higher compared to an SSC.

For mother's education, we find a significant and positive relationship with hand-washing. The odds are 29 percent higher for HSC, 22 percent higher for Honours graduates, and 48 percent higher for Master's, compared to the base level.

Groups with higher monthly income also have higher odds of washing hands frequently. This is 37 percent higher for the 5000-15000 taka group, 49 percent higher for the 15000-30000 taka group, and as much as 84 percent higher for those with monthly incomes above 50000.

Knowledge of how infection spreads has an influence on handwashing (21 percent)<sup>15</sup>. Rural-urban location was also found significant (22 percent lower in villages compared to urban areas). A 48 percent increase in hand-wash odds is seen for a person if he is living in an area where lockdown was more strictly observed.

**Table 15: Logit regression results for factors influencing social distancing behavior**

Dependent Variable: Social Distance Practice=1	(1) Logit coeff	(2) Odds ratio
<b>Independent Variables</b>		
Age	0.000750 (0.00253)	1.001 (0.00253)
Female dummy	-0.000272 (0.0356)	1.000 (0.0356)
<i>Base level: Education level: SSC</i>		
Education level: HSC	0.0269 (0.0780)	1.027 (0.0801)

<sup>15</sup> The dummy on knowledge of coronavirus infection used in this model, is 1 if the respondent is aware of coronavirus being spread through touching surfaces and 0 otherwise.

Education level: Honours	-0.0533 (0.0630)	0.948 (0.0597)
Education level: Master's	-0.242*** (0.0574)	0.785*** (0.0451)
<i>Base: Work in Office</i>		
Work from home dummy	0.385*** (0.0373)	1.470*** (0.0548)
<i>Base: Doesn't go out</i>		
Goes out once a week	-0.747*** (0.101)	0.474*** (0.0480)
Goes out once or twice a week	-0.411*** (0.109)	0.663*** (0.0723)
Goes out once a day	-0.691*** (0.101)	0.501*** (0.0507)
Having idea about social distance dummy	0.864** (0.392)	2.372** (0.930)
Living in rural area dummy	-0.0450 (0.0409)	0.956 (0.0391)
Lockdown is maintained in the area dummy	1.401*** (0.0721)	4.057*** (0.292)
Constant	0.309 (0.418)	1.362 (0.570)
Observations	16,904	16,904

Note: Standard errors in parentheses \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

In table 15, Age and the gender dummy (for female) are not statistically significant. Compared to an individual with SCC education, the odds of being able to maintain social distance is 21 percent lower for someone with Master's degree. Working from home increases ability to social distance by around 47 percent.

As to be expected, people who frequently go out have higher odds of being unable to observe social distance. For groups going out once a week, once or twice a week, and once a day, the odds are respectively 53 percent, 34 percent, and 50 percent lower compared to those who stay home. Those who have knowledge of social distance<sup>16</sup>, have 2.37 times higher likelihood of preserving social distance while location appears to have no significant effect. If a lockdown is maintained properly in the respondent's area, it improves the likelihood of social distancing by 4 times

To sum up this section, the results of our study suggest that mother's education, knowledge of COVID-19 and monthly income positively impacts the choice of frequently mask-use and washing hands. In addition, no gender difference was found; Age had no statistically significant association with use of masks or social distancing but was found to have a negative association with hand-washing.

<sup>16</sup> The variable knowledge on social distance takes the value 1 if the person knows the answer, or else= 0.

Compared to towns and cities, villages lagged substantially behind in adoption of preventive practices discussed. A stricter imposition of lockdown, better awareness and motivation improves adoption of good preventive practices.

## V COVID-19 and Domestic Violence

A concern that is being increasingly raised in the context of COVID-19 is the effect that it appears to be having on domestic violence, especially during lockdown in conditions when people are forced to be confined indoors for prolonged periods. This has stimulated a growing literature on the impact of COVID on different forms of abuse and violence, including interpersonal violence (IPV), Sexual or Gender Based Violence (SGBV), domestic violence (DV) and self-harm and psychological outcomes.<sup>17</sup>

In this section, we ask whether a lockdown tends to increase violence, and if so, what can we say about its scale and the nature of violence experienced? Thus, the main hypothesis examined is that lockdowns due to COVID-19 has led to rising domestic violence, both verbal and physical. This experience is associated with a growing sense of insecurity that COVID-19 has unleashed, and appears to be influenced by worsened socio-economic conditions in addition to COVID-like symptoms and morbidity. It is likely that this would also be reflected in certain spatial patterns (e.g. rural-urban) as well.

Three questions were asked to respondents to obtain an idea about the state of domestic violence. A fourth question was also asked to understand the extent of worry or anxiety that COVID-19 has generated, which could contribute to increased tensions within a household:

1. Are you experiencing rising frequency of arguments and quarrels because you are forced to be at home?
2. Indicate a scale for frequency of quarrel (1=low and 5=high – almost every day)
3. Are your quarrels only verbal or does it lead to physical violence? (verbal, physical or both).
4. If you are feeling unsafe during lockdown due to increased crime or fears of social instability, please rate your fear (Scale: 1-5).

Around 8 percent of respondents out of almost 30,000 canvassed stated that they lived alone and did not respond to the first three questions.

### The State of Domestic Violence Under Lockdown

Around 25percent of respondents living with families stated that arguments and quarrels, including physical violence have increased under lockdown. The frequency of such cases is reported in Table 16

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<sup>17</sup> See, for example Olding et al. (2020) for a study on self-harm and psychotic disorder, Moreiraa and Da Costa (2020) for a literature review of impact on IPV, Bullinger (2020) Pose on DV and Flowe et al. (2020) on impact of economic losses in heightened experience of DV. Another study finds considerable evidence of abuse and DV/IPV under lockdown (Bradbury-Jones and Isham, 2020).

below. In other words, quite a significant proportion have reported increasing violence although reported incidence of physical violence is low. However, bearing in mind that the reference period for these questions was one month prior to response, the frequency of violence, including self-reported physical violence (which itself is likely to be understated) is not low. Table 16 (last column) also reveals the structure of violence reported: physical violence alone or combined with verbal violence is over 6percent of all cases of violence reported.

Another indicator of domestic unhappiness is available: this refers to the frequency of quarrels reported on a scale of 1 to 5, on an ascending order of frequency, with 5 indicating almost daily quarrels (Table 17). In a sense, the evidence here may in fact reflect a more accurate picture of the state of domestic violence as the way the question is posed here is less judgmental. We observe that 16.2 percent of respondents in fact, indicated that they quarreled frequently or very frequently while at the lower end of the scale, 60 percent reported little or no quarrels. In the middle (score of 3) the response rate was 26percent. That is to say, we find quite a large number of people reporting domestic unhappiness, arguments, quarrels and even physical violence even in a situation of ‘soft’ lockdown that was imposed on Bangladesh. The cross-tabulation reported in Table 18 bears out the strong association between quarrel type and quarrel degree with the Chi<sup>2</sup> found to be highly significant. Frequency of quarrel does lead to increased incidence of physical violence.

Table 16: Reported Violence by Type (Respondents Living with Families)

Type	Cases	Percent (all responses)	Percent (cases of violence)
None	20569	75.10	-
Verbal only	6406	23.39	93.97
Both verbal and physical	338	1.23	4.96
Physical	73	0.27	1.07
Total	27386	100	100

Table 17: Frequency of Domestic Quarrels (Respondents Living with Families)

Scale (1-5)	Frequency	Percent	Cum. Percent
1	1957	28.71	28.71
2	2080	30.51	59.22
3	1676	25.59	83.81
4	455	6.67	90.48
5	649	9.52	100

Table 18: Cross tabulation: Quarrel Type vs Quarrel Degree

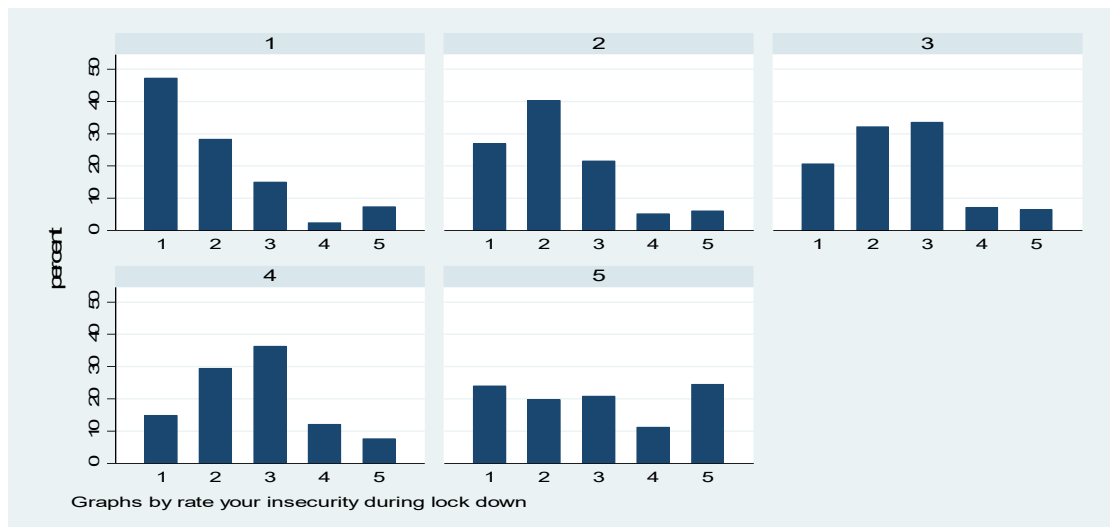
Is the quarrel physical or verbal?	Degree of Quarrel					Total
	1	2	3	4	5	
Verbal	1924	2020	1581	389	492	6406
Row percentage	30.03	31.53	24.68	6.07	7.68	100
Column percentage	98.31	97.12	94.33	85.49	75.81	93.97
physical	9	12	20	6	26	73
Row percentage	12.33	16.44	27.40	8.22	35.62	100
Column percentage	0.46	0.58	1.19	1.32	4.01	1.07
Both	24	48	75	60	131	338
Row percentage	7.1	14.2	22.19	17.75	38.76	100
Column percentage	1.23	2.31	4.47	13.19	20.18	4.96
Total	1957	2080	1676	455	649	6817
Row percentage	28.71	30.51	24.59	6.67	9.52	100.00
Column percentage	100.00	100.00	100.00	100.00	100.00	100.00

Note: All bi-variate associations tested were significant according to the chi-square test.

Table 19: COVID-19 - Induced Insecurity

Insecurity scale	Freq.	Percent	Cum.
1	10689	35.93	35.93
2	5138	17.27	53.2
3	8162	27.44	80.64
4	2396	8.05	88.69
5	3364	11.31	100
Total	29749	100	

Figure 3: Frequency of Quarrels by Level of Insecurity<sup>18</sup>



<sup>18</sup> Insecurity degree describes respondents concerns with regard to safety and security under lockdown.



Another scale was employed to assess fear and anxiety that has been generated by COVID-19 (Table 19). Here, we observe quite a polarization with 53 percent not particularly insecure or fearful while at the other end, over 19 percent appear very insecure (scale 4 or 5). It appears that this scale is similar to the frequency of quarrel scale shown earlier in Table 2. A cross-tabulation of the two variables indeed shows that strong association between the two (Figure 3).<sup>19</sup>

In other words, there seems to be a strong suspicion that that the onset of COVID-19 has generated fears and anxieties, and the added uncertainty introduced into people’s lives by lockdown and business closures, had a palpable impact on domestic peace. This is pursued further below.

#### District-Wise Variation in Violence Indicators

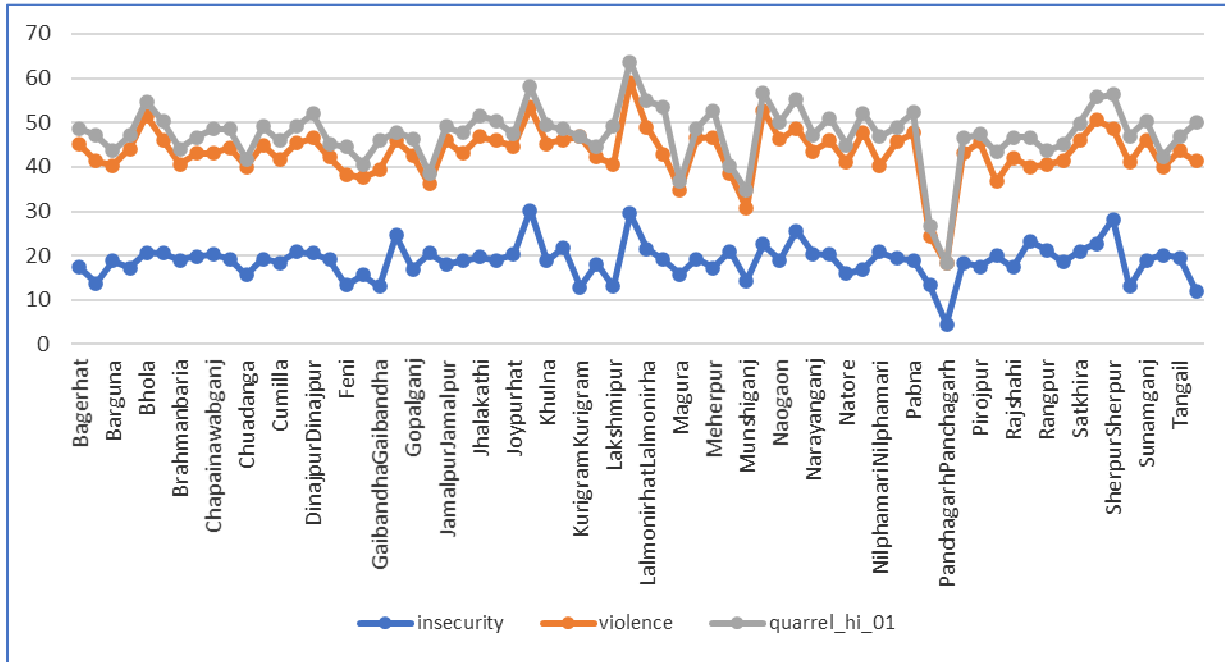
The two indicators of violence used here are frequency of domestic quarrels and actual violence involving physical threats. Both were operated as dummy variables. In the former case, respondents reporting high frequencies (4 or 5 on the scale) were designated as ‘1’ while lower scores (0-3) were designated as ‘0’. In the latter case, respondents reporting physical, or verbal and physical, incidents were designated as ‘1’ while all others were ‘0’. At the district level, these were collapsed as the district average percentage for each. As observed earlier, insecurity also has a bearing on domestic peace and was also tracked here. Table below indicates the district averages for violence, high-frequency domestic quarrel and severe insecurity as percentages of respondents. Figure 2 displays these three variables to show their dispersion across districts. We see quite a close correspondence between violence and quarrels across districts. While insecurity rates are much lower, these too seem to correspond well with the observed inter-district patterns.

Table 20: Violence Indicators: District Averages

Variable	Obs.	Mean	Std. Dev.	Min	Max
Domestic Violence	68	24.35	4.27	11.11	33.87
High-Frequency	68	4.185294	1.916683	0	10.71
Insecurity percent	68	18.86191	4.012375	4.55	30.23

<sup>19</sup> The chi2 measure of association between these two variables was found to be statistically highly significant (chi2(16)=991.666 Pr=0.000).

Figure 4: Insecurity, Quarrels and Violence by Districts



We observe however, that adverse effects on income and employment are associated with domestic violence, and these associations are statistically significant. At the same time, we also see that indicators related to household coping also have an association with violence.

Thus, in Table 21 we observe that a drop in income due to COVID is clearly associated with all three indicators (of violence/insecurity). Thus, if income has remained unchanged after COVID, the incidence of domestic violence is found to be around 20 percent. This figure moves up systematically with every drop in income reported, rising to nearly 30 percent when earnings reportedly stopped. A similar picture emerges for those who lost their jobs. This group reports higher domestic violence levels compared to not only those who remain employed but also compared to those whose unemployment status is not COVID-related.

Similarly, it is striking to see the strong association between COVID symptoms and domestic violence. The base level percentage (for 0 symptoms) is 23.7 percent. This moves quickly with the number of symptoms, reaching 39 percent for 4 symptoms and 46 percent for 5 symptoms! A similar picture emerges for ‘frequent domestic quarrels’ and ‘insecurity’ as associated with COVID symptoms.

We also examined if there was an association with variables that have a bearing on coping ability including household food reserves, cash in hand and even availability of disinfecting materials. Once again, these too were found to have a strong association with domestic violence and insecurity.

Table 21: Domestic Violence and Insecurity, and Effects of Changes in Income, Employment, Food and Money reserves

Changes in Variables	Domestic Violence (verbal/physical)	Frequent Domestic	Insecurity/ Fear
<i>Income Change</i>			
- Same	19.9	2.6	15.1
- Reduced 10percent	21.5	1.9	15.3
- Reduced 25percent	24.1	4.0	20.4
- Reduced 50percent	24.4	4.5	20.3
- -Reduced 75percent	26.1	4.8	25.6
- Reduced 100percent	29.2	5.1	21.0
<i>Employment Status</i>			
- Unemployed due to COVID	32.3	5.8	22.3
- Unemployed (looking)	28.7	5.2	19.5
- Housewife	25.2	5.1	19.1
- Student	21.5	5.1	19.4
- Employed	22.5	3.1	18.5
<i>Food Reserves (number of</i>			
- No reserve	30.9	6.17	21.6
- Two weeks	23.8	3.35	18.7
- One month	22.5	3.61	18.4
- Two months	16.9	2.01	18.1
- More than 2 months	15.6	2.11	16.7
<i>Stocks of Cleaning Agents (number of</i>			
- No reserve	32.6	6.64	22.6
- Two weeks	24.6	3.99	18.3
- One month	20.6	2.19	18.5
- Two months	20.7	3.09	24.2
- More than 2 months	15.4	3.12	14.6
<i>Cash in hand (number of</i>			
- No reserve	31.5	6.94	21.7
- Two weeks	25.0	3.78	19.1
- One month	21.8	2.66	17.1
- Two months	17.3	1.78	22.8
- More than 2 months	17.4	2.19	18.7
<i>Number of COVID-like Symptoms</i>			
- 0	23.7	3.74	18.6
- 1	32.6	6.91	24.3
- 2	35.9	5.36	26.0
- 3	39.6	5.49	25.8
- 4	38.7	10.0	24.0
- 5	45.8	16.9	38.6

Note: All bi-variate associations tested were significant according to the chi-square test.

## Domestic Violence and COVID-19: Some Probit Regression Results

### *The Dependent Variables (Yi)*

1. Domestic Violence: Domestic violence, expressed as a percentage of respondents stating yes=1 or no=0 to verbal or physical violence.
2. High-frequency quarrels: Frequent domestic quarrels, expressed as percentage of respondents who report occurrence of frequent (several times a week or 'almost' daily), yes=1 no=0.

3. Insecurity: percent of respondents who have reported high insecurity (a score of 4 or 5 =1, else=0, on a scale of 1-5).

*Explanatory and Control Variables*

Variable	Description	Expected direction with dependent variables
INC_CH	Income change due to COVID :	Positive
UNEM_COR	Unemployed due to corona	Positive
NUM_SYM	Number of COVID -like symptoms	Positive
FOOD_ST	Food reserves	Negative
CLEANING MAT	Soap/Cleaning material stocks	Negative
MONEY_RES	Cash in hand	Negative
DEATH	Death in neighbourhood due to COVID	Positive
PATIENTS	COVID patients reported in neighbourhood	Positive
Age	Age of respondent	Negative
Education	Education level of respondent	Negative
Household members	Household size (number)	Negative
Monthly income	Monthly income size-group	Negative

*Probit Regression Results*

Table 22: Explaining Violence, Quarrels and Insecurity

Variable	Domestic Violence		High-frequency quarrels		Insecurity	
	coefficient	Z	Coefficient	Z	Coefficient	Z
INC_CH	.032***	5.93	.016*	1.70	.064***	11.35
UNEM_COR	.133***	5.00	.026	0.63	.081**	2.86
NUM_SYM	.144***	12.06	.114***	6.61	.091***	7.29
MONEY_RES	-.056***	-5.33	-.100***	-5.24	.009	0.81
CLEANING MAT	-.081**	-6.63	-.106***	-4.93	-.019	-1.51
FOOD_ST	-.045***	-3.79	-.019	-0.95	-.025**	-2.01
Age	-.002**	-2.09	-.003*	-1.68	-.008***	-7.10

Education	.036***	7.76	.012	1.55	.033***	6.68
Household	.004	0.94	-.004	-0.93	.007	1.47
Monthly income	-.009	-1.42	-.04***	-3.38	.034***	4.82
PATIENTS	-	-	-	-	.040*	1.65
DEATH	-	-	-	-	.124***	3.26
Constant	-.566**	-8.70	-1.24**	-11.26	-1.26***	-16.25
Prob > chi2 =	.0000		.0000		.0000	

Note: \* significant at 10percent; \*\* significant at 5percent; \*\*\* significant at 1percent

The regressions confirm our hypothesis of a direct association between COVID -related variables and the three dependent variables used to represent (some aspect) of domestic violence. If we look at ‘domestic violence’ in Model 1, we see that number of corona-like symptoms, income shock and employment shock due to corona are all positively related. All three coefficients are seen to be highly significant at the 1 percent level. This is true even after controlling for a variety of factors related to individual and household characteristics, including cash and food reserves and monthly income.

In Model 2, the dependent variable is ‘high-frequency quarrels’ reported by respondents. This tells us what proportion of respondents reported very frequent domestic quarrels scoring 4 or 5 on a scale of 1 to 5. This is the group which is prone to physical violence. Interestingly, the coefficient for income shock is significant only at 10percent level while the employment shock coefficient is not significant. However, the NUM\_SYM coefficient is found to be highly significant here showing that experience of corona-like symptoms tends to destabilize households. The control variables in this model are the same as in model 1 and behave in the same manner, except for ‘education’ which has the ‘correct’ sign but is not significant.

In Model 3, the dependent variable is “Insecurity” (measured on a 1 to 5 scale). Here, all three COVID variables are significant at 1percent or 5percent levels. The control variables here behave in a similar fashion to Models 1 and 2. Two additional COVID -related variables were also tested here, namely number of COVID patients and deaths reported in the neighbourhood. It may be noted that the coefficient for DEATH was highly significant (1percent level) while PATIENT was also significant but at the 10percent level. This suggests that there are strong neighbourhood effects that come into play informing behaviour, by contributing to stress.

Generally, the probit regressions provide a strong indication that COVID symptoms and COVID -related shocks that affect employment and incomes have a significant impact on domestic peace and tranquility.

## VI Conclusion

This study is based on data generated online which covered all socio-economic groups and all districts of the country. It can be considered representative of the vast online population, and it is believed that the patterns exposed would find strong resonance in the wider population as well.

The survey was conducted during the period of the ‘general holiday’ in Bangladesh which is euphemistically a reference to lockdown. It estimates that 10 percent of the population displayed

COVID-19 type symptoms and 1 percent had comorbidities. We also noted that urban residents, divorcees, and members belonging to large households faced greater risk while higher incomes usually corresponded with reduced risk.

Shocks to income (and expenditure) was substantial, with nearly 50 percent reporting income flows halted for younger age groups while this was about a third for older groups. In terms of coping ability this was seen to be weak, varying as expected with income and education. At the same time, we noted that there was considerable awareness of good practices like handwashing and social distancing. Use of masks was found to be very high while handwashing practices were also seen to be quite encouraging.

The conclusion therefore is that ordinary people were trying hard to fight back but their means were limited. The impact on the labour market was severe – clearly indicating that for a poor country, a longer-term lockdown would be untenable. Therefore, the government decision to avoid a hard lockdown and withdraw the ‘general holiday’ sooner, rather than later, was by far the better option. If public resources and government capacity to distribute food and cash was much better, a different strategy may have been feasible.

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## Appendix

Table A1: Summary statistics for section IV

<b>VARIABLES</b>	<b>(1) N</b>	<b>(2) mean</b>	<b>(3) Sd.</b>	<b>(4) min</b>	<b>(5) max</b>
Age	29,599	36.09	8.109	16	81
Using mask always dummy	29,749	0.944	0.230	0	1
Knowledge on Cough & Sneeze dummy	29,720	0.913	0.281	0	1
Knowledge on Touching surface dummy	29,720	0.788	0.408	0	1
Able to maintain social distance dummy	29,749	0.292	0.455	0	1
Lockdown maintained properly dummy	29,749	0.136	0.343	0	1
Rural area dummy	29,749	0.254	0.435	0	1
Washing hand 7-10 times dummy	29,749	0.484	0.500	0	1
Idea on social distance dummy	29,749	0.00363	0.0601	0	1
Work from home dummy	17,673	0.525	0.499	0	1