Income loss and wellbeing during COVID-19 lockdown in rural Bangladesh: Evidence from large household surveys

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Abstract

We conducted a large household survey immediately after the lockdown was imposed in response to COVID-19 outbreak in Bangladesh. We then followed up a random subset of households to examine the changing circumstances of rural households as the pandemic evolves. We find that nearly 90 percent of these households experienced a negative income shock. Households that had lost their income completely were more worried about their finance and food, while households with no income loss were mostly concerned about the health of their family members. We also find evidence that households where day laborers are the main income earners mostly rely on loans and help from others to cope with the shock. The overall findings suggest that households experiencing severe negative income shocks were less concerned about the health of their family members, which could further exacerbate the COVID-19 situation as the economic crisis has been deepening over time.

Keywords: Income shocks, wellbeing, coping, COVID-19, Bangladesh.

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1. Introduction

The COVID-19 outbreak has changed the world with widespread lockdown and large scale jobs and income losses. Millions of people worldwide, particularly those employed in the informal sectors in the developing countries have lost their jobs and their only source of income. The loss of employment, therefore, appears to be the most immediate economic impact of the crisis. In April 2020, the International Labour Organization (ILO) estimated that about half of the global workforce could experience a decline in working hours and lose their livelihoods while attempting to curb the spread of the disease. These workers have already experienced about 60 percent income reduction within the first few months of the outbreak due to the lockdown, and the situation is only expected to worsen further as the crisis continues. According to the UN agency, millions of enterprises worldwide, particularly those in the hard-hit sectors, risk closure with limited access to savings and credit facilities thereby reducing the chances of reemployment of those who have lost their jobs (United Nations News, 2020). Therefore, by the second quarter of the year (between April-July 2020), according to the ILO estimates, the world has already lost about 400 million full-time jobs with the South Asian countries accounting for a total of 110 million, an increase of about 424% between first quarter and second quarter, and have suffered a 17.9% loss in working hours (International Labour Organization, 2020).

Several studies, since the advent of the pandemic, have focused on estimating the socio-economic effects of the COVID-19 outbreak on the world economy (Adams-Prassl et al., 2020; Ashraf, 2020; Fernandes, 2020; Shah, 2020; Abi-Habib, 2020; Coibion et al., 2020a, b; Cajner et al., 2020). While lockdown and social distancing were necessary for protecting people from this extremely contagious disease, millions experienced job loss due to massive disruption in economic activities worldwide (Ozili et al., 2020). However, people in developing countries, particularly the poor, appeared to have been bearing the manifold burden of COVID-19 on health and economic fronts (Barnett-Howell and Mobarak, 2020; Ravallion, 2020). Understandably, with poor living conditions and often overcrowded living arrangements, the poor had minimum to no means of maintaining social distancing (Brown et al., 2020). Due to closure of business and disruption of economic activities, many of these people experienced either partial or complete loss of income,

which had implications for nutritious and sufficient food intake (Ahmed et al., 2020, Ravallion, 2020), and, thus, for their physical health and immunity.[1]

In this paper, we examine the condition of rural households during lockdown using a large dataset of about 9,847 rural households collected from 423 villages located in the southwestern region of Bangladesh. We investigate the income shocks largely due to the COVID-19 outbreak, and the wellbeing status measured in terms of concerns or worries related to household finance, food, and health of household members. We find that during this health crisis, only about one in three respondents were most worried about their health while the rest were worried about securing food and ensuring income for the family. This concerning evidence poses two questions: i) whether income loss influenced their concern, and ii) what are the different strategies that these rural households are adopting to deal with this crisis.

We find robust evidence that rural households which have lost their incomes either partially or completely are most worried about arranging food and ensuring income for their families and least worried about their health and medical treatment. The effects are found to be significantly higher for households that have lost their incomes completely vis-a-vis those who have experienced only a partial income loss. Similar effects were also found among rural households that experience food insecurity in any form. Households that are experiencing severe food insecurity are more likely to be worried about food and finances compared to those suffering from mild or moderate food insecurity and those that are food secured. Rural households that have lost their incomes completely were found to be using loans and help (from others) relatively more often to manage this crisis while those who experienced partial income loss fell back more on past savings and assets.

The following two sections, Sections 2 and 3, discuss the data that have been used for this paper followed by a detailed discussion of the empirical methodology employed in the paper respectively. Section 4 then presents the results of the paper followed by our concluding remarks in Section 5.

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[1] According to the Bangladesh Economic Association (BEA), in the 66 days of the initial countrywide lockdown in Bangladesh, 36 million of the 61 million people in the labor force lost their jobs. Around 59 million people experienced a negative income shock while 25 million were hit hard by this pandemic, thereby becoming extremely poor (Mahmud, 2020).

2. The Surveys and the Data

We use two survey rounds (wave I and wave II) conducted in April and May 2020 in the southwestern region of Bangladesh. The first wave (wave I) covers a total of 9,847 rural households selected from 423 villages. These households are spread over five subdistricts (Dumuria, Paikgacha, Tala, Assasuni, and Koyra) in two districts (Satkhira and Khulna). They were participants in three previous surveys conducted in 2019. The short telephone surveys were conducted in collaboration with a local NGO, Global Development Research Initiative (GDRI). The first wave of the survey started on April 14, 2020, 19 days after the lockdown ('holiday') had started and ended on May 3, 2020. The second wave was conducted about 3-4 weeks after the first wave. In the second wave, we followed up a randomly selected sub-sample of 2,402 households.

One adult member was selected from every household for the telephone survey that lasted for about 15-20 minutes where we collected data related to income loss, anxiety/worries during the pandemic period, coping strategies, and household food security. All surveys were conducted by trained enumerators, and they had previously surveyed these households for other research projects in the pre-COVID-19 period. Thus, they were familiar with the circumstances of the participants and the people they were talking with over the phone. Data from this survey was merged with detailed socio-economic and demographic data that was collected previously. When compared with the characteristics of the rural household sample of the Household Income and Expenditure Survey (HIES) 2016 (Bangladesh Bureau of Statistics, 2016), our sample households have similar characteristics (see Ahmed et al. 2020 for more details).

Our outcome variable is the anxieties or concerns during the pandemic. We derived the evidence from the responses to the following question: "*What are you most concerned/worried about because of this disease [Coronavirus]?*" where respondents were asked by the enumerators to rank each of the four items: 1) *to arrange food for every family member*; 2) *to find a way to earn money/ensure income for your family*; 3) *family's health and medical treatment;* and, 4) *the financial situation of your relatives/ neighbor*. Respondents were thus asked to assign rank 1 to the item that they were most worried about and 4 to the item that they were least worried about. They were also asked to express how worried they were about each of these concerns on a scale of 1 to 3, where 1 indicates "*not at all worried*", 2 "*somewhat worried*" and 3 "*very worried*".

Households are, therefore, classified as "*worried about food*" if they assigned rank 1 to item (1) i.e. if the response to item (1) is 1 then the dummy "*worried about food*" takes the value 1 and 0 otherwise (for any rank other than 1). Similarly, households are referred to as "*worried about finance*" and "*worried about health*" if the responses to items (2) and (3) are 1, and 0 otherwise.

We focus on three specific categories of income change with responses categorized as: (i) complete income loss; (ii) partial income loss; and, (iii) income unchanged. We broadly categorize the coping strategies of the households into three categories --- namely under (i) asset, (ii) help, and (iii) loan where the a*sset dummy* takes the value 1 if households were using past savings and food already stored at home to cope with the income shock during the pandemic period. *Help* is also a dummy variable based on whether the household receives any help from friends/relatives/neighbors, government, or NGOs. Finally, the variable *Loan* takes the value 1 if the households took recourse to borrow from others to deal with the crisis.

In addition to classifying households based on their change in income, we also use an alternative definition to categorize rural households in terms of their food insecurity status. We follow Ballard et al. (2013) to identify households as mildly food insecure, moderately food insecure, or severely food insecure vis-à-vis being food secured by capturing the responses of the households to the eight questions in the Food Insecurity Experience Scale (FIES). Households were asked if in the past *2-3 weeks* they had experienced any of the eight food-related issues because of any financial difficulties (see Ballard et al. (2013) for details). During wave 1, we asked the following questions to the households using a reference period of the last 2-3 weeks: was there a time when, because of lack of money or other resources: *[1] You were worried about not having enough food to eat?; [2] You were unable to eat healthy and nutritious food?; [3] You ate only a few kinds of foods?; [4] You had to skip a meal?; [5] You ate less than you thought you should?; [6] Your household ran out of food?; [7] You were hungry but did not eat? and [8] You went without eating for a whole day?* Households here are referred to as mildly food insecure if they have responded positively to any of the first three questions: [1]-[3]; moderately food insecure if they responded affirmatively to any of the questions in [4]-[6] and finally, severely food insecure if they have responded positively to either [7] or [8]. Households that did not belong to any of these three categories were referred to as food secure.

3. Empirical Methodology

We examine the correlates of income loss experienced by the households during the pandemic and any instance of anxiety/worry within the household. We begin by estimating the regression model as presented in Equation (1) which directly estimates the coefficient associated with the income loss indicators after controlling for a wide range of individual and household level observable characteristics. We run the following regression:

$$W_{hj} = \alpha_j + \gamma IS_h + \vartheta H_h + \varepsilon_{hj} \quad (1)$$

where, W_{hj} is one of the three anxiety variables (worried about food, finance, or health) of household h in village j. These variables capture the type of anxiety or worry the household experienced at the time of the survey reported in the first wave (referred to as wave-I). IS is the income shock indicator (during wave-I) which picks up whether the main earning member of the household has completely or partially lost their income compared to the pre-COVID-19 period (relative to no-change in income, which is the reference category). We are particularly interested in the sign and magnitude of the coefficient γ associated with the income shock variable IS.

We also control for characteristics such as household size, pre-COVID-19 median income of the household, the religion of the household, whether the household has a migrant worker, gender of the decision-maker in the household, and finally the primary profession of the main earning member of the family (e.g., farmer, farm laborer, day laborer, business, government job, private job, or others). The occupation of the household has been categorized under four distinct sub-heads such as farmer, laborer, self-employed/small business, and professional/salaried job). ε_{hj} is the individual specific error term which is non-systematic in nature and varies across individuals. Finally, each regression includes village-level fixed effects (α_j) to account for village level heterogeneity and unobserved characteristics. We compute clustered–robust standard errors at the village level as villagers share some common characteristics. As a robustness check, we also replace the income shock variables with the food insecurity variables, which captures whether the household has experienced any issues related to availability or access to food in the past *2-3 weeks* because of any financial difficulties. Towards this end, we compare the effect of incidence of mild, moderate, and severe food insecurity.

Next, we examine the different strategies that the households adopted to counter the negative income shocks. In terms of equation (1), we replace the outcome variables with the three coping strategies such as past savings/assets, loans, and help from others. Finally, we combine both wave data to examine the effects of changes in income between wave I and wave II. We estimate the following regression:

$$W_{hj} = \alpha_j + \gamma\Delta IS_h + \vartheta H_h + \epsilon_{hj} \qquad (2)$$

where we replace the outcome variables from wave-I with the three anxiety variables from wave-II; the income shock variable capture the change in income status (ΔIS_h) between waves-I and II. Based on the three income shock status as of wave-I and three income shock status as of wave-II, we categorize the nine (3×3) changes between waves-I and II into three (no change, improvement, and deterioration) and alternatively five (no change, moderate deterioration, severe deterioration, moderate improvement, and complete improvement) detailed income change categories (see Table 6 for a detailed discussion).

Based on this definition, a household experiences *severe deterioration* if the household was unaffected by the outbreak of the pandemic (in terms of income loss) during wave-I but is found to have lost this income completely by wave-II, while *moderate deterioration* refers to those households which changed their income status from partial income loss in wave-I to complete income loss during wave-II or from unaffected during wave-I to partial income loss by wave-II. On the other hand, *complete improvement* means a full recovery of income between wave-I and wave-II, i.e., they had completely lost their income during wave-I but has completely recovered (or has full income/no change relative to pre-COVID-19 period) by wave-II. Similarly, *moderate improvement* means income recovery from complete income loss to partial income loss or from partial income loss to full recovery over the same period. Finally, *no change* refers to those households who did not change their income status between waves-I & II. For the three income change indicators, we simply club severe and moderate deterioration together and complete and moderate improvement together and term them as *deterioration* and *improvement* respectively to increase the precision of the estimates. In all of these cases, *no change* is used as the reference category.

4. Empirical Results

Figure 1 provides a sense of the overall income loss experienced by households within a month of the imposition of lockdown in Bangladesh. We observe about 92% of households experienced partial to complete income loss, and about 56% of households lost their income entirely within about three weeks the lockdown came in effect. Only 8% of households reported no loss of income during this time. A change in the income status of a subsample of 2,402 reveals the dynamics of income change between wave-I and wave-II. Between the two survey waves, the proportion of households earning the same as the pre-COVID-19 period declined by about 2 percentage points while another 2% of households lost their incomes completely. Figure 2 presents differential income loss across several occupation categories during wave-I. Overall, Figure 2 suggests that a large majority of the people lost their income just after the imposition of the lockdown and different occupation groups experienced income loss differently. We find that households which reported (daily wage) laborer as their primary occupation (i.e., day laborers and farm laborers) were hit hardest by the COVID-19 lockdown—nearly two-thirds of day laborers and farm laborers experienced complete income loss, followed by others and then farmers. Figure 2 also indicates that households with a more secured government job were least affected by the pandemic in terms of both complete or partial income loss.

4.1 Determinants of 'anxiety'

Data from wave-I shows a number of concerns ('anxiety') that households reported at the time of the lockdown. It provides a sense of the overall concerns about food, finance, and health issues experienced by rural households due to income loss. In Figure 3, we observe that the households that experienced complete income loss were worried predominantly about their finance (41.6%) followed by health (33%) and food (27.9%). Households that had lost income partially mirror similar patterns, while those able to maintain their pre-COVID-19 income level were predominantly concerned about health. Concern for health over food despite income loss in the first two groups may be explained in relation to the timing of wave-I survey; as the concerns about the virus were unfolding and many people started to panic about how to protect themselves from the virus. Therefore, it is likely that the fear of infection was there. Unsurprisingly, households that were able to maintain the pre-COVID-19 level of income were found to be worried about the

financial circumstances of their relatives (as reflected in worried about 'other issues') more when compared with the other two groups.

Figure 4 presents the distribution of different forms of anxieties/concerns among the respondents by occupation groups. Households that are primarily dependent on daily wage (i.e., farm and non-farm laborers) were mostly concerned about managing food and finance for their families. On the contrary, households with relatively stable occupations such as public or private sector regular jobs were most worried about health. Around 73% of the households, where main income earners have a government job, were mostly worried about the health of their family members during this pandemic. A similar pattern applies to households with a private job as the main source of income. In addition, Figure 5 here presents variations in anxieties by education level of the members of the households. We observe that households with a relatively more educated individual as a family member were more worried about health. This figure shows a clear pattern that households with a more educated member (i.e., those who completed higher degrees) were most worried about health (49%) followed by finance (31%) and food (17%). On the contrary, lower educated households such as those with maximum education level below primary education were most worried about finance (48%) followed by health (30%) and food (22%). Overall, this figure indicates that educated households are more aware and therefore relatively more worried about their own health and the health of their family members and less worried about finance and food, though these results are merely an association between education level and concerns related to the COVID-19 crisis.

The summary statistics of the overall sample are presented in Table 1. The regression results estimated using Equation (1) are presented in Table 2. The results confirm what is evident from Figures 3, 4, and 5. Overall, the results can be summarized as follows: households with job security were worried primarily about health followed by ensuring food for family and managing finances compared to the other occupation categories where income is less secure and more dependent on the daily market conditions. Similarly, households with a member who completed higher degrees were predominantly worried about health followed by finance and food for their families compared to households with lower educated members. Moreover, households that had experienced income loss were more worried about food and finance and less worried about health, with the adverse

effects increasing with the intensity of the income shock suffered, i.e., those with complete income loss were worried more about food/finances than those with partial income loss.

These results are robust to the use of an alternative definition of the shock. Similar results are found when the income shock indicators are replaced with the food insecurity indicators in Equation (1) (Table 3). Exposure to mild to moderate or severe food insecurity within the two to three weeks after the lockdown was imposed appears to be positively correlated with concerns over ensuring food for the family and managing their finance. In contrast, being (relatively) food secured is found to be correlated with being concerned over health and wellbeing.

4.2 Crisis Management

Regarding coping strategies, we find evidence that most households were borrowing money, getting or seeking help from relatives or neighbors, and using their savings (past savings or stock of food grains) to mitigate the negative income shocks experienced due to the crisis. These households have mostly taken recourse to past savings or previously-stored food, followed by borrowing money and help from others as a buffer to deal with the crisis. Figure 6 displays the occupational status of households and their coping strategies. The figure suggests that nearly 45% of laborer households (i.e., those with day laborer or farm laborer as their primary source of income) took loans to deal with the pandemic while 27% were dependent on help from other sources (relatives, neighbors, NGOs/government). The vast majority of the households (about 86%), who relied on daily wage as their income used assets such as previous savings and stored food to deal with the crisis. On the other hand, most of the farmer households (about 94%) also used the same coping strategy, while depending relatively less on help received from relatives or friends, government or NGOs. Households, where the main income earners have a secured job such as a government or a private job are least reliant on help received from others to deal with the pandemic.

Table 4 shows that daily wage laborers are more likely to borrow money, and seek help from relatives, neighbors, NGOs/government compared to those with more secure occupations (i.e., government or private jobs) and less likely to use past savings as a crisis management strategy. Not relying on past savings is potentially due to not having enough savings to fall back on, which

can be linked to the insecure nature of occupation where income may be dependent on current market conditions.

Households that experienced negative shocks in terms of either partial or complete income loss, were using all the three coping strategies. However, those lost their income completely were more likely to take help from others or borrowing, and slightly less likely to use their past savings and assets. On the contrary, households belonging to the above-median income group were more reliant on using their assets to manage the crisis than other coping options. These results hold when income loss is replaced with the food insecurity variables in Table 5. Households that were food insecure were more likely to use loans and getting help from others and are less likely to rely on their past savings, possibly because of lack of such savings (Table 5). While following a similar pattern, the coefficients associated with severe food insecurity are significantly higher in magnitude compared to mild/moderate food insecurity in explaining the determinants of crisis management strategies during the pandemic.

4.3 Dynamics in income shocks

Finally, taking advantage of the follow-up survey, we seek to understand the evolving situation as the lockdown continued. A detailed breakdown of how the incomes of these households changed between waves-I and II is presented in the matrix in Table 6. We consider a transition matrix considering the three categories of income status (complete income loss, partial income loss, and no change) for wave-I and wave-II. Thus, there are nine (3 X 3) cells in total in the matrix to capture the changes in income between the waves. Roughly 29.7% of households that were *"no change"* category in wave-I experienced a severe deterioration in income (from *"no change"* to *"complete income loss"*) while another 31% experienced moderate deterioration (from *"no change"* to *"partial income loss"*). Moreover, 56.8% of the households that were in the *"partial income loss"* category in wave-I roughly experienced a moderate deterioration in income by wave-II, i.e., 475 of 836 households moved to the *"complete income loss"* category in wave-II while only 3.7% of households that reported partial income loss experienced in wave-I an improvement in income by wave-II (31 out of 836 households). In contrast, around 31.9% of households that were in the "*complete income loss*" category in wave-I, experienced a moderate improvement in their income between the waves, i.e., moved to the *"partial income loss"* category. Between the two waves, 1.7% of households recovered their income from complete income loss stage in wave-

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I (complete improvement). The rest of the households (in the diagonal of the matrix) did not change their income status between the two waves. Overall, we observe that only 2.3% of the households experienced full income recovery by wave-II, while 18.73% experienced partial income recovery by wave-II (moved to the *"partial income loss"* category in wave-II from the *"complete income loss"* category as of wave-I). We also observe that 34.5% of households were in the partial income loss category during wave II, with their income declining roughly by 46% in comparison to the pre-covid period.

Figure 7 shows changes in the status of the households between wave I and wave. Households that experienced complete improvement became more worried about health compared to food and finance for their families. A similar pattern can be found for households that experienced moderate improvement between the waves. For instance, in terms of income dynamics, households that experienced moderate improvement were mostly worried about the health of their family members (47%) followed by finance (28%) and food (25%). In contrast, households that experienced moderate or complete deterioration were more worried either about food or finance than health. Households experienced no change in income between the two waves were more worried about food.

Table 7 suggests that compared to those with secured jobs, farmers and those engaged in small businesses or self-employed have experienced a deterioration in income status between the two waves. Compared to those households where the female members make household decisions, households where male members make the household decisions or make decisions jointly, income situation had deteriorated further over time. In terms of different crisis management strategies, access to any of the three strategies has been found to mitigate the negative effects. However, past savings and borrowing money were relatively more effective (compared to help received from others).

Finally, Table 8 presents estimates using Equation (2) where we focus on anxiety/concerns as of wave-II and change in income status between waves. We observe a shift in concerns with improvement in the income situation. Households that had experienced an improvement in income status between the two waves (i.e., either moderate or complete improvement) were most worried about health and less worried about food. Panel A in Table 8 shows that households that experienced an improvement in income situation between wave-I and wave-II were 16.5% less

likely to worry about food and 18.8% more likely to worry about health (relative to the reference group i.e. *no change*). We, however, do not find any significant association with being *worried about finance* and the coefficients associated with the income improvement variables. Panel B confirms this association further with only the positive change (both moderate and complete) appears to be significant statistically with the coefficients related to complete improvement larger than those associated with moderate improvement. Overall, the findings from figure 7 and Table 8 show that households recovered from income loss, compared to those experienced further deterioration, started to think about health (as opposed to food or finance) as the most immediate concern for their family members.

5. Conclusion

As of August 2020, Bangladesh stood out as one of the COVID-19 hotspots in South Asia. The overall results presented in the paper suggest that the sudden advent of the COVID-19 pandemic and a countrywide lockdown as a quick response has left many households without their jobs, and they have experienced a significant loss of income. About 56% of our sample experienced complete income loss while another 36% suffered partial income loss. Without sufficient past savings/assets to fall back on, looking for alternative jobs or other sources of income and managing food for the family seems to be the priorities of these rural households. Our survey evidence also seems to indicate that the financial situation of rural households in Bangladesh was deteriorating over time and households with secured salaried/professional jobs were least likely to experience a deterioration in their income. The results further suggest that as and when the financial situation improved, households are likely to prioritize health concerns, suggesting that worrying about health and taking precautionary measures could be improved with income or food transfers. This calls for immediate policy intervention as it would not be possible for households to prioritize health if they are still worried about managing food and finances for the families. The results from the paper, therefore, suggest that concerted efforts need to be undertaken to deal with the financial situation and the health crisis together rather than as two separate issues.

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Figure 1: Income loss across the two waves
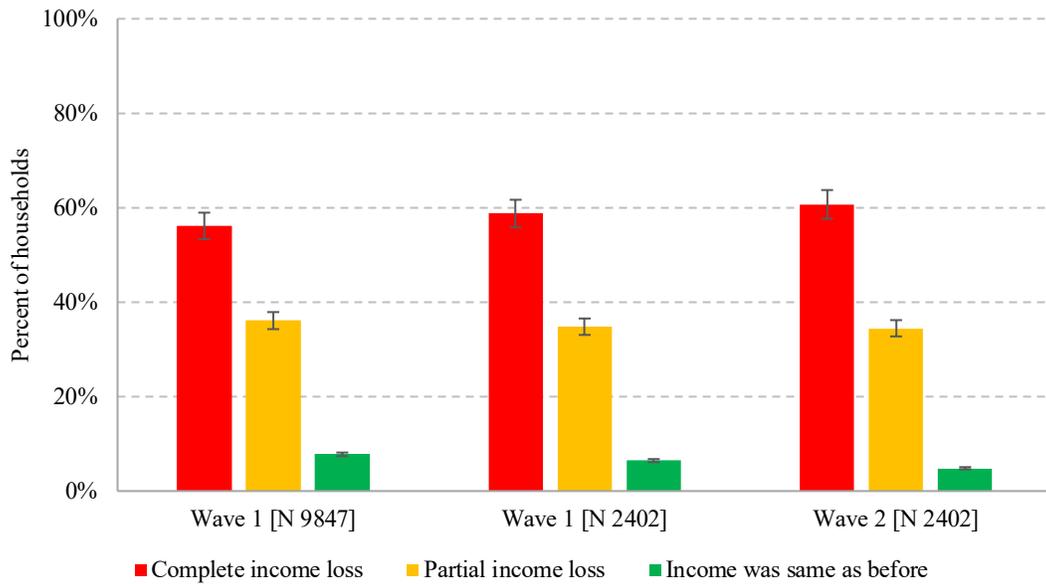
Note: This figure summarizes income loss across the two waves. 'Complete income loss' is an indicator for households that experienced full income loss due to the countrywide lockdown during the COVID-19 pandemic. 'Partial income loss' is a dummy for households that experienced an income loss that is less than 100 percent of their income. 'No change' or 'income was same as before' are dummies for households that did not experience any income loss during this time compared to their income before the COVID-19 pandemic. The survey of wave 1 started on 14 April 2020, 19 days after the lockdown started while the survey for wave 2 was conducted 3-4 weeks after wave 1. Bars with 95% confidence intervals have been reported.

Figure 2: Income loss by occupation status

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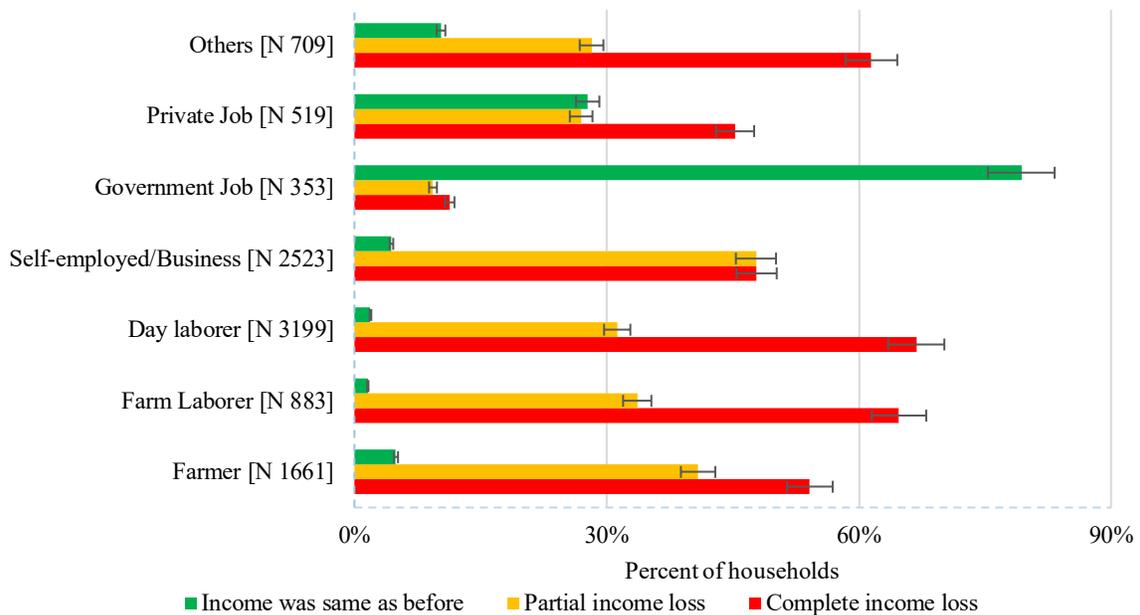
Figure 3: Income loss and anxiety

Worry about other issues | Worry about finance | Worry about food | Worry about health
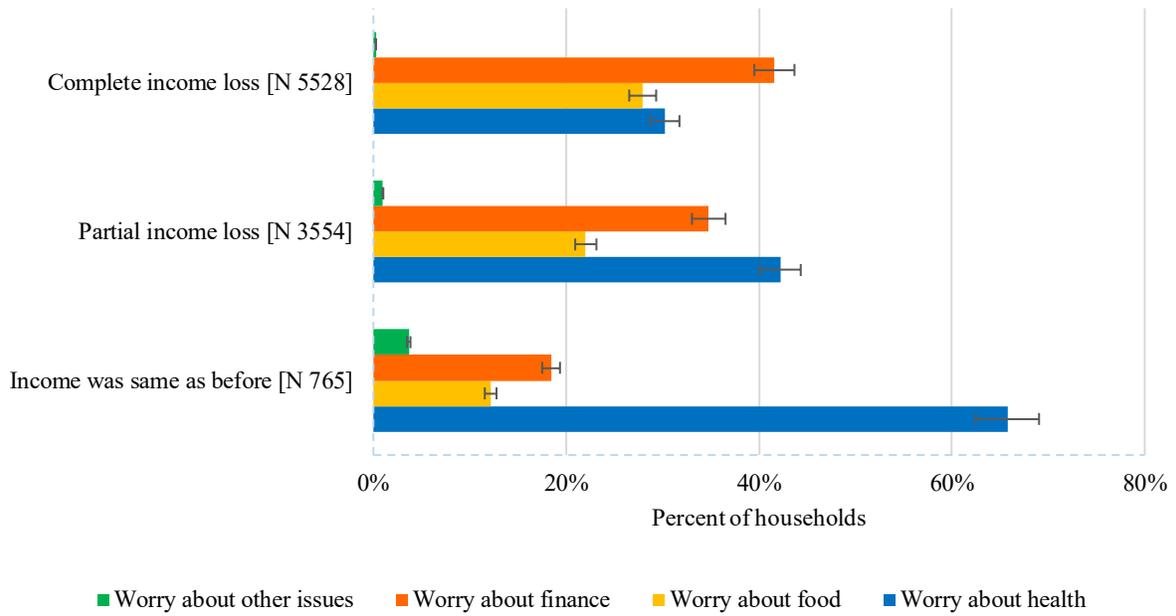
Figure 4: Anxiety by occupation status

Worry about other issues | Worry about finance | Worry about food | Worry about health
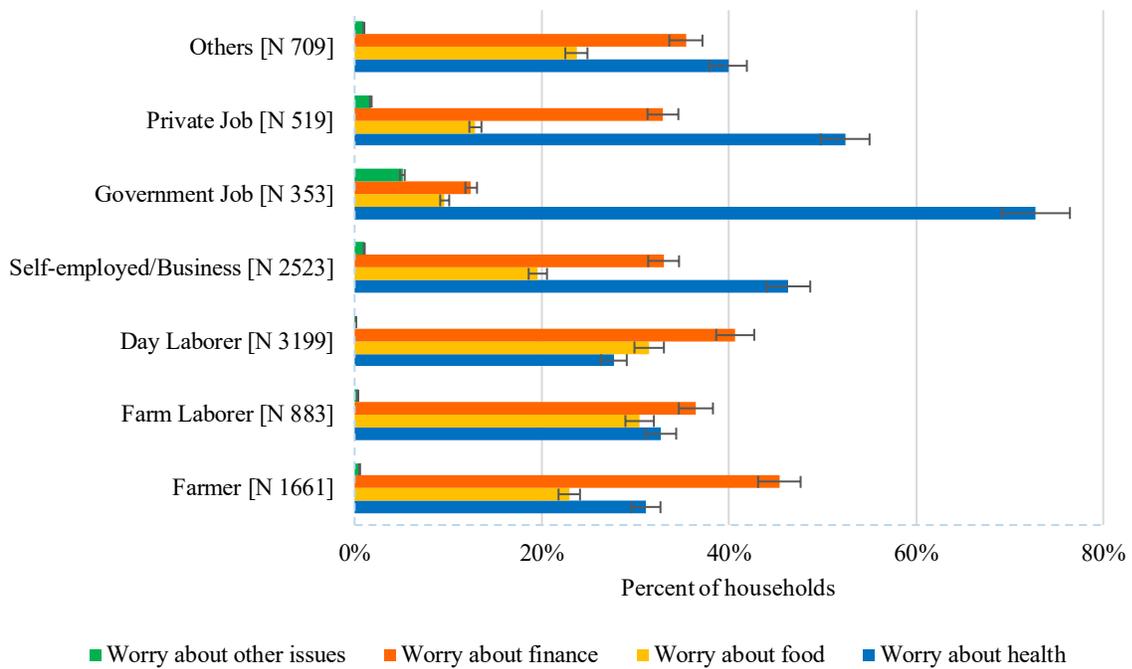
Figure 5: Anxiety by level of education

Worry about other issues · Worry about finance · Worry about food · Worry about health
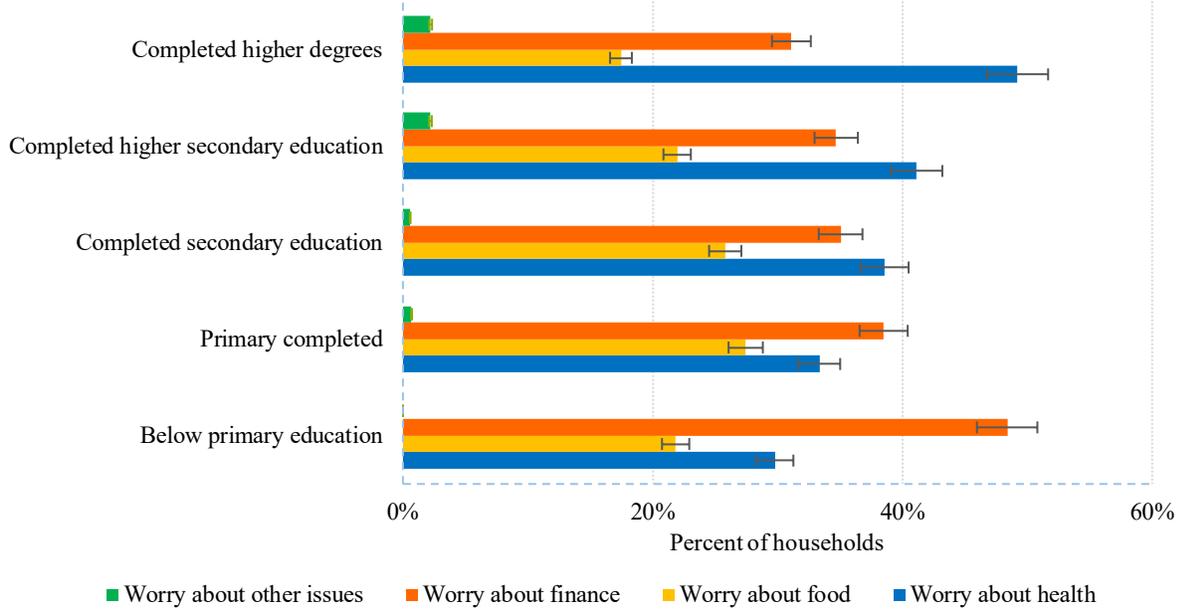
Figure 6: Crisis management by occupation status
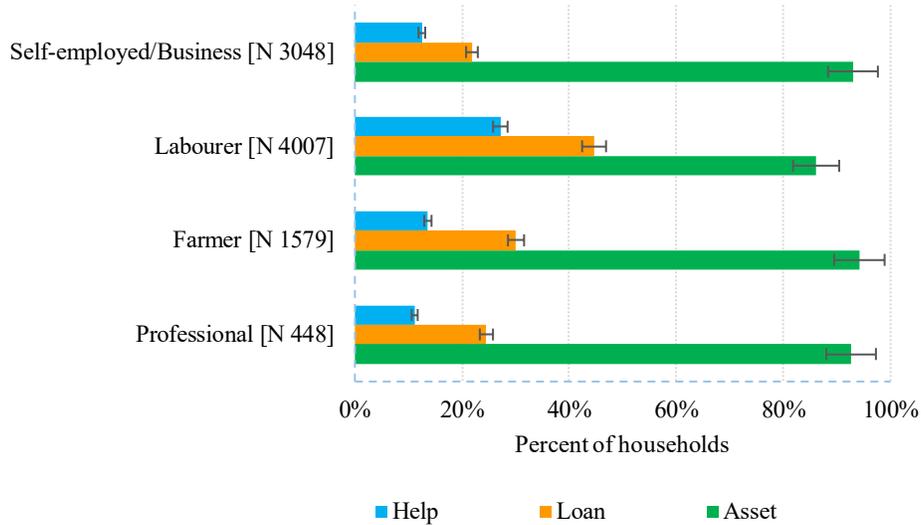
Help · Loan · Asset

Note: We categorized the seven categories of primary occupation of the household head under four distinct sub-heads such as farmer, laborer, self-employed/small business, and professional/salaried job. For examples, both the day laborers and farm laborers are categorized as laborers, small businesses and others are categorized as self-employed/business, both the government and private job are categorized as professional, and farmers.

Figure 7: Income dynamics and Anxiety
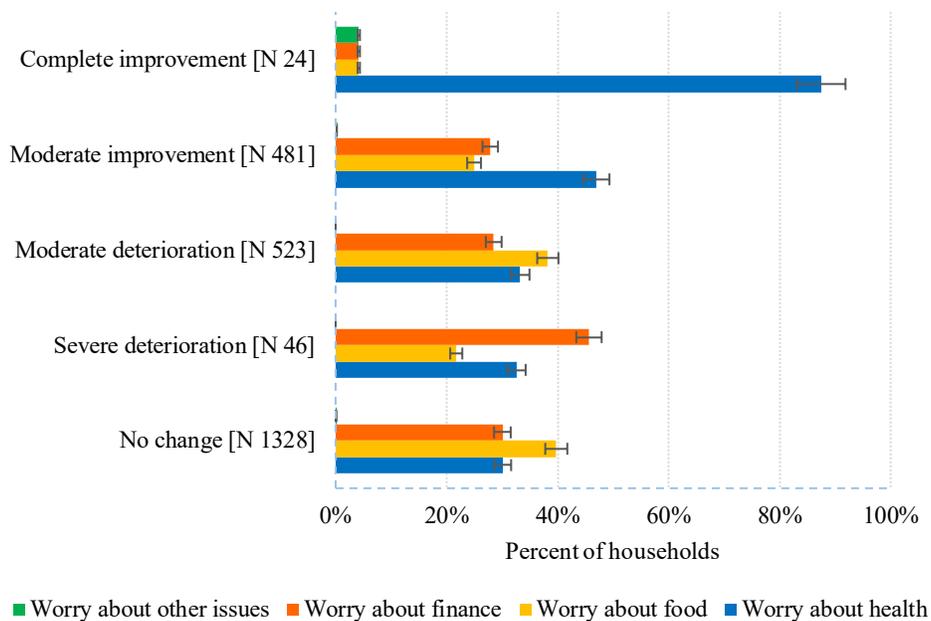
Note: for categories of complete improvement, moderate improvement, moderate deterioration and severe deterioration see notes in Table 6.

Table 1: Summary statistics

Variables of Interest	Mean	Std. Dev.	No of Obs
Panel A: Worry about food, finance, health and other household issues (All sample)			
Worry about food	0.246	0.431	9,847
Worry about finance	0.373	0.484	9,847
Worry about health	0.373	0.484	9,847
Worry about other issues	0.008	0.088	9,847
Panel B: Crisis management strategies (All sample)			
Take help from government or NGOs	0.176	0.381	9,847
Take loan from different sources	0.309	0.462	9,847
Use assets	0.392	0.488	9,847
Panel C: Primary occupation of the main earning member of the household (All sample)			
Farmer	0.169	0.374	9,847
Laborer	0.415	0.493	9,847
Self-employed or small business	0.328	0.470	9,847
Professional	0.089	0.284	9,847
Panel D: Food insecurity (All sample)			
Food secured	0.189	0.392	9,847
Mild to Moderate insecurity	0.746	0.436	9,847
Severe insecurity	0.065	0.247	9,847
Panel E: Income change (All sample)			
Complete income loss	0.561	0.496	9,847
Partial income loss	0.361	0.480	9,847
Income unchanged	0.078	0.268	9,847
Panel F: Religion and migration status (All Sample)			
Households have a migrant member	0.026	0.158	9,847
Religion is Islam	0.711	0.453	9,847
Panel G: Other Household Characteristics (Subsample: collected in 2019)			
Household size	4.351	1.317	8,842
Median income	0.486	0.500	8,842
Age of the respondent	37.223	8.842	8,842
Could not complete primary	0.046	0.209	8,842
Primary completed	0.571	0.495	8,842
Completed secondary education	0.235	0.424	8,842
Completed higher secondary education	0.077	0.267	8,842
Completed higher degrees	0.071	0.257	8,842
Female takes major household decisions	0.153	0.360	8,842
Male takes major household decisions	0.558	0.497	8,842
They jointly make major household decisions	0.284	0.451	8,842
Other member takes major household decision	0.006	0.077	8,842

Note: We categorized the seven categories of primary occupation of the household head under four distinct sub-heads such as farmer, laborer, self-employed/small business, and professional/salaried job. For examples, both the day laborers and farm laborers are categorized as laborers, small businesses and others are categorized as self-employed/business, both the government and private job are categorized as professional, and farmers.

Table 2: Worries about food, finance and health

Variables of Interest	Worried about food	Worried about finance	Worried about health
Farmer (Ref. Professional/salaried job)	0.083***	0.058**	-0.131***
	(0.021)	(0.023)	(0.026)
Laborer	0.148***	0.052**	-0.185***
	(0.019)	(0.021)	(0.025)
Self-employed or small business	0.045***	0.027	-0.067***
	(0.017)	(0.021)	(0.023)
Partial income loss (Ref. No change)	**0.061*** **	**0.086*** **	**-0.126*** **
	(0.019)	**(0.022)**	**(0.025)**
Complete income loss	**0.101*** **	**0.114*** **	**-0.193*** **
	(0.018)	**(0.022)**	**(0.025)**
Households have migrant member	0.005	-0.019	0.012
	(0.031)	(0.027)	(0.031)
Religion is Islam	0.003	-0.002	-0.006
	(0.017)	(0.019)	(0.017)
Median income	0.019	-0.019	0.001
	(0.013)	(0.013)	(0.013)
Age of the respondent	0.000	-0.002**	0.001**
	(0.001)	(0.001)	(0.001)
Primary completed (Ref. Below primary education)	0.037	-0.047*	0.009
	(0.023)	(0.026)	(0.024)
Completed secondary education	0.037	-0.062**	0.028
	(0.025)	(0.028)	(0.026)
Completed higher secondary education	0.034	-0.084***	0.042
	(0.029)	(0.032)	(0.029)
Completed higher degrees	0.010	-0.076**	0.062**
	(0.028)	(0.032)	(0.031)
Household size	-0.000	-0.001	0.002
	(0.004)	(0.004)	(0.004)
Male takes HH decision (Ref. Only Female)	-0.001	-0.011	0.005
	(0.016)	(0.016)	(0.016)
Jointly takes decisions	0.008	-0.013	0.001
	(0.018)	(0.019)	(0.019)
Others take HH decisions	0.023	0.094	-0.121*
	(0.061)	(0.057)	(0.068)
Observations	8,842	8,842	8,842
R-squared	0.172	0.275	0.271

Note: The dependent variables are all dummy variables. Each of the dummies takes value 1 if the households express that the concern for that particular item among the four items (food, finance, health and others) has been the most and 0 if the other items were ranked higher. All regressions also include village fixed effects. Standard errors are clustered at the village level. *** p<0.01, ** p<0.05, * p<0.1

Table 3: Worries about food, finance and health (with food security)

Variables of Interest	Worried about food	Worried about finance	Worried about health
Mild/Moderate insecurity (Ref. Food secured)	**0.098*****	**0.090*****	**-0.171*****
	(0.013)	**(0.013)**	**(0.016)**
Severe insecurity	**0.152*****	**0.074*****	**-0.207*****
	(0.026)	**(0.025)**	**(0.025)**
Observations	8,842	8,842	8,842
R-squared	0.175	0.275	0.276

Note: We also control for the following variables in the regressions: occupation categories, whether the household has a migrant member, religion of the respondent, median income of the household, age (in years), education, household size and who takes decisions in the household (female, male or jointly). Income change variables have been replaced with the food insecurity variables. Standard errors are clustered at the village level. *** p<0.01, ** p<0.05, * p<0.1

Table 4: Determinants of Strategies for Crisis Management

Variables of Interest	Loan	Help	Asset
Farmer (Ref. Professional means salaried job)	0.026	-0.024	0.033
	(0.019)	(0.018)	(0.023)
Laborer	0.143***	0.132***	-0.152***
	(0.019)	(0.018)	(0.021)
Self-employed or small business	-0.027	-0.005	0.009
	(0.017)	(0.015)	(0.019)
Partial income loss (Ref. No change)	**0.160***	**0.139***	**0.548***
	(0.017)	**(0.018)**	**(0.025)**
Complete income loss	**0.329***	**0.158***	**0.456***
	(0.018)	**(0.016)**	**(0.024)**
Households have migrant member	-0.060**	-0.000	0.000
	(0.024)	(0.025)	(0.026)
Religion is Islam	0.029	0.003	-0.018
	(0.018)	(0.017)	(0.018)
Median income	-0.020	-0.028**	0.025**
	(0.012)	(0.011)	(0.012)
Age of the respondent	-0.000	0.001	0.000
	(0.001)	(0.001)	(0.001)
Primary completed (Ref. Below primary education)	-0.040	-0.003	0.030
	(0.027)	(0.021)	(0.020)
Completed secondary education	-0.052*	-0.008	0.035*
	(0.028)	(0.023)	(0.021)
Completed higher secondary education	-0.061**	-0.022	0.041*
	(0.031)	(0.024)	(0.024)
Completed higher degrees	-0.053*	-0.014	0.030
	(0.031)	(0.025)	(0.026)
Household size	0.003	0.002	-0.002
	(0.003)	(0.003)	(0.003)
Male takes HH decision (Ref. Only Female take decision)	0.009	0.005	0.010
	(0.014)	(0.012)	(0.013)
Jointly takes decisions	0.030*	0.013	-0.008
	(0.017)	(0.014)	(0.016)
Others take HH decisions	-0.021	0.002	0.067
	(0.045)	(0.066)	(0.066)
Observations	8,842	8,842	8,842
R-squared	0.300	0.191	0.420

Note: The dependent variable – *loan* is a dummy where 1 indicates that the households have taken loans from several sources during this crisis as a mitigating strategy and 0 means use of other strategies e.g. help from govt./NGOs/relatives/neighbors or use of asset. Similarly, *Help* is a dummy where 1 means the household received help from govt./NGOs/relatives/neighbors and 0 means use of other strategies. Finally, the asset dummy takes the value 1 if the household has used past savings and stock of food grains as a crisis management strategy and 0 otherwise. Standard errors are clustered at the village level. *** p<0.01, ** p<0.05, * p<0.

Table 5: Determinants of Strategies for Crisis Management (with food security)

Variables of Interest	Loan	Help from others	Asset
Mild to Moderate insecurity (Ref. Food secured)	**0.235*****	**0.077*****	**-0.099*****
	(0.015)	**(0.012)**	**(0.019)**
Severe insecurity	**0.386*****	**0.204*****	**-0.250*****
	(0.025)	**(0.024)**	**(0.025)**
Observations	8,842	8,842	8,842
R-squared	0.296	0.195	0.373

Note: See footnote of Table 3. Income change variables have been replaced with the food insecurity variables. Standard errors are clustered at the village level. *** p<0.01, ** p<0.05, * p<0.1

Table 6: Improvement and Deterioration in status during the COVID-19 period

Incidence of income loss in wave 1 (relative to pre-Covid period)	Incidence of income loss in wave 2 (relative to pre-Covid period)			
	Complete income loss	Partial income loss	No change	Total (%)
Complete income loss	937 (39.01%) (No change)	450 (18.73%) (Moderate improvement)	24 (1.00%) (Complete improvement)	1411 (58.74%)
Partial income loss	475 (19.78%) (Moderate deterioration)	330 (13.74%) (No change)	31 (1.29%) (Moderate improvement)	836 (34.80%)
No change	46 (1.91%) (Severe deterioration)	48 (2.00%) (Moderate deterioration)	61 (2.54%) (No change)	155 (6.45%)
Total (%)	1458 (60.70%)	828 (34.47%)	116 (4.83%)	

Note: Severe deterioration refers to households that have lost their income completely by wave-II but were unaffected in wave-I, moderate deterioration means households have lost their full income in wave-II from partial income loss in wave-I or households lost their income partially by wave-II but were unaffected in wave-I. Complete improvement means full recovery of income between wave-I and wave-II i.e. they had completely lost their income during wave-I but has completely recovered (or has full income) by wave-II. Moderate improvement means income recovery from complete income loss to partial income loss over the period or from partial income loss to full recovery over the time. No change refers to households who did not change their status between waves I & II. We put the share in total sample (2,402) in the brackets next to the numbers in each cell in the matrix.

Table 7: Dynamics of income change

Variables of Interest	Income change	Deterioration	Improvement
Farmer (Ref. Professional means salaried job)	0.134**	0.139***	-0.005
	(0.052)	(0.042)	(0.041)
Laborer	0.069	0.066*	0.002
	(0.051)	(0.040)	(0.039)
Self-employed or small business	0.105**	0.122***	-0.017
	(0.049)	(0.039)	(0.039)
Households have migrant member	-0.014	0.031	-0.045
	(0.063)	(0.059)	(0.048)
Religion is Islam	-0.027	-0.046**	0.019
	(0.024)	(0.022)	(0.021)
Median income	0.001	0.020	-0.019
	(0.024)	(0.021)	(0.019)
Age of the respondent	0.001	0.002**	-0.002
	(0.001)	(0.001)	(0.001)
Primary completed (Ref. Below primary education)	0.039	-0.033	0.072**
	(0.046)	(0.044)	(0.034)
Completed secondary education	0.010	-0.038	0.048
	(0.050)	(0.048)	(0.037)
Completed higher secondary education	-0.017	-0.063	0.046
	(0.057)	(0.052)	(0.046)
Completed higher degrees	0.065	-0.010	0.075
	(0.063)	(0.057)	(0.050)
Household size	0.004	0.003	0.001
	(0.008)	(0.007)	(0.006)
Male takes HH decision (Ref. Only Female)	0.012	0.053**	-0.041
	(0.030)	(0.026)	(0.028)
Jointly takes decisions	0.057*	0.058**	-0.001
	(0.034)	(0.029)	(0.031)
Others take HH decisions	-0.266**	-0.125	-0.141
	(0.121)	(0.078)	(0.105)
Crisis management strategies			
Loan taken	-0.082***	-0.171***	0.089***
	(0.025)	(0.019)	(0.022)
Help from govt./NGOs/relatives/neighbors	-0.003	-0.062**	0.059**
	(0.032)	(0.026)	(0.025)
Using assets (savings)	-0.053*	-0.153***	0.100***
	(0.032)	(0.029)	(0.024)
Fairly manageable (Ref. not manageable)*	0.063***	-0.046**	0.108***
	(0.024)	(0.021)	(0.019)
Very easily manageable	0.134**	-0.174***	0.308***
	(0.052)	(0.034)	(0.047)
Self-sufficient/no help required	0.043	-0.129***	0.172***
	(0.043)	(0.029)	(0.037)
Observations	2,151	2,151	2,151

R-squared	0.021	0.073	0.063

Note: See footnote of Table 3. The first dependent variable – "income change" is a dummy where 1 indicates that the households have experienced an change in their income, either deterioration/improvement (partial/full) during wave-II relative to wave-I and 0 means "no change" that refers to households that did experience income change between waves I & II. The second dependent variable – "deterioration" is a dummy where 1 indicates that the households experienced moderate/complete deterioration in wave-II compared to wave-I and 0 means improvement/no change. Finally, the variable – "improvement" dummy takes the value 1 if the households experienced complete/partial improvement and 0 means no change/deterioration. Variables in this table with * corresponds the household's capacity to manage a certain amount during this crisis. They were asked is it manageable for them BDT 2000 by borrowing from others within seven (7) days. Standard errors are clustered at the village level. *** p<0.01, ** p<0.05, * p<0.1

Table 8: Anxiety and Income dynamics

Panel A: Income change	Worry about food	Worry about finance	Worry about health
Deterioration (Ref: No change)	-0.006	-0.023	0.029
	(0.032)	(0.030)	(0.028)
Improvement	**-0.165***	-0.027	**0.188***
	(0.031)	(0.030)	**(0.031)**
Observations	2,151	2,151	2,151
R-squared	0.294	0.321	0.319
Panel B: Detailed Income change			
Severe deterioration (Ref: No change)	-0.080	0.097	-0.018
	(0.081)	(0.094)	(0.093)
Moderate deterioration	0.000	-0.033	0.033
	(0.032)	(0.030)	(0.029)
Moderate improvement	**-0.160***	-0.021	**0.179***
	(0.032)	(0.031)	**(0.032)**
Complete improvement	**-0.307***	-0.157	**0.408***
	(0.088)	(0.102)	**(0.120)**
Observations	2,151	2,151	2,151
R-squared	0.295	0.323	0.321

Note: See footnote of Tables 3, 6 & 7. *** p<0.01, ** p<0.05, * p<0.1