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Towards shock-responsive social protection: lessons from the COVID-19 response in Bangladesh- Estimates from the microsimulation

Research Report

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Oxford Policy Management

About Maintains

This five-year (2018–2023) operational research programme is building a strong evidence base on how health, education, nutrition, and social protection systems can respond more quickly, reliably, and effectively to changing needs during and after shocks, whilst also maintaining existing services. Maintains is working in six focal countries—Bangladesh, Ethiopia, Kenya, Pakistan, Sierra Leone, and Uganda—undertaking research to build evidence and providing technical assistance to support practical implementation. Lessons from this work will be used to inform policy and practice at both national and global levels.

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Executive summary

This report presents the methodology and results of a microsimulation based on a partial equilibrium modelling framework using nationally representative household-level data for Bangladesh. The findings include an estimate of the potential impact of COVID-19 on poverty in the country based on a model that assumes heterogeneity of impact across individuals and households depending on the type and sector of employment. Moreover, the model is used to assess the effectiveness, coverage, and adequacy of the social protection response to COVID-19. The microsimulation results complement a larger Bangladesh country case study, which will be available on the Maintains website together with a policy brief on the key findings.

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List of abbreviations

BDT	Bangladeshi Taka
BIGD	Brac Institute for Governance and Development
CPI	Consumer price index
DA	Allowances for the financially insolvent disabled
FCDO	UK Foreign, Commonwealth and Development Office
FDI	Foreign direct investment
GDP	Gross domestic product
HIES	Household Income and Expenditure Survey
IMF	International Monetary Fund
ISIC	International Standard Industrial Classification of All Economic Activities
Maintains	Maintaining Essential Services After Natural Disasters
NID	National identity
OAA	Old age allowance
PP	Percentage point
PPI	Producer price index
PPRC	Power and Participation Research Centre
RMG	Ready-Made Garment
WA	Allowances for widows, deserted and destitute women

1 Introduction

1.1 COVID-19 in Bangladesh

This case study is part of the Maintains series Towards shock-responsive social protection, a study on how social protection systems were used in the COVID-19 response to inform investments in shock-responsive social protection systems going forward.

Bangladesh confirmed the first case of COVID-19 on 8 March 2020. By 19 October 2020, the total number of confirmed COVID-19 cases in the country was 390,206, which is equivalent to 2,362 per million population. The case fatality rate stands at 1.46%. There is high geographical concentration of the disease, with 64% of cases arising from Dhaka division.

To contain the outbreak, the Government of Bangladesh declared a 10-day nationwide holiday on 23 March. The general holiday was extended several times throughout April and May and officially ceased on 30 May 2020. During the general holiday or lockdown, all public and private offices were ordered to be closed, with the exception of emergency services. Public transport was very limited, and inter-district public transport was closed. 290 teams of soldiers were deployed across the country to ensure social distancing and other shut-down measures. In spite of the prohibitions on movement, the lockdown led to mass return migration from urban areas; households' urban to rural migration rose from 6% at the beginning of April to 13% between April and June 2020 (PPRC & BIGD, 2020). The final set of restrictions on public movement were officially lifted on 1 September. Schools, however, continue to be closed and are not expected to re-open before the end of 2020. Overall, Bangladesh recorded one of the more stringent lockdowns across the globe, ranging between 80 and 90 on the Oxford COVID-19 Government Stringency Index between April and September 2020.[1]

Beyond the effects of the lockdown, Bangladesh is impacted by the crisis through two main channels: the global recession effect through trade, FDI, and remittances, and a combination of weak demand and supply-side shocks within the domestic economy. As a result, the country's GDP growth, which was projected at 7.5% pre-pandemic, is now projected to be 3.8%, with gradual recovery expected only from the second quarter of 2021 (International Monetary Fund (IMF), 2020). This would represent the largest one-year decline in the last three decades.

Exports are expected to see one of the worst contractions in the recent past; in April/May they were at just 29% of the volume recorded in the same period in 2019. The worst hit to the economy came through the Ready-Made Garment (RMG) industry. It was estimated as at 26 June that about 2,000 global brands had cancelled or were likely to cancel orders worth US$ 3.7 billion from Bangladeshi garment factories. Earnings from the sector have declined by 18% in 2019/20 from 2018/19 and 2 million workers in the RMG sector as well

[1] See https://covidtracker.bsg.ox.ac.uk/

as 4 million people employed in allied sectors are expected to be impacted as a result (PPRC & BIGD, 2020).

Remittances between January and July 2020 are expected to be at 70–80% of the volumes recorded during the same period in 2019. The general contraction in the economy is compounded by increasing inflation; a rise in the inflation rate has been observed since the start of 2020, with inflation over the 5.5 year-on-year target. Of particular concern is that the increase in prices is at least partially due to an increase in the price of food items. An increase in the price of basic commodities was also observed through price monitoring.

A PPRC/BIGD survey, undertaken in April 2020, found that people of all population segments incurred a significant income loss, with the poor being hit the hardest and suffering a 75% loss in income on average between February and April. Informal sector workers, who constitute more than 85% of the labour force (Raihan, 2020), are likely to be among the most affected. The second round of the PPCR/BGD survey undertaken in June/July 2020 suggests that between February and June income dropped on average by 40% among the population below the upper poverty line and 34% for the extreme poor (PPRC & BIGD, 2020).

This report presents the methodology and the results of a microsimulation based on a partial equilibrium modelling framework using nationally representative household-level data. The findings include an estimate of the potential impact of COVID-19 on poverty in Bangladesh based on a model that assumes heterogeneity of impact across individuals and households depending on the type and sector of employment. Moreover, the model is used to assess the effectiveness, coverage, and adequacy of the social protection response to COVID-19.

1.2 This report

This report presents the results of a microsimulation for Bangladesh that was implemented based on a partial equilibrium modelling framework using nationally representative household-level data. The findings from the microsimulation include: an estimate of the potential impact of COVID-19 on poverty in Bangladesh, based on a model that assumes heterogeneity of impact across individuals and households, depending on the type and sector of employment; and an assessment, based on the model, of the effectiveness, coverage, and adequacy of the social protection response to COVID-19.

2 Methodology

2.1 Channels of impact

Economic hardship experienced by families because of the global pandemic and resulting economic downturn is expected to increase poverty, especially among more vulnerable groups like children. In the short term, households will be affected by the shock through multiple channels: income from labour is likely to decrease because of direct health consequences as well as reduced economic activity due to quarantine measures and the global recession. Furthermore, non-labour income in the form of remittances and public transfers is likely to change, consumption expenditure will be affected by price changes and possibly shortages of some goods as well as by a rise in out-of-pocket expenditure, and service disruptions (e.g. suspension of education services, reduction of public transportation, saturation of the health system, etc.) are likely to negatively affect monetary welfare dimensions (World Bank, 2020a).

Our approach considers two main short-term impact channels on household welfare: income and prices. Employment income can be completely lost due to loss of employment, or wages can be reduced due to lower economic activity.[2] In addition, income from self-employment (including from own-account farming and household businesses) can be affected to various degrees depending on the sector. Non-labour income may also be affected through changes in remittances in response to COVID-19. The change in economic activity may alter the supply and demand of different goods or services, leading to price changes. The impact of inflation, especially food inflation, on consumption expenditure is therefore modelled.

2.2 Approach

To assess the adequacy, coverage, and comprehensiveness of the response, we conducted a microsimulation based on a partial equilibrium modelling framework using nationally representative household-level data. To do this, we simulated the impact of the pandemic on poverty and inequality as well as the effect of social protection policies that can mitigate negative effects on people's wellbeing. The post-COVID-19 and post-social protection measures scenarios are compared to a pre-COVID-19 baseline scenario, which estimates the expected poverty and consumption level in the absence of the pandemic.

2.2.1 Baseline scenario

To obtain income and consumption estimates that reflect the situation in Bangladesh in 2020 before the impact of COVID-19, the 2016 Household Income and Expenditure Survey (HIES) data is adjusted in two ways. First, sampling weights are adjusted to reflect the growth in population and urbanisation between 2016 and 2020 based on population growth projections by area of residence (see Table 16 in Annex A). Having a dataset that reflects

[2] The direct negative impact of the pandemic on employment income through illness is not considered. Similarly, the impact of higher out-of-pocket expenditure because of illness is not modelled.

population size in 2020 will allow us to directly simulate implemented policy interventions based on actual or expected coverage.

Second, household-level employment and business income by sector is increased with a pass-through rate of 0.8 based on estimated real *per capita* GDP growth by sector between 2016/17 and 2020, where for 2020 we used pre-COVID-19 growth projections (see Table 17 in Annex A). Real income growth is then fully passed on to the share of nominal consumption expenditure that does not come from own production, whereas the latter is assumed to be constant over time.

2.2.2 COVID-19 impact scenarios

Given the level of uncertainty surrounding the actual impact of COVID-19 on employment income and remittances, we have modelled three impact scenarios with different levels of impact. The 'short-term' impact scenario adopts the most dramatic assumption on the impact of the pandemic based on expected impact of lockdown and restriction measures and on likely impact on the most affected sectors of the economy. The 'transition' scenario mitigates the impact parameters, assuming that over time some of the negative effect of the pandemic will fade. Finally, the 'recovery' scenario adopts the most optimistic set of assumptions to model a situation where the impact of the pandemic has almost faded away.

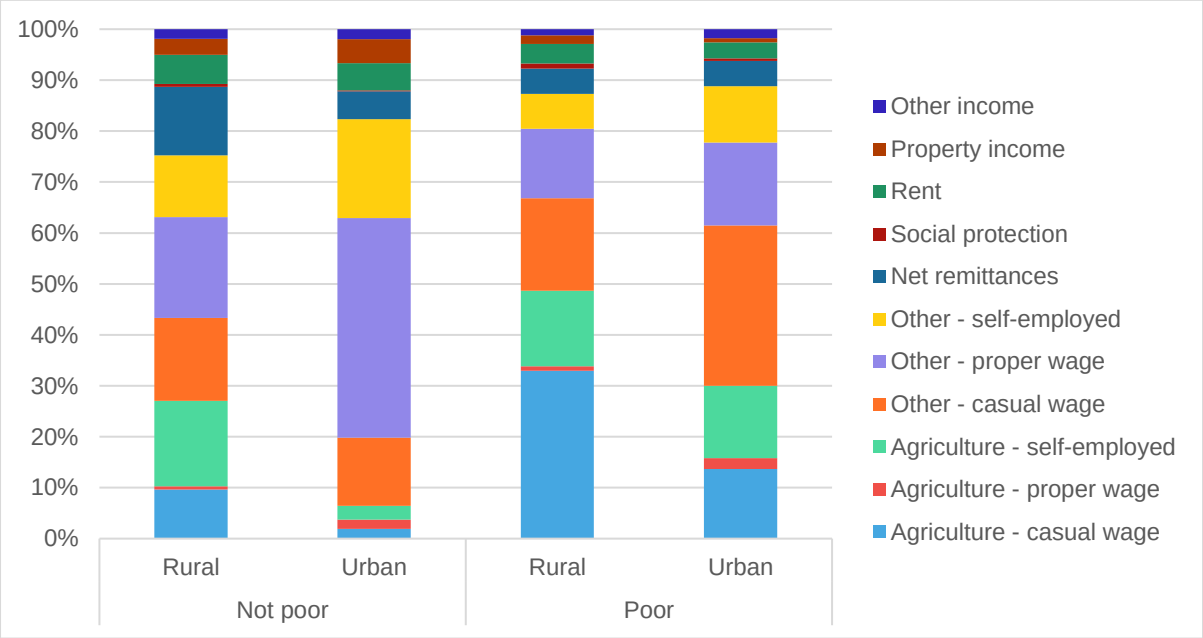
Assumptions on the level of price and income changes were based on available sector-level GDP projections, estimates from a household-level COVID-19 impact mobile survey, type of containment measures (i.e. stringency of lockdowns), and available information on changes in prices.

Income impact channel

Household income is impacted through a decrease in the level of remittances received and through a shock to employment and/or business income received by each household member. The latter is the result of an unemployment effect for a certain percentage of individuals who lose all their income, and a reduced income effect for all the workers who do not become unemployed and for those who are self-employed or own a business. The size of the employment and business loss depends on the sub-sector of employment (for which we use BISIC codes)[3] and on the nature of the employment, i.e. casual, permanent,[4] or self-employment/household business. In terms of understanding the possible impact of COVID-19, it is useful to assess what the main income sources of the poor were at baseline. This is provided in Figure 1.

[3] BISIC codes are a special version of the International Standard Industrial Classification of All Economic Activities (ISIC) codes elaborated by the Bangladesh Bureau of Statistics.
[4] Workers are classified as casual or permanent based on questions 7 and 8 in section 4 on employment status: when they report being a 'day labourer in or outside agriculture' they are classified as casual; when they report being 'employees or employers' they are classified as permanent.

Figure 1: Income sources across geographical areas and level of poverty, 2020



Shock on employment of employees:

- U_C% of casual wage workers and U_p% of permanent wage workers in sector of employment *s* become unemployed and suffer a 100% wage income loss during a period *t*. Typically $U_p > U_c$.
- The unemployment shock is randomly assigned across permanent and casual waged workers within sector *s*. Results are obtained repeating the random selection process 100 times and obtaining the average estimate. This is done to ensure that results are robust and more representative.

Shock on wage incomes of employees and self-employed:

- All remaining (1- U_c)% casual workers and (1- U_p)% permanent workers lose W_c% and W_p% of their pre-crisis wage incomes, as a result of the COVID-19 crisis during a period *t*.
- To capture heterogeneity, the percentage of wage income loss is modelled as a normal distribution.

Shock on household's business income:

- Business income in sector s is reduced by Δ_B%.
- While business income from agricultural production can be affected by the pandemic, agricultural production used for own consumption is assumed not to be impacted by the crisis.

These individual earnings effects are then summed to the household level. Table 1 and Table 2 list the parameters used for the microsimulations for employment income drop and business income drop respectively. The probability of unemployment and percentage of employment income loss are higher among casual workers than among permanent workers

across all scenarios. Business income reductions are assumed to be equal to the drop in earnings of casual workers in any given sector.

Workers in manufacturing and construction are assumed to be the most affected by the pandemic, followed by those in the accommodation and entertainment sector, in the education sector, and service sector more in general. On the other hand, the public sector (public administration and human health activities), the 'financial' sector, and the 'real estate' sector are assumed to be the least affected by the crisis. The assumptions on the size of income drop and unemployment probability are based on PPCR/BIGD's findings from two rounds of the rapid response survey on the economic consequences and response to COVID-19, on the Bangladesh government's GDP growth forecast by sector, and on the Bangladesh economic update (World Bank, 2020b).

Table 1: Assumptions regarding percentage drops in casual and permanent employment income

Sub-sector	Short term				Transition				Recovery			
	U_C	U_P	W_C	W_P	U_C	U_P	W_C	W_P	U_C	U_P	W_C	W_P
Agriculture, forestry, and fishing	5	10	10	20	5	10	5	10	2.5	5	2.5	5
Mining and quarrying	10	20	20	40	10	20	10	20	10	10	5	10
Manufacturing	20	30	20	40	20	30	10	20	10	15	5	10
Electricity, gas, steam, and conditioning	10	20	15	30	10	20	7.5	15	10	10	3.75	7.5
Water supply, sewerage, and waste management	N/R	20	15	30	N/R				N/R	N/R		
Construction	20	30	20	40	20	30	10	20	20	30	10	20
Wholesale and retail trade; repair of vehicles, and personal and household goods	10	20	15	30	10	20	7.5	15	10	20	7.5	15
Transportation and storage	10	20	10	20	10	20	5	10	10	20	5	10
Accommodation and food service activities	10	20	20	40	10	20	10	20	10	20	10	20
Information and communication	N/R	N/R	5	10	N/R	N/R	2.5	5	N/R	N/R	0	2.5
Financial and insurance activities	5	10	5	10	5	10	2.5	5	0	5	0	2.5
Real estate activities	5	10	5	10	5	10	2.5	5	5	5	0	2.5
Professional, scientific, and technical	N/R	N/R	5	10	N/R	N/R	2.5	5	N/R	N/R	0	2.5
Public administration and defence	5	10	5	10	5	10	2.5	5	0	5	0	2.5
Education	10	20	20	40	10	20	10	20	5	10	5	10
Human health and social work activities	5	10	5	10	5	10	2.5	5	2.5	5	0	2.5
Arts, entertainment, and recreation	10	20	20	40	10	20	10	20	10	10	5	10
Other service activities	10	20	20	40	10	20	10	20	5	10	5	10
Activities of households as employers	10	20	15	30	10	20	7.5	15	5	10	3.75	7.5
Drainage and sewerage	10	20	15	30	10	20	7.5	15	5	10	3.75	7.5

Note: N/R means that only an insignificant number of workers work in the sub-sector.

Table 2: Assumptions regarding percentage drops in business income (Δ_B)

Sub-sector	% of self-employed individuals	Short term	Transition	Recovery
Agriculture, forestry, and fishing	68.85	10	5	0
Mining and quarrying	0.04	40	20	10
Manufacturing	5.68	40	20	10
Electricity, gas, steam, and conditioning	0.16	30	15	7.5
Water supply, sewerage, and waste management	0.01	30	15	7.5
Construction	1.45	40	20	10
Wholesale and retail trade; repair of motor vehicles, motorcycles, and personal and household goods	1.98	30	15	7.5
Transportation and storage	3.72	20	10	5.0
Accommodation and food service activities	0.76	40	20	10
Information and communication	0.08	10	5	5
Financial and insurance activities	0.41	10	5	5
Real estate activities	0.21	10	5	5
Professional, scientific, and technical	0.00	10	5	5
Public administration and defence	0.30	10	5	5
Education	0.26	40	20	10
Human health and social work activities	1.00	10	5	5
Arts, entertainment, and recreation	0.17	40	20	10
Other service activities	14.87	40	20	10
Activities of households as employers	0.01	30	15	7.5
Drainage and sewerage	0.02	30	15	7.5

Shock on remittances:

Table 3 summarises our assumptions on the drop in remittances under the three modelled scenarios. In the short-term scenario, remittances are assumed to drop 30% on an annual basis. This is based on the estimated worst-case scenario remittance drop of 27.8% by the Asian Development Bank (2020). In the transition scenario, we assumed that both domestic and foreign remittances will increase to 80% of their pre-crisis. Finally, under the recovery scenario cash and in-kind remittances are assumed to be at 90% of their original level.

Table 3: Assumption on percentage drop in remittances, by scenario

Type	Short term	Transition	Recovery
Domestic – Cash/in-kind	30%	20%	10%
Foreign – Cash/in-kind	30%	20%	10%

Shock on other income sources:

- Other income sources (pension, public transfers, etc.) are assumed to stay constant.

Employment and other income shocks are aggregated to obtain a revised total household-level income estimate and percentage income drop estimate. Given that income data does not correspond perfectly to consumption, the assumption here is that income shocks translate into consumption linearly for the part of consumption that does not come from own production, while consumption expenditure from own production is assumed to be constant.

Price impact channel

A household-specific food and non-food items price index that captures inflation due to COVID-19 is used to estimate the differential impact of the projected price increases on the purchasing power of households, depending on household-specific consumption patterns. For instance, poor households tend to have a larger share of food consumption and are therefore proportionally more affected by changes in food prices. Consumption expenditure from own production is not deflated as it is assumed to be immune to the impact of price changes. In addition, we used disaggregated Consumer Price Index (CPI) data for rural and urban areas to account for the differential impacts of the crisis across areas.

To construct the baseline scenario, we deflated household-level consumption by multiplying household-level consumption within each category by the ratio between CPI inflation between 2016 and 2020 pre-COVID-19 and CPI inflation 2016 and 2020 post-COVID. CPI inflation post-COVID-19 is computed assuming that prices change linearly with respect to the observed CPI between January and August 2020 (see Table 4). CPI inflation in the absence of the pandemic shock are computed assuming that CPI inflation between 2019 and 2020 would have been the same as CPI inflation between 2018 and 2019. As we can see from Table 4, the pandemic is having an inflationary impact on food prices mainly, whereas non-food prices have been declining.

Table 4: Assumption on CPI inflation by area type of good (2016–2020)

Type	Baseline [a]	Short- term / transition [b]	Recovery [c]
Rural – all	0.896	0.896	0.945
Rural – food	0.873	0.873	0.926
Rural – non-food	0.939	0.939	0.980
Urban – all	0.893	0.893	0.925
Urban – food	0.870	0.870	0.906
Urban – non-food	0.920	0.920	0.947

Notes: [a] Observed CPI inflation trend between 2016 and 2019 and assumed linear trend between 2018/19 and 2019/20. [b] Observed CPI inflation up to September 2020. [c] Average between baseline and short-term/transition inflation trends.

Poverty estimation

Based on the estimated post-COVID-19 consumption expenditure, revised headcount poverty rate and poverty gaps are estimated using as poverty lines:

- The monthly upper national absolute poverty line *per capita* (BDT 2,273 in 2016);
- The middle-income class poverty line of US$ 3.20 (2011 PPI) *per capita* per day; and
- The lower middle-income class poverty line of US$ 1.90 (2011 PPI) *per capita* per day.[5]

Headcount poverty and poverty gaps ex-post COVID-19 are compared with the equivalent estimates at baseline, i.e. pre-COVID. Focusing on the national absolute poverty line only, we also compute headcount poverty by rural/urban location and by division, as well as looking at the expected increase in poverty by a set of household characteristics (i.e. household size, presence of members with a disability, sex and age of household head, head employment status, and sector of employment).

In addition, we conduct some analysis of households that fall into poverty because of COVID-19. For those we estimate:

- the number of individuals that become poor because of COVID-19, i.e. they lived in households that are above the national poverty line at baseline and below it post-shock;
- the average amount and percentage loss of consumption because of COVID-19; and
- the average shortfall from the poverty line for households that fall into poverty because of COVID-19 and for those that become poorer because of COVID-19.

2.2.3 Social protection impact scenarios

We used the three post-COVID-19 scenarios to further simulate the mitigating effects of the most relevant cash-based social protection measures that have been or are going to be

[5] The 2016 value in Taka of the *per capita* US$ 1.90 and US$ 3.20 poverty lines would be BDT 1,944 and BDT 3,171, respectively.

implemented in 2020 based on information on expected coverage, target group, amount, and duration of benefits. Table 5 gives an overview of the four programmes we simulated using our model: the Old Age Allowance (OAA), the Allowances for Widows, Deserted and Destitute Women (WA), the allowances for the Financially Insolvent Disabled (DA), and the PM's cash relief scheme.

Table 5: Social protection measures simulated

Measure	Caseload[f]	Additional caseload	Total annual value (2020 BDT)	Eligibility
OAA (horizontal expansion)	1,602,239 people	500,000 people	6,000	Permanent citizen of one of the 112 poorest Upazilas [a]; must have birth registration/NID number and be of minimum age of 65 for males and 62 for females; annual income cannot be more than BDT 10,000 [b]
WA (horizontal expansion)	468,831 people	350,000 people	6,000	Permanent citizen of one of the 112 poorest Upazilas [a]; must have birth registration/NID number; priority given to the elderly helpless and afflicted widows or women who have been deserted by their husband; annual average income of the candidate must be less than BDT 12,000 [c]
DA (horizontal expansion)	154,134 people	255,000 people	9,000	Permanent citizen of one of the 112 poorest Upazilas [a]; must have registration and identity card from the district social service office according to the 'Protibondhi kollyan ayn, 2001'; annual income below BDT 36,000 [d]
PM's cash relief scheme	N/R	5,000,000 HHs	2,500	Coverage targets by division; made jobless by COVID-19, belonging to 14 categories of informal livelihoods, should not be a recipient of other social protection programmes – although guidelines do not define these and subject to Upazila Nirbahi Officer discretion [e]

Notes: [a] Overall coverage is split across division according to contribution to headcount ratio; [b] Eligible if fulfils age criteria and does not already receive the programme, plus the household-level *per capita* income does not surpass the threshold. [c] Eligible if a widow and does not already receive the programme, plus the household-level *per capita* income does not surpass the threshold. [d] Eligible if has at least one moderate difficulty in any of the dimension of the Washington Group short set of questions and does not already receive the programme, plus the household-level *per capita* income does not surpass the threshold. [e] Coverage is split according to division-level coverage target and the household has one or more daily labourer. [f] Based on self-reporting in 2016/17.

Modelling eligibility for new participants in the programmes is not straightforward in the data due to the nature of the selection processes, which involve some subjective elements, and to there being some uncertainty regarding the exact selection criteria. We based our

assumption on eligibility requirements on the available information on each programme target group and selection modality. Given that the size of the eligible population for each programme is much larger than the expected programme coverage, we randomly allocate benefits across eligible households. The random allocation is repeated 100 times.

At each round of random selection, the amount of the transfer is added to selected beneficiary households' income to generate an expected average impact on income. The expected impact on income is then translated into consumption based on the same assumption used for the overall COVID-19 impact. Finally, revised poverty headcount estimates and statistics on the impoverished population are produced.

2.3 Data sources

Table 6 summarises the key data sources used to parametrise and estimate the microsimulation model. The 2016 HIES provides the household-level data on which the simulation is based. Data on population growth by area of residence are used to update household-level weights to reflect the 2020 situation. All the other data sources are used to define parameters related to the impact of the pandemic on each main economic sector and on inflation.

Table 6: Data sources for the microsimulation

Data	Source	Year
HIES	Bangladesh Bureau of Statistics	2016/17
Urban and rural population data	World Development Indicators (World Bank)	2016–2020
Actual and projected GDP by sector	Bangladesh Bank and World Bank	2016–2020
CPI	Bangladesh Bureau of Statistics	2016–2020
COVID-19 impact survey data	PPCR/BGD survey	2020

3 COVID-19 impact on poverty and consumption

Table 7: Official, baseline, and post-COVID-19 headcount poverty by scenario (% of population)

Scenario	National upper poverty line	Extreme poor (US$ 1.90)	Poor (US$ 3.20)
Official (2016)	24.3	14.5	52.5
Baseline (2020)	18.0	10.1	43.7
Post-COVID-19: Short term	46.4	35.6	69.7
Post-COVID-19: Transition	38.5	28.0	63.0
Post-COVID-19: Recovery	31.2	21.5	56.7

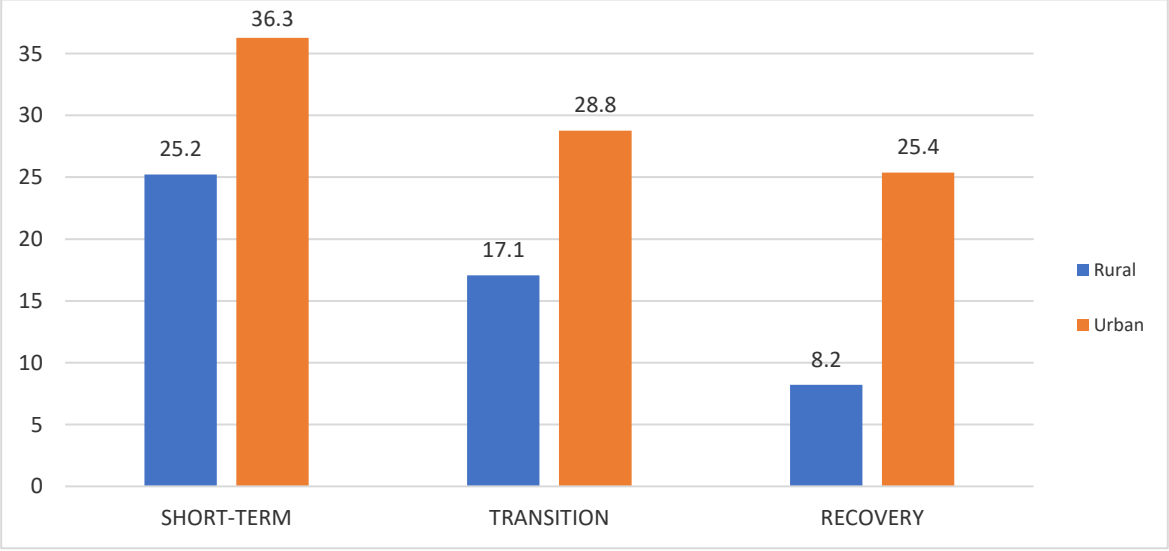
Source: Authors using 2016/17 data.

Table 8: Change in poverty gap with respect to national upper poverty line and Gini Coefficient

Scenario	Poverty gap	Gini
Baseline (2020)	0.035	0.328
Post-COVID-19: Short term	0.169	0.361
Post-COVID-19: Transition	0.135	0.353
Post-COVID-19: Recovery	0.103	0.334

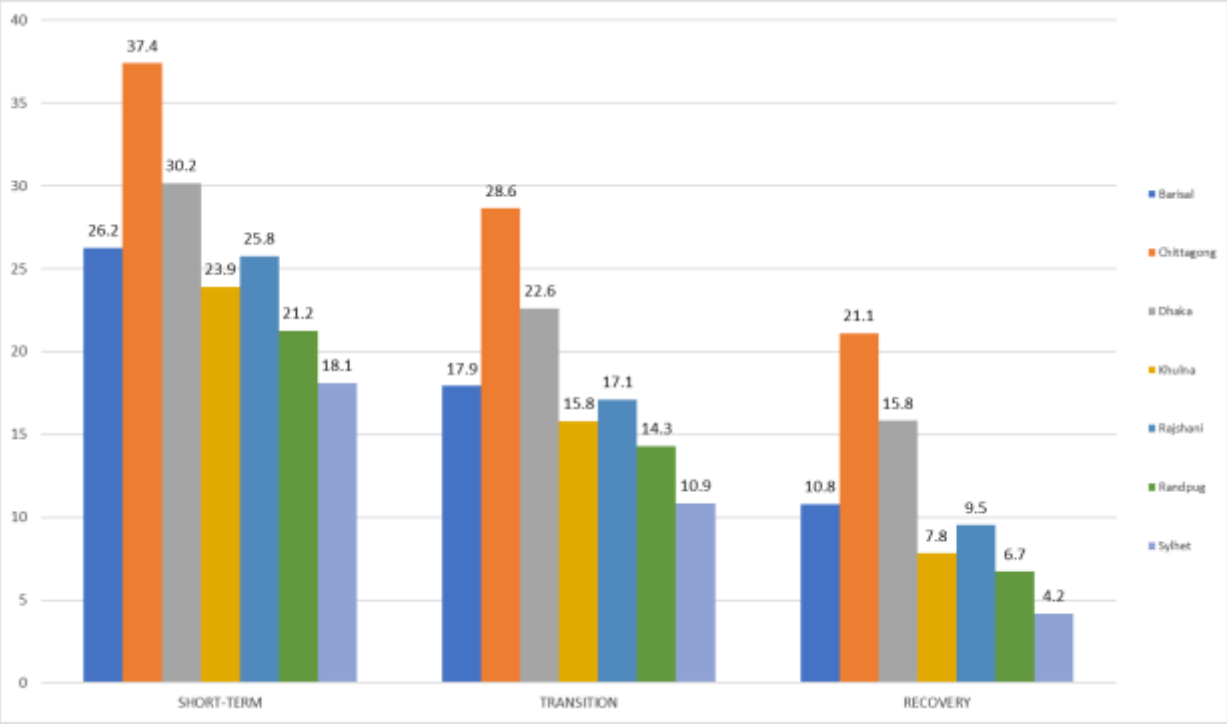
Source: Authors using 2016/17 HIES data.

Figure 2: Percentage point increase in headcount poverty at upper national poverty line, by area of residence, by scenario



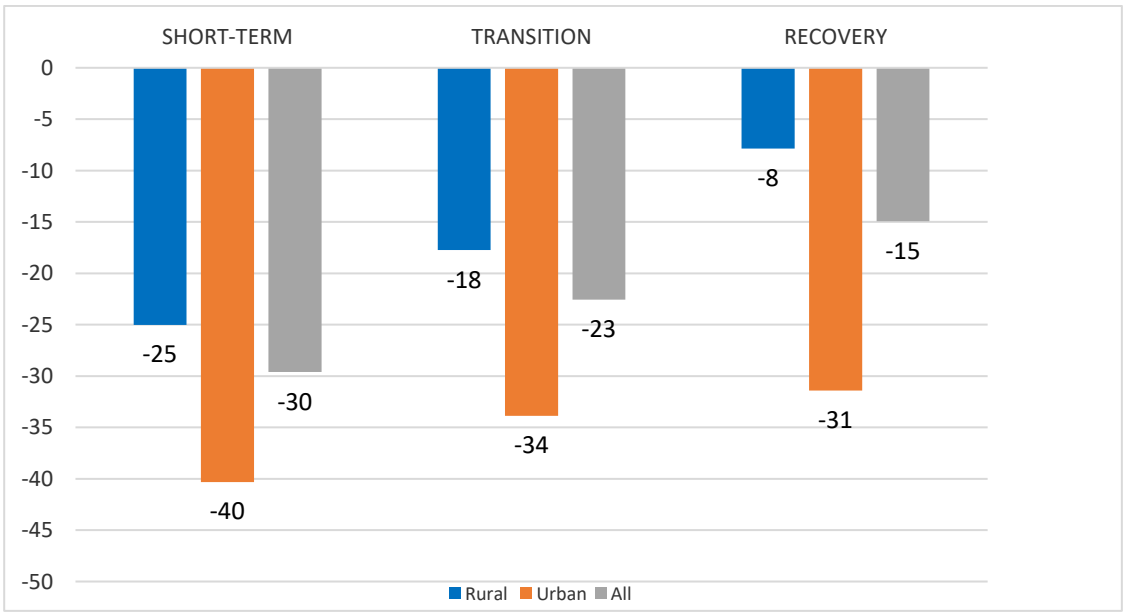
Source: Authors using 2016/17 HIES data.

Figure 3: Percentage point increase in headcount poverty at upper national poverty line, by division



Source: Authors using 2016/17 HIES data.

Figure 4: Average percentage loss of per adult equivalent consumption, by area of residence



Source: Authors using 2016/17 HIES data.

Table 9: Number of newly poor

	Nationally	Rural	Urban
Baseline (2020)	28,921,822	22,900,000	6,021,822
Post-COVID-19: Short term	45,930,432	28,883,414	17,047,020
Post-COVID-19: Transition	33,192,518	19,650,094	13,542,425
Post-COVID-19: Recovery	22,427,162	10,482,433	11,944,729

Source: Authors using 2016/17 HIES data.

Table 10: Characteristics of households that fall into poverty with respect to households already in poverty at baseline

	Baseline poor	Newly poor		
		Short term	Transition	Recovery
Household size	4.5	4.3	4.3	4.4
% with 1+ member with a disability	6.8	4.3	4.3	4.4
% with head aged 65+	10.0	7.9	7.6	7.2
% with female head	11.7	10.3	10.2	9.8
% head is a casual worker	52.1	45.7	47.1	37.6
% head is a formal worker	9.1	19.2	21.7	35.5
% households with business outside agriculture	12.0	17.5	13.4	11.3
% household with business in agriculture	36.8	25.9	24.1	19.4
% head is unemployed	16.5	14.0	13.7	12.9
% head is out of labour force	1.9	0.9	0.9	0.8
% head works in agriculture	36.7	18.6	18.4	13.0
% head works in services	16.3	21.6	23.9	37.7
% head works in industry	8.2	24.8	26.5	22.3
% living in urban areas	20.5	38.4	42.2	54.7

Source: Authors using 2016/17 HIES data.

4 Social protection measures effect

4.1 Coverage

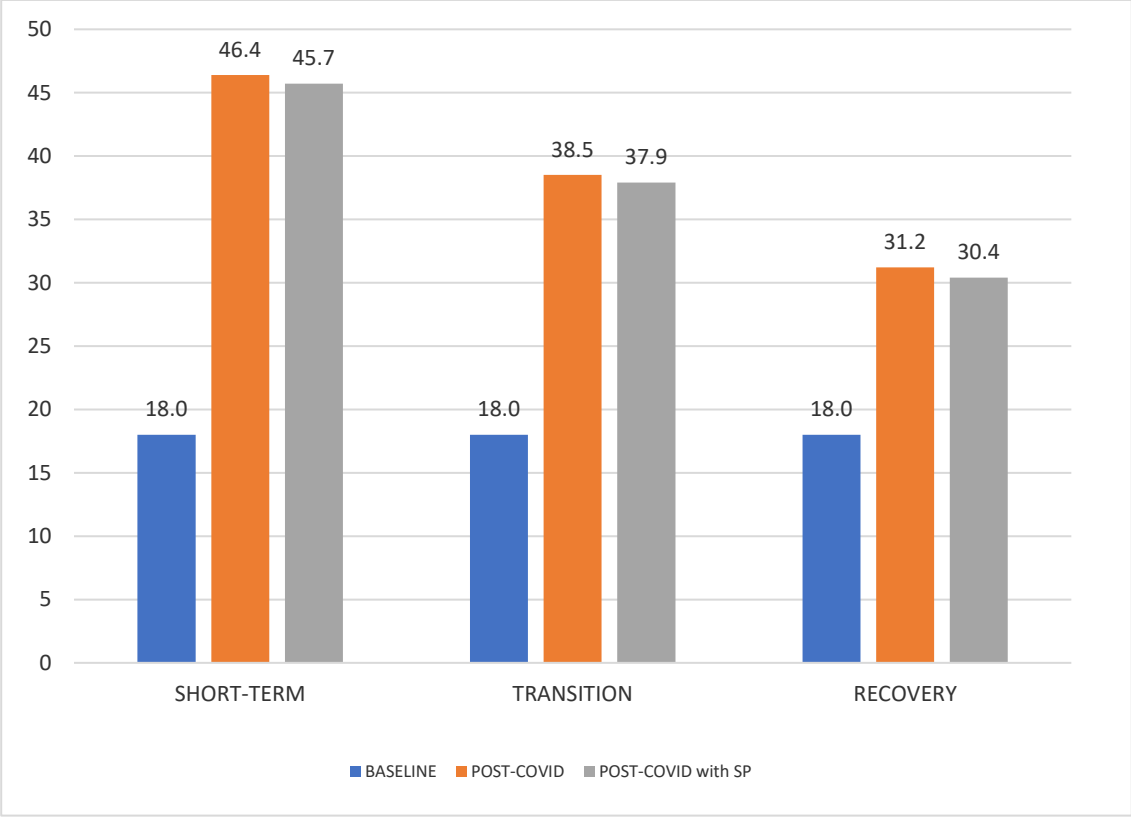
Table 11: Proposed caseload and estimated coverage of eligible population

Programme	Coverage [a]
OAA – horizontal expansion	16.0%
WA – horizontal expansion	17%
DA – horizontal expansion	5%
PM's cash support scheme	35%

Source: Authors using 2016/17 HIES data with population size updated based on population growth. Note: [a] Coverage is computed as caseload over the number of households identified as eligible according to the programme targeting criteria as replicated in the data. The OAA, the WA, and the DA are individual-level programmes; hence, there could be more than one eligible member in a single household. In the data this happens very rarely in 1%, 0.2%, and 2% of eligible households, respectively.

4.2 Poverty impact

Figure 5: Headcount poverty at upper national poverty line (% of population) at baseline and post-COVID-19 (with and without social protection interventions)



Source: Authors using 2016/17 HIES data.

Table 12: Percentage point (PP) decrease in headcount poverty with social protection measures

	National upper poverty line	Extreme poor (US$ 1.90)	Poor (US$ 3.20)
Post-COVID-19: Short term	46.4	35.6	69.7
PP decrease with social protection	-0.7	-0.7	-0.5
Post-COVID-19: Transition	38.5	28.0	63.0
PP decrease with social protection	-0.6	-0.3	-0.5
Post-COVID-19: Recovery	31.2	21.5	56.7
PP decrease with social protection	-0.8	-0.7	-0.8

Source: Authors using 2016/17 HIES data.

4.3 Adequacy

Table 13 compares the annual value of the four social protection interventions we modelled with the upper national poverty line. It shows that none of the programmes that was horizontally expanded covers more than 6% of the *per capita* upper poverty line. When annualised, the value of the PM's cash programme covers only 2% of the upper poverty line on an annual basis.

Table 13: Social protection measures simulated

Measure	Total annual value (BDT)	% of annual national upper poverty line (household level)
OAA	6,000	4%
WA	6,000	4%
DA	9,000	6%
PM's cash support scheme	2,500	2%

Source: Authors using 2016/17 HIES data.

To assess the adequacy of the proposed intervention in the face of the current situation, we looked at the predicted additional needs of households falling into poverty and of those already poor at baseline that fall deeper into poverty. Specifically, we computed the average shortfall from the upper national poverty line for households falling into poverty because of the COVID-19 shock and the additional shortfall from the upper poverty line for households that were already poor at baseline, before the pandemic, but fell deeper into poverty

because of the shock. For example, in the short-term scenario, households that fall into poverty because of the shock need a transfer equal to 32% of the poverty line to go back to being non-poor. On the other hand, households that were already poor at baseline will need a transfer equal to 24% of the poverty line to go back to the level of poverty they had a baseline.

Table 14: Average shortfall from the poverty line for individuals falling into poverty because of COVID-19 and additional shortfall for those falling deeper into poverty

	Newly poor			Baseline poor		
	All	Rural	Urban	All	Rural	Urban
Short term	32%	30%	36%	23%	21%	34%
Transition	33%	32%	34%	18%	16%	28%
Recovery	36%	39%	34%	15%	12%	22%

Source: Authors using 2016/17 HIES data.

Next, we compare the annual monetary value of the average shortfall from the poverty line with the total annual value of each of the emergency transfers proposed. Table 15 looks at the worst impact scenario and shows that the OAA and the WA cover approximately 11% of the amount needed to bring households' consumption to its pre-shock level for households that were not poor at baseline, and 12% for those that were already poor at baseline. The DA programme is more generous and covers respectively 17% and 18% of the amount needed to restore pre-shock consumption levels. The PM's cash support scheme provides only 5%.

Table 15: % of shortfall (additional shortfall) from the upper poverty line for individuals falling into poverty (falling deeper into poverty) because of COVID-19

Measure	% of shortfall covered for newly poor	% of additional shortfall covered for baseline poor
OAA	11%	12%
WA	11%	12%
DA	17%	18%
PM's cash support scheme	5%	5%

Source: Authors using 2016/17 HIES data

5 Conclusions

The lockdown measures introduced by the Government of Bangladesh to contain the pandemic and the repercussions of the global economic slowdown are likely to have a staggering impact on poverty in the country. As our microsimulations show, the post-crisis upper poverty headcount is expected to rise to 32–48% depending on the scenario from the pre-crisis levels of 20.5%. Moreover, the crisis is expected to increase both the poverty gap and the Gini coefficient, resulting in a higher level of inequality. As in other countries, the impact of the crisis is found to be more severe in urban areas where average consumption expenditure is predicted to decrease between 40% and 31% depending on the assumptions vis-à-vis a decline between 25% and 8% in rural areas.

Alongside humanitarian assistance type social safety net programmes, which the country has traditionally deployed to address emergency and food security needs, new programmes were initiated to address the loss of income among specific categories of the population. The PM's cash support, in particular, was designed to mitigate the loss of incomes among day labourers and other informal workers, who are disproportionately women. Alongside this, the government also initiated the expansion of coverage of the OAA, WA, and DA in the 112 poorest Upazilas, recognising the heightened vulnerability of these inherently vulnerable groups.

The simulated impact of the introduction of the PM's cash support and of the expansion of the OAA, WA, and DA is, however, marginal. The programmes combined are able to reduce poverty headcount post-COVID-19 by less than a percentage point. This reflects the longstanding challenges in Bangladesh of meeting the scale of need that far outstrips the available budget, resulting in an unenviable trade-off in terms of coverage, adequacy, and comprehensiveness. As our microsimulations show, none of the programmes that was horizontally expanded covers more than 6% of the *per capita* upper poverty line. In terms of the needs of households falling into poverty or falling deeper into poverty because of the pandemic, none of the programmes analysed provides more than 18% of the amount needed to restore their pre-shock consumption level.

6 Limitations

Our proposed approach is intended to provide a rapid way to assess the impact of current and potential social protection responses to COVID-19 on poverty. There are some key limitations:

- Our model relies heavily on exogenous parameters that provide an indication of the expected short- and longer-term effects of the crisis on the various sectors of the economy. Although informed as much as possible by existing data, the assumptions used in the microsimulation models are inevitably somewhat arbitrary given how much uncertainty exists about how lockdown experiences will ultimately translate into experiences during COVID-19-induced recessions. The predictive power of the model will therefore depend on the goodness and accuracy of these parameters.
- Our model assumes that the coverage of social protection programmes has not changed since 2016/17.
- Our model does not account for substitution effects across goods and for changes in consumption patterns due to the crisis.
- Our model does not capture mobility in the labour market, where workers will switch to more profitable sectors.
- Our model does not account for behavioural effects, in particular those related to the adoption of negative coping strategies that could lead in the medium to long term to a decrease in consumption level and wellbeing.
- Our model does not account for the income and employment loss due to the impact of COVID-19 on individuals' health. Likewise, we do not consider the increased health expenditures incurred by households with one or more member affected by the disease.
- Our model relies on household level income and consumption estimates and it is therefore not suitable to investigate issues of intra-household dynamics. This implies that the results cannot provide answers on the gender-specific impact of the pandemic.

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Annex A Simulation parameters

Table 16: Projected population by area of residence from the year of the survey

	2017	2018	2019[a]	2020[a]	Growth[b]
Urban	57,254,684	59,107,944	60,987,387	61,602,034	1.0759
Rural	102,415,909	102,248,095	102,058,774	103,087,349	1.0066
Total	159,670,593	161,356,039	163,046,161	164,689,383	1.0314

Notes: [a] Overall population size projections based on https://worldpopulationreview.com/countries/bangladesh-population; population projection by area estimated by keeping urban share constant from 2018. [b] Growth of population between 2016 and 2020.

Table 17: Real GDP *per capita* growth by sector

Sector	2016/17–2018/19	2018/19–2019/20 (forecasted pre-COVID-19)
Agriculture	6%	1%
Industry	24%	11%
Mining and quarrying	11%	
Manufacturing	27%	
Electricity, gas, and water supply	17%	
Construction	19%	
Services	11%	4%
Wholesale and retail	14%	
Hotels and restaurants	13%	
Transport storage	12%	
Finance and insurance	13%	
Real estate	8%	
Public administration and defence	13%	
Education	13%	
Health and social work	17%	
Community, social and personal services	5%	

Source: Authors' calculations based on GDP forecast by the World Bank[6] and on official real GDP figures from Bangladesh Bureau of Statistics.

[6] World Bank, 2020. The cursed blessing of public banks, South Asia Economic Focus Spring 2020. IBRD / World Bank

Table 18: Coverage of PM's cash by division

Division	Coverage (N of households)
Dhaka	1,216,000
Mymensingh	267,000
Chattagram	925,000
Rajshahi	584,000
Rangpur	601,000
Khulna	652,000
Barisal	420,000
Sylhet	335,000

Note: Divisions changed since 2016. We included Mymensingh in Dhaka division.

Annex B Additional simulation results

Table 19: Headcount poverty impact of the various impact channels

Scenario	Upper national poverty line	Extreme poor (US$ 1.90)	Poor (US$ 3.20)
Baseline	18.0	10.1	43.7
Short term			
Employment income	38.5	28.2	61.6
Overall income	39.7	29.1	63.4
Inflation	24.7	14.9	52.1
Inflation and employment income	45.1	34.6	68.0
Overall	46.4	35.6	69.7
Transition			
Employment income	30.9	21.9	55.2
Overall income	31.6	22.4	56.3
Inflation	24.7	14.9	52.1
Inflation and employment income	37.7	27.4	61.9
Overall	38.5	28.0	63.0
Recovery			
Employment income	26.7	18.2	51.7
Overall income	26.9	18.3	52.2
Inflation	21.9	12.9	48.9
Inflation and employment income	31.0	21.4	56.2
Overall	31.2	21.5	56.7

Source: Authors using 2016/17 HIES data