ON THE EDGE: VULNERABILITY TO POVERTY IN BANGLADESH

SERIES TALK ON THE FORTHCOMING POVERTY AND EQUITY ASSESSMENT

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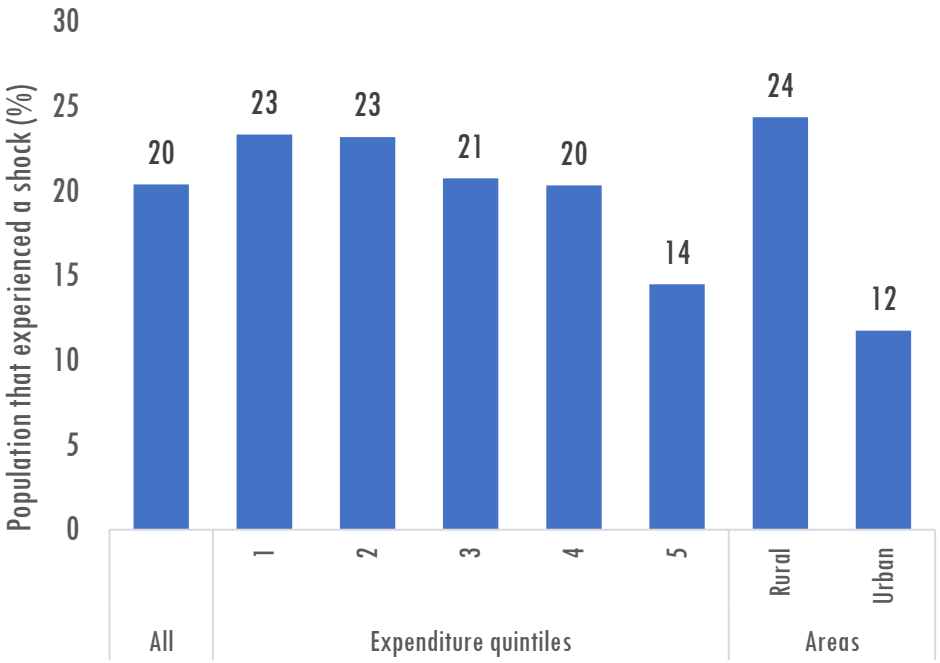
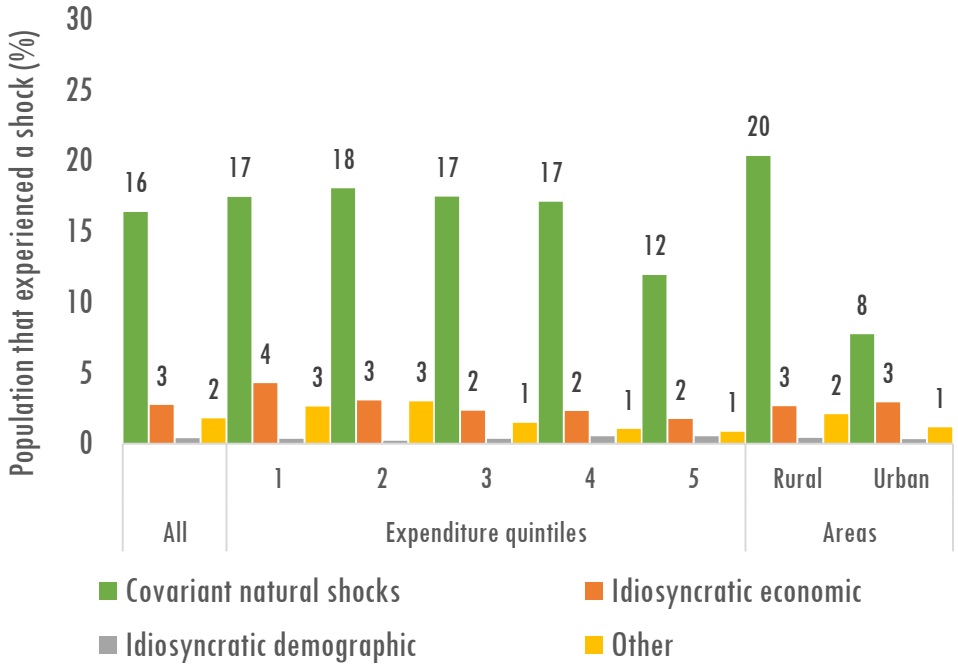
IN 2022, ONE IN FIVE BANGLADESHIS REPORTED BEING AFFECTED BY A NEGATIVE SHOCK

Almost a quarter of Bangladeshis living in rural areas experienced a shock in 2022



Natural shocks are the most prevalent type across quintiles, and rural households bear the brunt of natural disasters



Note: (a) Idiosyncratic Demographic Shocks, such as severe illness or accidents affecting non-income-earning household members; (b) Idiosyncratic Economic Shocks, including income reduction due to factory closures; (c) Covariant Natural Shocks, which encompass natural disasters like flooding, waterlogging, heavy rain, and storms; and (d) other shocks not explicitly categorized.

Source: Own elaboration based on HIES 2022.

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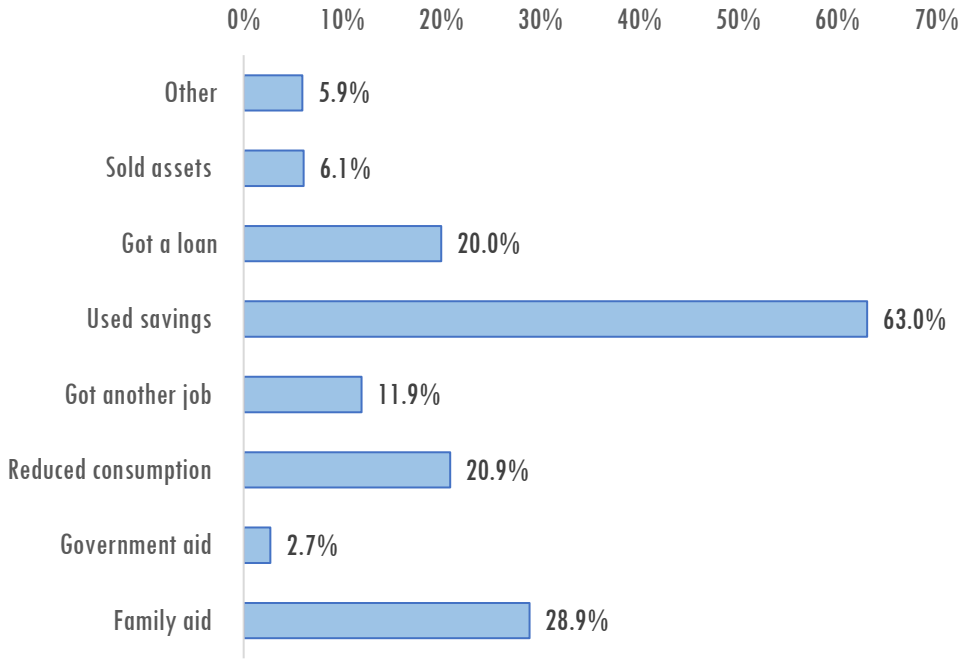
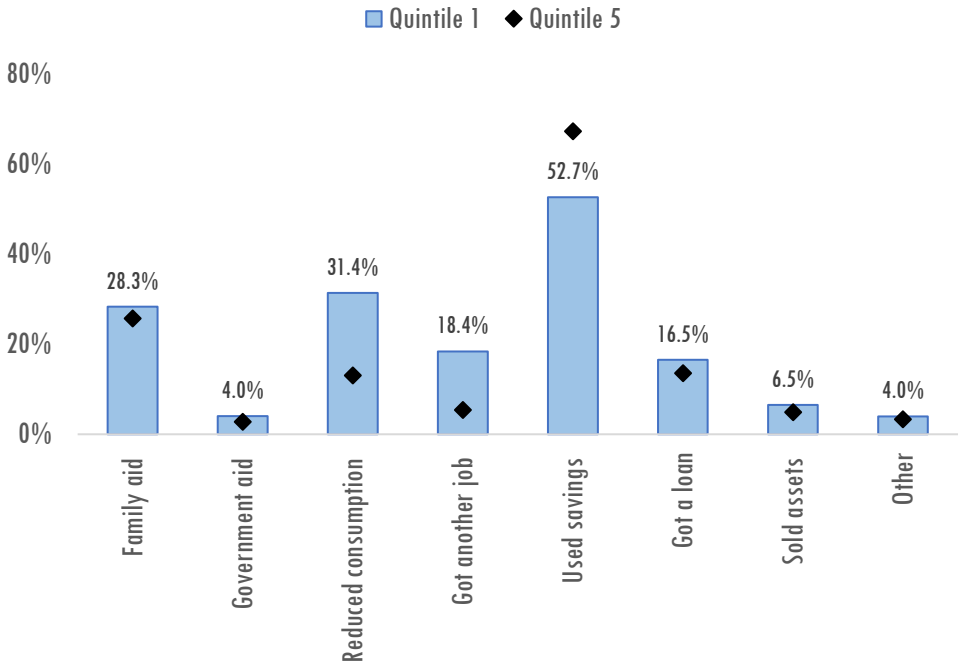
HOUSEHOLDS' RESILIENCE TO NATURAL SHOCKS HINGES ON SOCIOECONOMIC STATUS

Most households deplete their savings to cope with natural shocks, while only a small fraction receive government aid



Poorer households also reduce consumption and seek additional jobs to cope with natural shocks



Source: Own elaboration based on HIES 2022.

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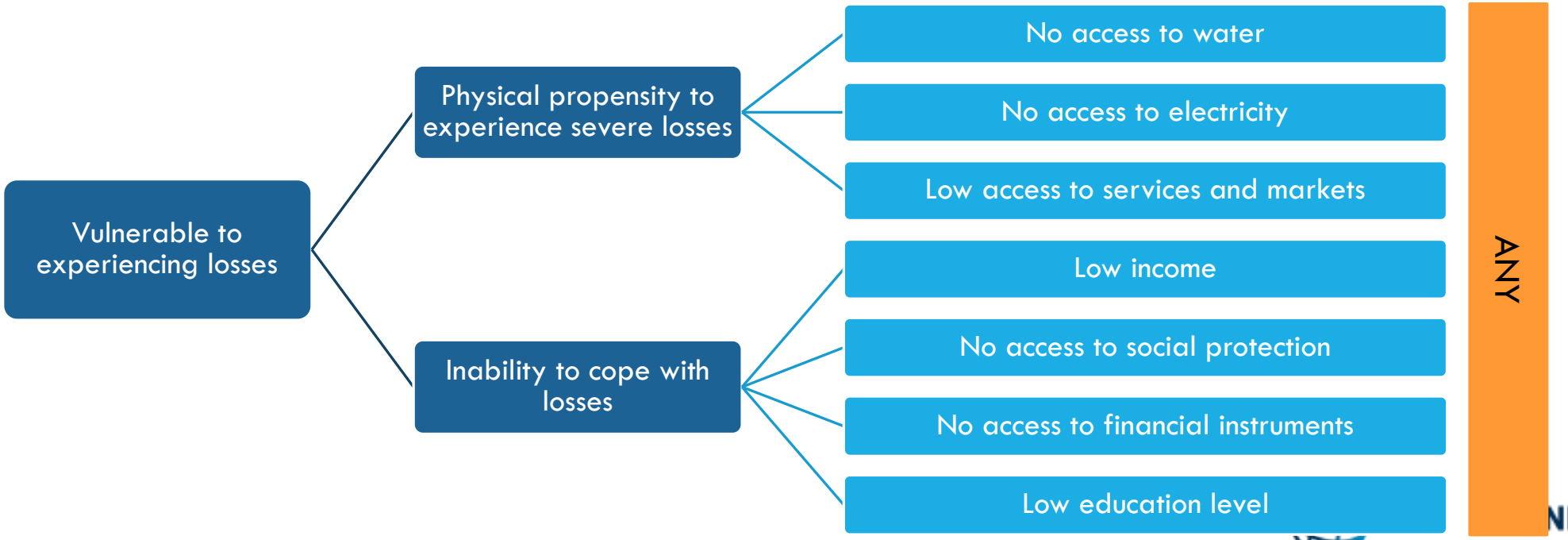
DEFINING VULNERABILITY TO POVERTY

Vulnerability reflects the propensity or predisposition to be adversely affected or unable to cope and adapt

Proxied by 7 indicators:



VULNERABILITY AS A FORWARD-LOOKING PERSPECTIVE ON POVERTY

Vulnerability to poverty is an *unobserved* state linked to two types of situations (Gallardo, 2013):

1. Expected poverty:

V_t

- $E[y_{t+1}] < z$, *with* $E[y_{t+1}] \approx \hat{E}\,[y_t|X_t]$
- $P(y_{t+1} < z) > \delta$, *with* $P(y_{t+1} < z) \approx \hat{P}(y_t < z|X_t)$

2. Downside risk of falling into poverty if $E[y_{t+1}] > z$, but

$E[y_{t+1}] - \gamma r_{t+1} < z$, *with* $E[y_{t+1}] \approx \hat{E}[y_t|X_t]$ *and*

$r_{t+1} = g(Var[y_t|X_t])$

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LIMITATIONS IN TRADITIONAL APPROACHES

- Arbitrariness in traditional threshold-based measures:
  - Welfare (e.g., doubling the poverty line (World Bank, 2019)
  - Risk (e.g., 10% (Lopez-Calva et al., 2014), 29% (Skoufias et al, 2021), or 50% probability of falling into poverty (Gunther & Harttgen, 2009), or the observed poverty rate (Chaudhuri et al., 2002 and Prichett et al., 2000)
- The variability of the error term might not represent the variance of consumption over time (Gunther & Harttgen, 2009)
- Synthetic panels: vulnerability in Colombia (Balcazar et al., 2018), $14/person/day in 2017 PPP (Fernandez et al, 2022))
- These methods assume homogeneity among households within those thresholds.

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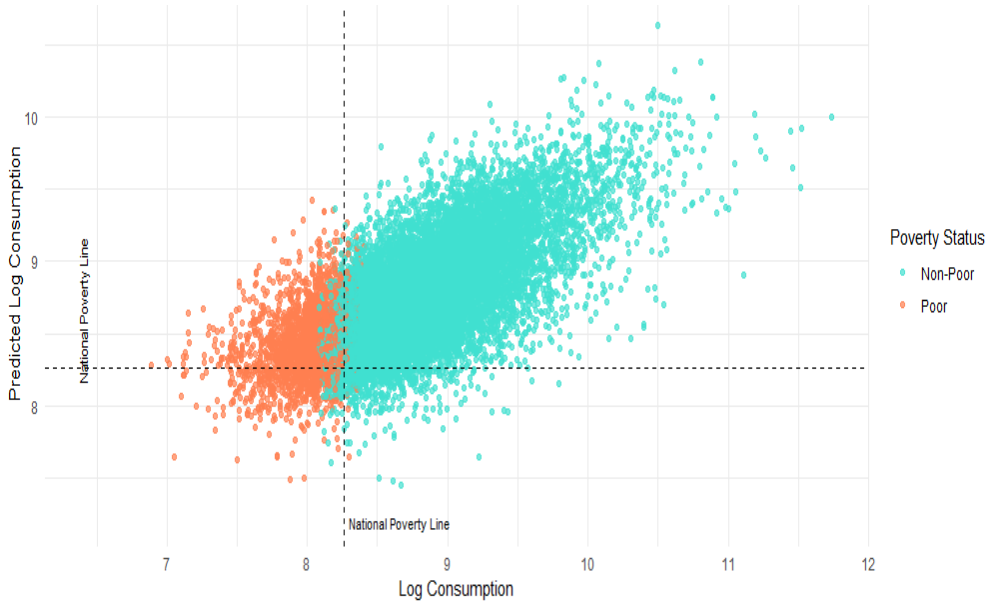
MISCLASSIFICATION OF HOUSEHOLDS

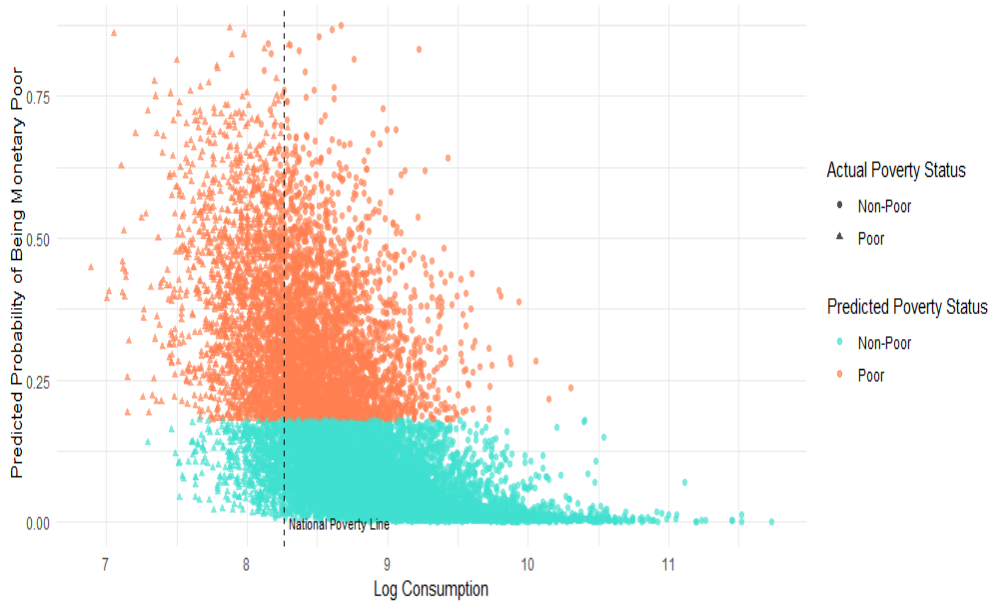
Not all poor households have a predicted consumption below the poverty line, and…



Source: HIES 2022

Note: Predicted log consumption is based on an AIC-stepwise regression model. R2=0.49

… not all poor households are highly likely to be poor



Source: HIES 2022

Note: Predicted log consumption is based on an AIC-stepwise logistic regression model.

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THE PROPOSED APPROACH

I. EXPECTED POVERTY

- Vulnerable: monetary **non-poor** but similar to monetary poor in characteristics related to:
  - Physical propensity to experience severe losses
  - Inability to cope with losses
- Identification strategy
  - A matching approach for each of the previous two dimensions. The process involves:
    1. Estimating propensity scores
    2. Keeping monetary non-poor households in common support of monetary poor
    3. Applying the nearest neighbor matching

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THE PROPOSED APPROACH: EXPECTED POVERTY

1. Estimating Propensity Scores:
   - Logistic regression model:

$$logit(P_i) = log\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \sum_{j \in F_k} \beta_j X_{ji}$$

where F_k set of covariates:

k=1 physical propensity to experience severe losses such as access to electricity, water, sanitation, and dwelling characteristics.

k=2 inability to cope with losses such as human capital, workforce participation, household composition, financial assets, access to credit, and remittances

   - The set of covariates is defined based on an Akaike Information Criterion (AIC)-stepwise variable selection routine and the propensity scores are estimated:

$$\widehat{P_i} = \frac{e^{\beta_0 + \sum_{j \in S} \beta_j X_{ji}}}{1 + e^{\beta_0 + \sum_{j \in S} \beta_j X_{ji}}}$$

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THE PROPOSED APPROACH: EXPECTED POVERTY

2. Keeping monetary non-poor households in common support of monetary poor

   A household i is discarded if $\widehat{P_i} \notin [\max(\hat{P}_{np_{min}}, \hat{P}_{p_{min}}), \min(\hat{P}_{np_{max}}, \hat{P}_{p_{max}})]$, where $\hat{P}_{np_{min}}$ and $\hat{P}_{np_{max}}$ represent the minimum and maximum propensity scores among the non-poor, and $\hat{P}_{p_{min}}$ and $\hat{P}_{p_{max}}$ equivalently among the poor.

3. Applying Nearest Neighbor

   Matched non-poor households i should minimize $|\widehat{P_i} - \widehat{P_p}|$ or being "similar" in propensity score, and identical in terms of division and area.

   Matching with replacement → allows for the inclusion of all non-poor households with similar characteristics to poor households

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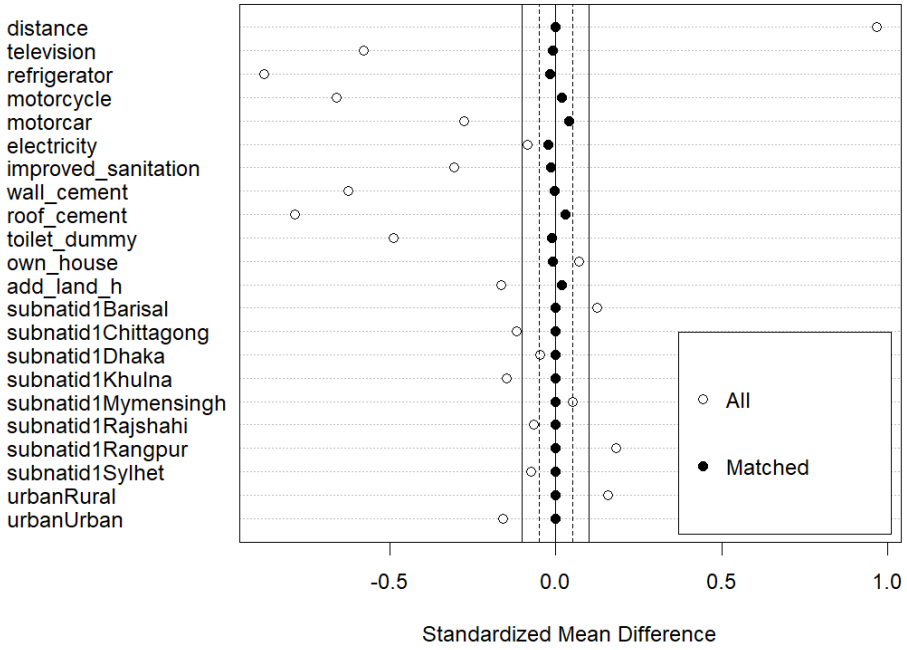
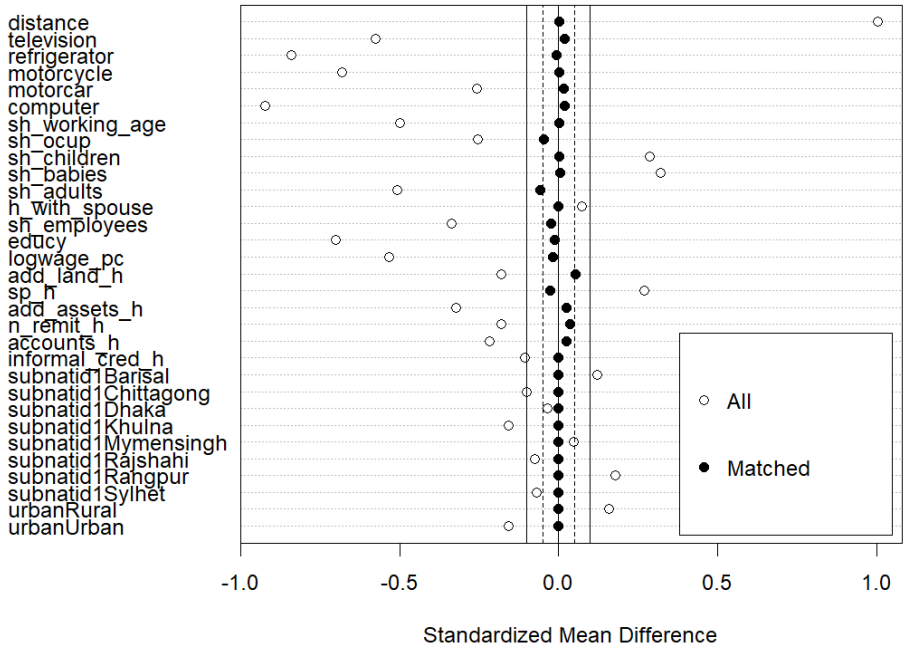
THE PROPOSED APPROACH: EXPECTED POVERTY

Physical propensity to experience severe losses



Inability to cope with losses



Source: World Bank staff elaboration based on HIES 2022

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THE PROPOSED APPROACH: DOWNSIDE RISK

II. DOWNSIDE RISK OF FALLING INTO POVERTY

- Vulnerable: random deviations of well-being outcomes below its expected value
- Estimation strategy
  - Model the whole consumption distribution using a GAMLSS (Hohberg et al., 2018) with a Gamma distribution and checking for robustness with a Lognormal:

$$y_{it} \sim \Gamma(\mu_i, \sigma_i), \forall\ household\ i$$

$$g_\mu(\mu_i) = \beta_{0\mu} + \sum_{j \in F_1 \cup F_2} \beta_{j\mu} X_{ji}$$

$$g_\sigma\left(\frac{\mu_i}{\sigma_i}\right) = \beta_{0\sigma} + \sum_{j \in F_1 \cup F_2} \beta_{j\sigma} X_{ji}$$

With $\beta_{0\mu}$, $\beta_{j\mu}$, $\beta_{0\sigma}$, and $\beta_{j\sigma}$ being estimated via maximum likelihood.

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THE PROPOSED APPROACH: DOWNSIDE RISK

II. DOWNSIDE RISK OF FALLING INTO POVERTY

- Estimation strategy (cont.)
  - Once the model is fitted, the predicted values for each household are used as follows:

$$E[y_{t+1}]_i \approx \hat{E}[y_t|X_t]_i = \hat{\mu}_i$$

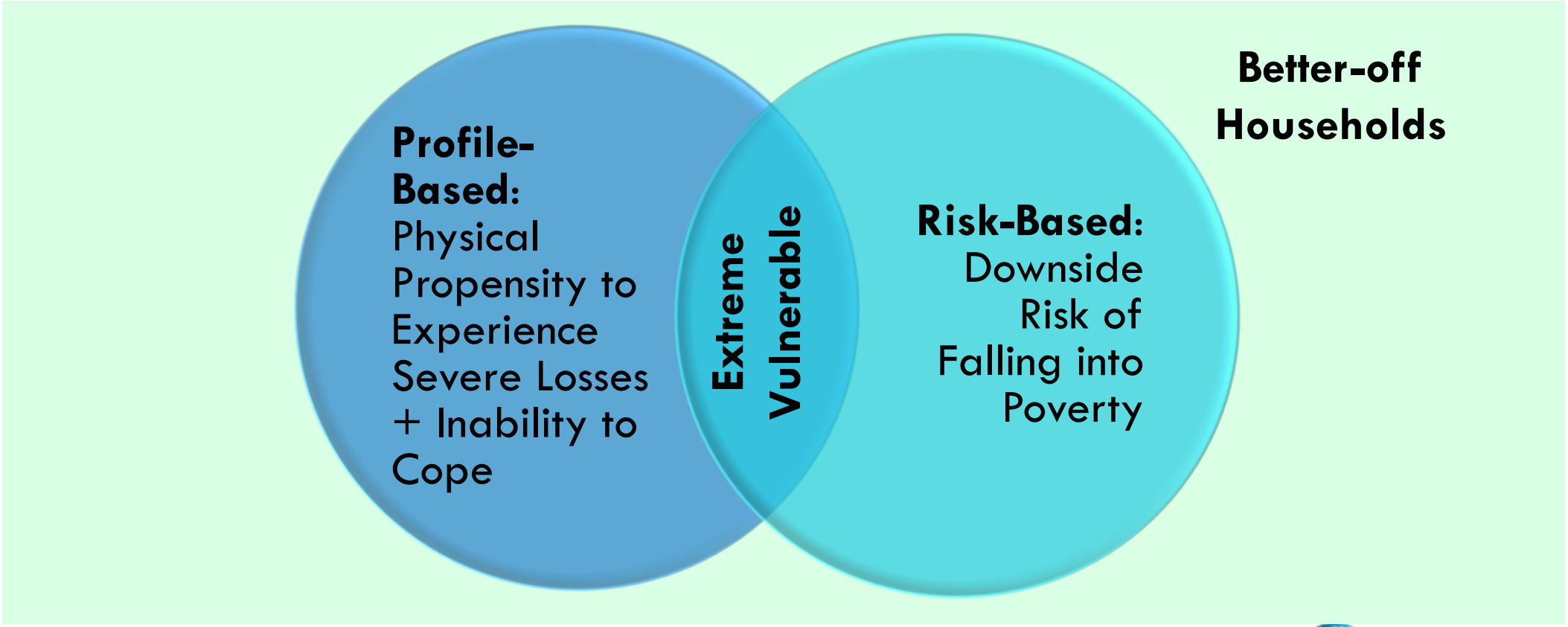
$$r_{t+1_i} \approx \hat{\sigma}_i$$

with a non-monetary poor household i being identified as vulnerable due to a downside risk of falling into poverty if:

$$\hat{\mu}_i - \gamma\hat{\sigma}_i < z,$$

and γ=1 as the mean-risk trade-off coefficient (Gallardo, 2013).

THREE TYPES OF VULNERABLE



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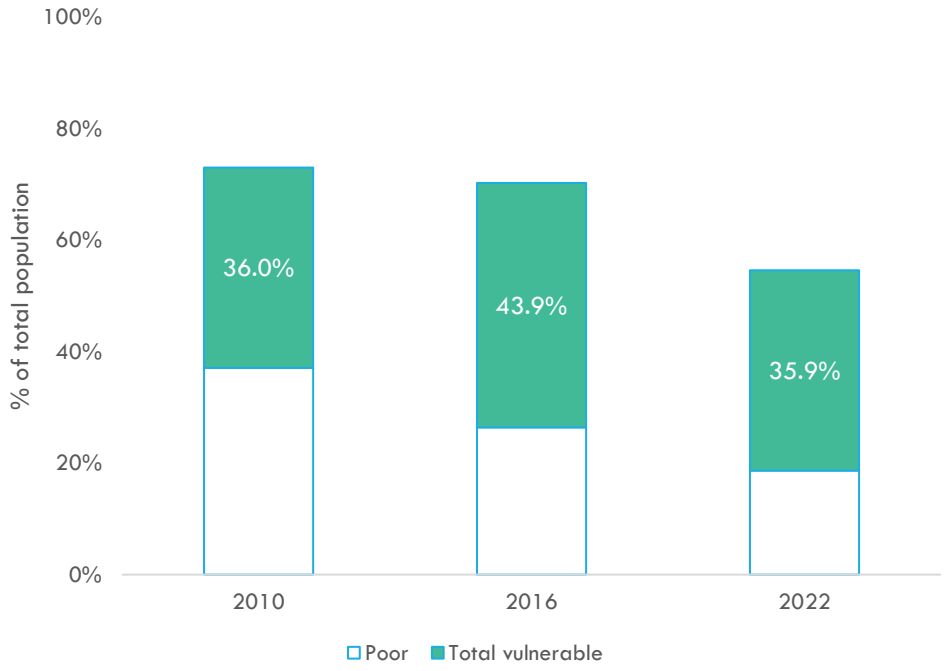
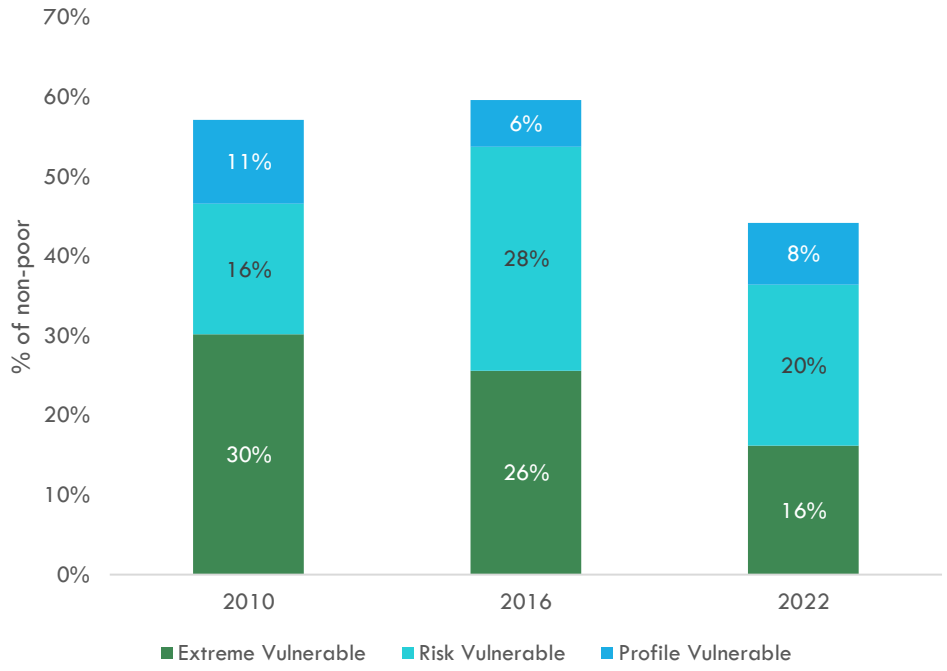
IN 2022, NEARLY HALF OF NON-POOR BANGLADESHIS ARE VULNERABLE TO POVERTY

Poverty reduction was accompanied by a persistent vulnerability to poverty, but…



…enhancements in the profile-based vulnerability shifted the vulnerability composition



Source: World Bank staff elaboration based on HIES 2010, 2016 & 2022

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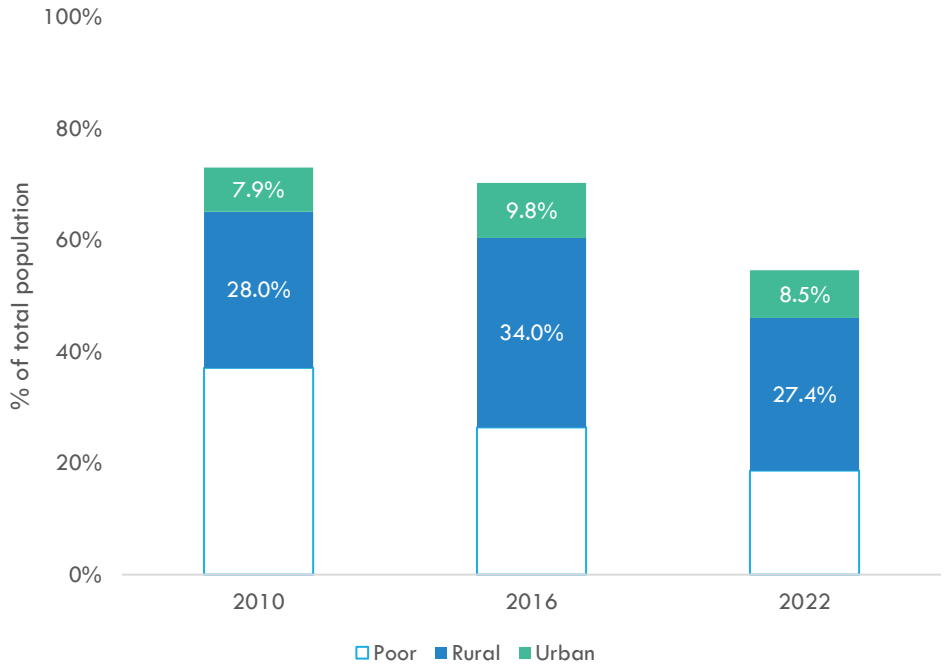
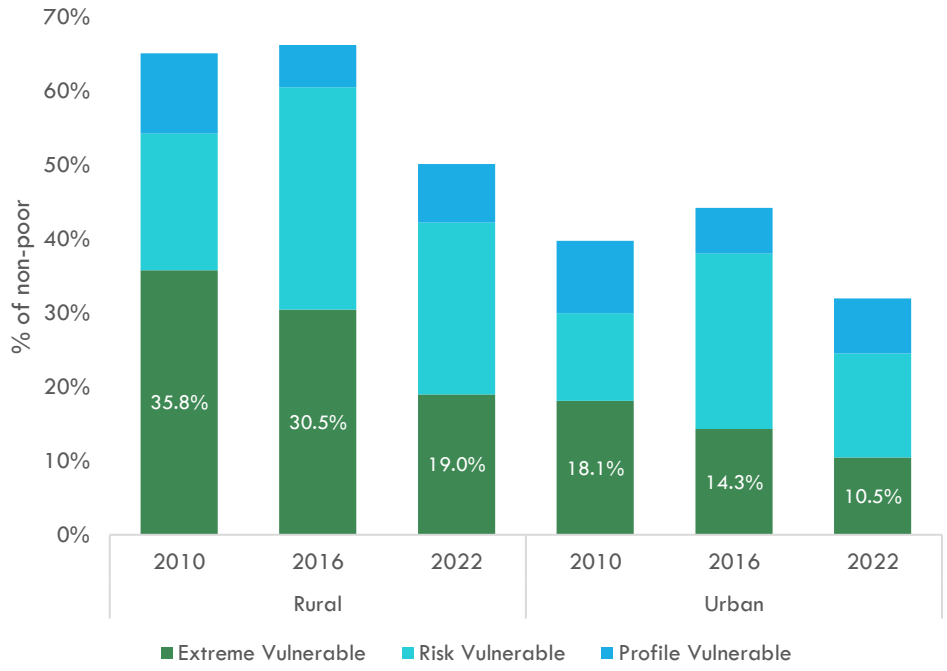
HALF OF NON-POOR BANGLADESHIS IN RURAL AREAS FACE THE RISK OF FALLING INTO POVERTY COMPARED TO ONE IN THREE IN URBAN AREAS

Rural areas improved their vulnerability levels between 2010 and 2022, while urban areas deteriorated.



Extreme vulnerability fell faster in rural areas but remains above urban levels of a decade ago. Still, 4 out of 5 extreme-vulnerable people live in rural areas.



Source: World Bank staff elaboration based on HIES 2010, 2016 & 2022

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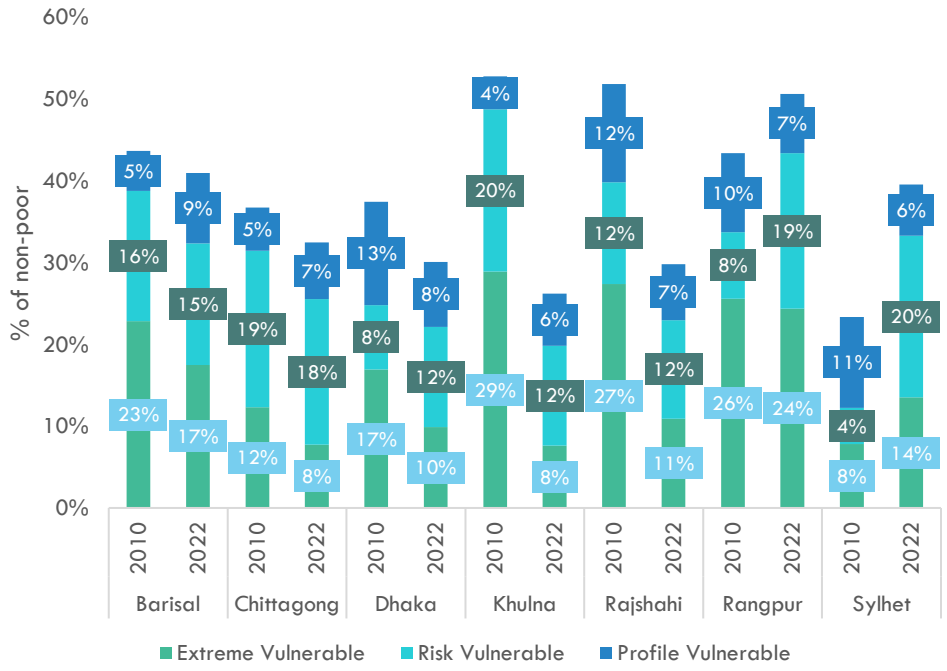
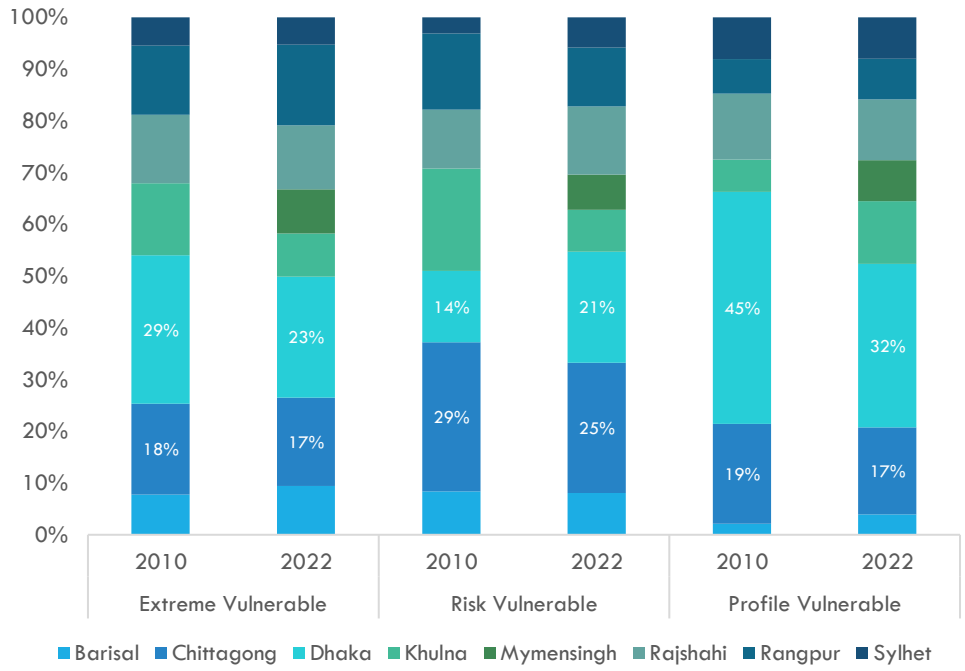
VULNERABILITY DROPPED IN KHULNA AND RAJSHAHI AND ROSE IN RANGPUR AND SYLHET DUE TO HIGHER CONSUMPTION VOLATILITY

The share of extremely vulnerable non-poor populations declined nationwide over the past decade, except in Sylhet.



Dhaka's share of profile-based vulnerability dropped from nearly half in 2010 to one-third in 2022, while risk-based vulnerability rose by 7 p.p. over the decade



Source: World Bank staff elaboration based on HIES 2010, 2016 & 2022

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FINAL REMARKS

- Despite significant progress in poverty reduction, nearly half of non-poor households remain vulnerable to falling back into poverty
- Enhancement in access to basic services contributed the most to vulnerability reduction. Still, about 1 in 5 non-poor households remain at high risk of being poor.
- While overall vulnerability to poverty remained stagnant between 2010 and 2022, urban-rural and division-level results reveal divergent trajectories.
- Despite improvements in reducing the physical propensity to severe losses, the inability to cope and the high volatility of consumption pose major challenges to policymakers
  - Investing in education by improving its quality is fundamental to increasing incomes and preparing for or coping with shocks
  - Enhancing infrastructure increases access to markets and supports risk management and resilience
  - Expanding insurance: increasing financial literacy, access to credit, formal insurance, other financial products (e.g., Mobile money), and safety nets as the last resource for the chronically or extremely poor

THANK YOU