# Poverty

Lecture 3-1
EE461 – 2/2021
Chayanee Chawanote

# Poverty: Outline

- Poverty: conceptual issues
- Poverty measures
- Poverty Trends with COVID-19
- The lives of the poor: characteristics and behaviors
  - Are they rational?
- Poverty and scarcity: a behavioral approach
- Poverty reduction programs
  - Randomized controlled trials (RCTs)
  - Impact evaluations of poverty reduction projects

# Poverty: conceptual issues

- A poverty line: a critical threshold of income, consumption, or access to goods and services below which individuals are declared to be poor.
  - A minimum level of 'acceptable' economic participation in a given society at a given point in time.

## Concerns on poverty measurement:

- Look at actual, observed consumption basket or expenditure (or overall income) falls below the minimum required/threshold.
- Income elasticities may be high, but nutrient elasticities may not be correspondingly high.
- Income represents the capacity to consume, not consumption

# Poverty: conceptual issues

- To assess poverty based on household consumption, it's helpful to think in terms of an expenditure function showing the minimum expense required to meet a given level of utility u. Let $y_i$ be the consumption measure for household i, then an expenditure measure of welfare denoted by

  $y_i = p*q = e(p, x, u)$

  p – a vector of prices of goods and services

  q – a vector of quantities of goods and services consumed

  e(.) – an expenditure function

  x – a vector of household characteristics

>> Given the prices p that it faces, and its demographic characteristics (x), $y_i$ measures the spending that is needed to reach utility level u.

# Concerns on poverty measurement

- Income or consumption?
  - Mostly, rich countries use income while poor countries use expenditure. Why? (Rich: wages & salaries, Poor: self-employment)

**Income ("potential")**

**Pro:**
- Easy to measure, given the limited number of sources of income.
- Measures degree of household "command" over resources (which they could use if they so wish).
- Costs only a fifth as much to collect as expenditure data, so sample can be larger.

**Con:**
- Likely to be underreported.
- May be affected by short-term fluctuations (for example, the seasonal pattern of agriculture).
- Some parts of income are hard to observe (for example, informal sector income, home agricultural production, self-employment income).
- Link between income and welfare is not always clear.
- Reporting period might not capture the "average" income of the household.

**Consumption ("achievement")**

**Pro:**
- Shows current actual material standard of living.
- Smoothes out irregularities, and so reflects long-term average well-being.
- Less understated than income, because expenditure is easier to recall.

**Con:**
- Households may not be able to smooth consumption (for example, via borrowing, social networks).
- Consumption choices made by households may be misleading (for example, if a rich household chooses to live simply, that does not mean it is poor).
- Some expenses are not incurred regularly, so data may be noisy.
- Difficult to measure some components of consumption, including durable goods.

*Source:* Adapted from Albert (2004).

# Concerns on poverty measurement

- **Other measures of household welfare:**
  - Calories consumed per person per day
  - Food consumption as a fraction of total expenditure
  - Outcomes of malnutrition: underweight, stunting, wasting

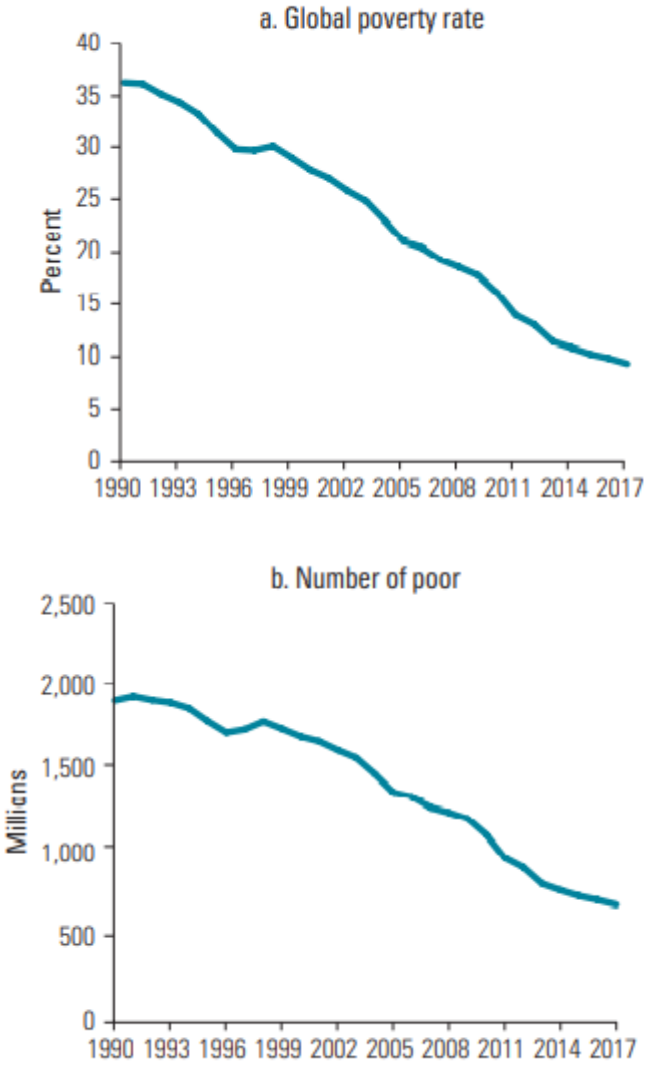
- **Households or individuals?**
  - Often income and consumption data are available at household-level
  - Individuals: just do average?, or need adult equivalence scales to convert children's consumption as a fraction of a representative adult
    - OECD scale for adult equivalent (AE): AE = 1 + 0.7($N_{adults}$ – 1) + 0.5$N_{children}$
    - Other scale: $AE = (N_{adults} + \alpha N_{children})^{\theta}$, $\alpha$ – cost of a child relative to an adult, $\theta \leq 1$ captures the effects of economies of scale
  - What's about allocation of expenditures within the household? >> intra-household allocation

# Concerns on poverty measurement

- Absolute or relative?
  - Absolute: independent of the contours of the society under consideration
  - Relative: evaluate relative to the prevailing socioeconomic standards
  - Poverty lines should share some common components, but vary from country to country

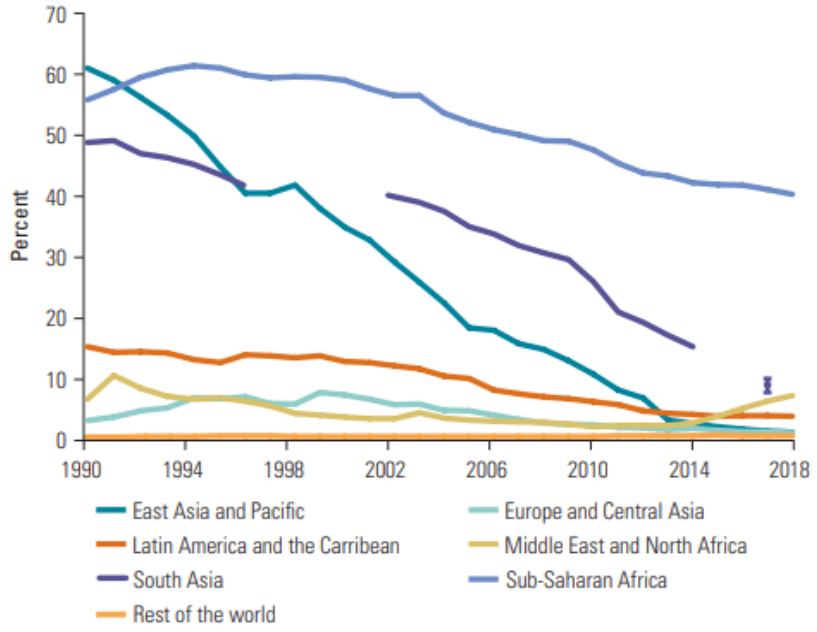
- Temporary or chronic?
  - People in a state of poverty often experience significant fluctuations in their income and consumption.
  - 'Temporary poverty' occurs when people temporarily enter a poverty state because of bad economic shocks.
  - 'Chronic poverty' is when they constantly stay in a poverty state for a long time.
  - Policies to deal with problems are also different.

**FIGURE 0.1 Global Poverty Rate and Number of Poor at the US$1.90-a-Day Poverty Line, 1990–2017**




*Source:* PovcalNet (online analysis tool), World Bank, Washington, DC, http://iresearch.worldbank.org/PovcalNet/.
*Note:* The global coverage rule is applied (see annex 1A in chapter 1 in this report).

**FIGURE 0.2 Trends in Poverty Rates at the US$1.90-a-Day Poverty Line, by Region, 1990–2018**




*Source:* PovcalNet (online analysis tool), World Bank, Washington, DC, http://iresearch.worldbank.org/PovcalNet/.
*Note:* Lined-up poverty estimates for South Asia are not reported for 1997–2001 and after 2014 because of a lack of population coverage (see box 1.2 on India and annex 1A in chapter 1 of this report). For South Asia in 2017, a range [7.7; 10.0] is reported, as described in box 1.2 in chapter 1 of this report.

- Higher absolute poverty lines: US$3.20 and US$5.50 per person per day

# Concerns on poverty measurement

- Why a poverty line, anyway?
  - keep in mind: poverty is not a ‘zero-one’ concept (poor vs. non-poor)

- http://www.worldbank.org/en/news/video/2018/10/17/new-ways-of-looking-at-poverty

- https://www.worldbank.org/en/topic/measuringpoverty
  - PovCalNet: http://iresearch.worldbank.org/PovcalNet/home.aspx
  - Poverty & Equity Data Portal: http://povertydata.worldbank.org/poverty/home/

- https://www.worldbank.org/en/publication/poverty-and-shared-prosperity

# Poverty measures

- Poverty line, general definition: an expenditure threshold that is regarded as minimally necessary for 'adequate' participation in economic life. People below this threshold will be said to be poor.

  y – income/expenditure
  subscripts i, j – individuals
  p – poverty line
  m – mean income of the economy
  N – total population

- '**relative incidence**': compared to the total population of the country or region under consideration

# Poverty measures

- Head-count ratio
  - Head-count (HC):

    q = total number of individuals $i$ such that $y_i < p$
  - Head-count ratio (HCR):

    HCR = q/N
  - Measure incidence of poverty
  - Comments: fail to capture the extent to which individual income falls below the poverty line, lead to biased policy decisions toward individuals who are very close to the poverty line
  - Ignore 'relative deprivation' among the poor (inequality among the poor)

# Poverty measures

- **Poverty gap ratio (PGR):**

$$PGR = [\Sigma_{yi < p}(p - y_i)]/Nm$$

  - The ratio of the average of income needed to get all poor people to the poverty line, divided by the mean income of the society
  - a measure of resources required to eradicate the poverty
  - What if an economy is highly unequal but overall wealthy with a large number of poor people?

- **Income gap ratio (IGR):**

$$IGR = [\Sigma_{yi < p}(p - y_i)]/p\text{HC}$$

  - Total shortfall of the poor from the poverty line, but also divide the shortfall by the total income required to bring all the poor people to the poverty line
  - Measures it relative to the total income needed to make that poverty go away
  - Capture the acuteness of poverty

- PGR & IGR capture ‘depth’ or ‘per capita intensity’ of poverty

# Poverty measures

- **FGT(α)**: Forster-Greer-Thorbecke

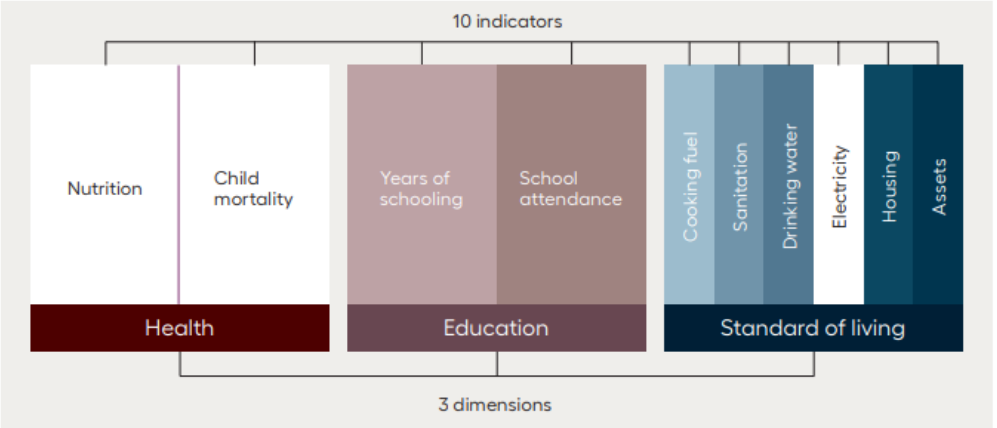
$$FGT^{\alpha} = \frac{1}{Np^{\alpha}} \sum_{i=1}^{q} (p - y_i)^{\alpha}$$

  - Headcount (α=0): $\text{HCR} = \frac{q}{N}$
  - Poverty Gap (α=1): $PGR = \frac{1}{Np} \sum_{i=1}^{q} (p - y_i) = \frac{q}{N} \frac{(p - \bar{y}_{poor})}{p}$
  - Poverty Severity (α=2): $PS = \frac{1}{Np^2} \sum_{i=1}^{q} (p - y_i)^2$

# Other poverty measures

- Sen Index
- Sen-Shorrocks-Thon Index
- Watts Index

- Multidimensional Poverty Index (MPI)
  - It complements traditional income-based poverty measures by capturing the severe deprivations that each person faces at the same time with respect to education, health and living standards.
  - The MPI is calculated by multiplying the incidence of poverty (Headcount ratio) by the average intensity across the poor (A).



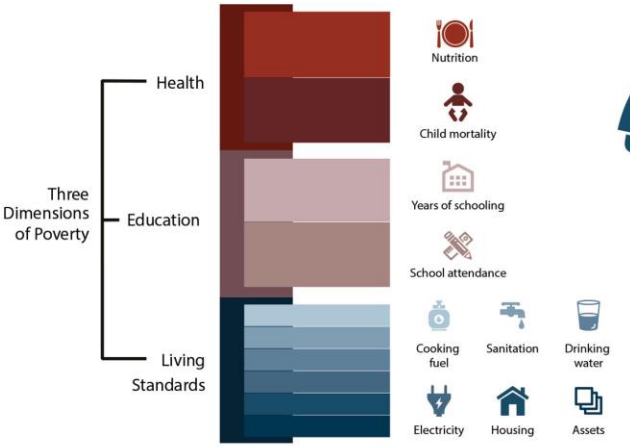

https://ophi.org.uk/global-mpi-2021/

| Dimensions of poverty | MPI indicator | SDG Area | Deprived if… | Weight |
|---|---|---|---|---|
| Health | Nutrition | SDG 2 | Any person under 70 years of age, for whom there is nutritional information, is malnourished. [1] | 1/6 |
| | Child Mortality | SDG 3 | A child under 18 years of age has died in the family in the five-year period preceding the survey.[2] | 1/6 |
| Education | Years of schooling | SDG 4 | No household member aged 10 years or older has completed six years of schooling. | 1/6 |
| | School Attendance | SDG 4 | Any school-aged child is not attending school up to the age at which he/she would complete class 8.[3] | 1/6 |
| Living Standard | Cooking Fuel | SDG 7 | A household cooks with dung, agricultural crop, shrubs, wood, charcoal or coal. | 1/18 |
| | Sanitation | SDG 11 | The household's sanitation facility is not improved (according to SDG guidelines) or it is improved but shared with other households.[4] | 1/18 |
| | Drinking Water | SDG 6 | The household does not have access to improved drinking water (according to SDG guidelines) or safe drinking water is at least a 30-minute walk from home (as a roundtrip).[5] | 1/18 |
| | Electricity | SDG 7 | The household has no electricity. [6] | 1/18 |
| | Housing | SDG 11 | The household has inadequate housing: the floor is made of natural materials or the roof or walls are made of rudimentary materials. [7] | 1/18 |
| | Assets | SDG 1 | The household does not own more than one of these assets: radio, TV, telephone, computer, animal cart, bicycle, motorbike, or refrigerator, and does not own a car or truck. | 1/18 |

https://ophi.org.uk/multidimensional-poverty-index/databank/

# 2018 Global Multidimensional Poverty Index (MPI)

The global MPI directly measures the deprivations people face at the same time in different aspects of their lives. The MPI has three dimensions and ten indicators.




A person is MPI poor if he or she is deprived in **1/3** or more of these weighted indicators, where health and education indicators are weighted at **1/6** and living standards indicators at **1/18.**

## The 2018 global MPI estimations show:

Today, there are **1.3 billion** MPI poor people.

**83%** of the MPI poor live in Sub-Saharan Africa and South Asia.

Half of MPI poor people are children.

**90%** of all children are MPI poor in South Sudan and Niger.

**35** countries at least half of all children are MPI poor.

### Where Do 1.3 billion MPI Poor People Live?


Two-thirds of all multidimensionally poor people live in middle-income countries.

**46%** of those who are multidimensionally poor live in severe poverty, meaning they are deprived in at least half of the weighted indicators in health, education and living standards.

### Countries with the largest number of people living in multidimensional poverty

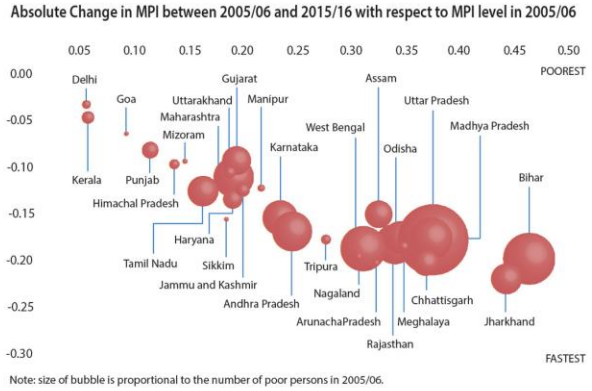

*Preliminary estimates, does not include data for Brazil.

### India: A super trend but more work needs to be done

**271** million people **MOVED OUT OF POVERTY IN TEN YEARS.**

It has cut its poverty rate from 55 percent to 28 percent, and the poorest states reduced poverty the fastest.

Yet India still has the largest number of people living in poverty in the world: 364 million

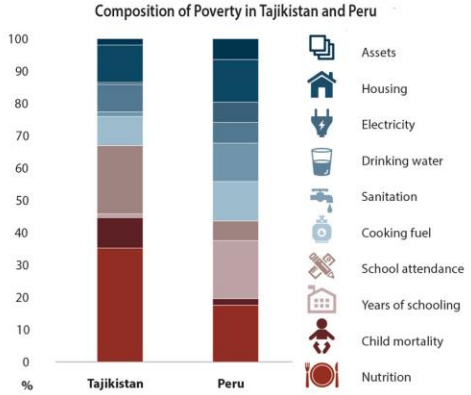



Note: size of bubble is proportional to the number of poor persons in 2005/06.

### How are people poor? MPI can be broken down by indicator to show what deprivations create poverty in a country

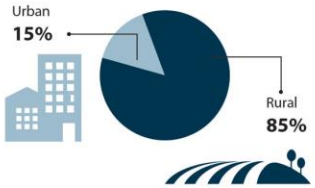
How people are MPI poor varies a lot among countries – necessitating very different policy responses.

For example, Tajikistan and Peru have similar MPI levels, but they differ markedly in the composition of their poverty. In Peru years of schooling contributes 18 percent of the MPI while in Tajikistan it is only 1 percent.

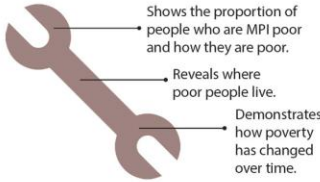



### Multidimensional poverty is more intense in rural areas

Globally, there are 1.1 billion people living in multidimensional poverty in rural areas and 200 million people living in multidimensional poverty in urban areas.




### The global MPI is an important tool to measure and tackle poverty, because it:




The global MPI helps to end poverty in all its forms and dimensions.

#MultidimensionalPovertyIndex #MPI4SDGs

For more information please visit ophi.org.uk

https://ophi.org.uk/infographics/

## BOX 1.1 Different Measures for Understanding Poverty

This box provides a brief overview of the additional poverty measures that were explained in depth in the previous edition of this report (World Bank 2018). Two of the measures were introduced at the recommendation of the Atkinson Commission on Global Poverty (World Bank 2017a).

### Higher absolute poverty lines: US$3.20 and US$5.50 per person per day

The international poverty line (IPL) was constructed using the national poverty lines for some of the poorest economies in the world (Ferreira et al. 2016; Ravallion, Chen, and Sangraula 2009). When it was set up, 60 percent of the global population lived in low-income countries, making the IPL a meaningful measure for a large share of the world's population (World Bank 2018). As of 2017, only about 9 percent of the world's population lived in low-income countries, while 41 percent of people lived in lower-middle-income countries (LMICs) and 35 percent in upper-middle-income countries (UMICs). Based on this shift in the global distribution of income, the World Bank introduced two additional poverty lines to reflect poverty lines typically found in LMICs (US$3.20 a day) and UMICs (US$5.50 a day) (World Bank 2018). These additional poverty lines represent the median value of national poverty lines in LMICs and UMICs as of 2011 (Jolliffe and Prydz 2016). Similar to the IPL, these higher poverty lines remain fixed over time and across countries.

### Societal poverty

Following the recommendations of the Atkinson Commission on Global Poverty (World Bank 2017a), the World Bank introduced the societal poverty measure, which is also a way to measure poverty as countries grow. Unlike the US$3.20-a-day and US$5.50-a-day poverty lines, which remain fixed over time, the societal poverty line (SPL) varies across countries and within countries over time. Formally, it is defined as $SPL = \max(\text{US\$1.90}, \text{US\$1.00} + 0.5 \times \text{median})$, where median is the daily median level of income or consumption per capita in the household survey. The SPL combines elements of absolute poverty with elements of relative poverty.[a] It incorporates a floor at the IPL to emphasize that the focus of the World Bank remains on extreme poverty and that the value of the SPL will never be lower than the IPL.[b] At the same time, the SPL rises with higher levels of the median (above the floor set at the IPL); that is, it is relative to median consumption across countries (Jolliffe and Prydz 2017) to capture the increasing basic needs that a person faces to conduct a dignified life as a country becomes richer. Although the SPL varies across countries and within countries over time, it still allows for meaningful global comparisons because it is defined the same way for all countries.

### Multidimensional poverty measure

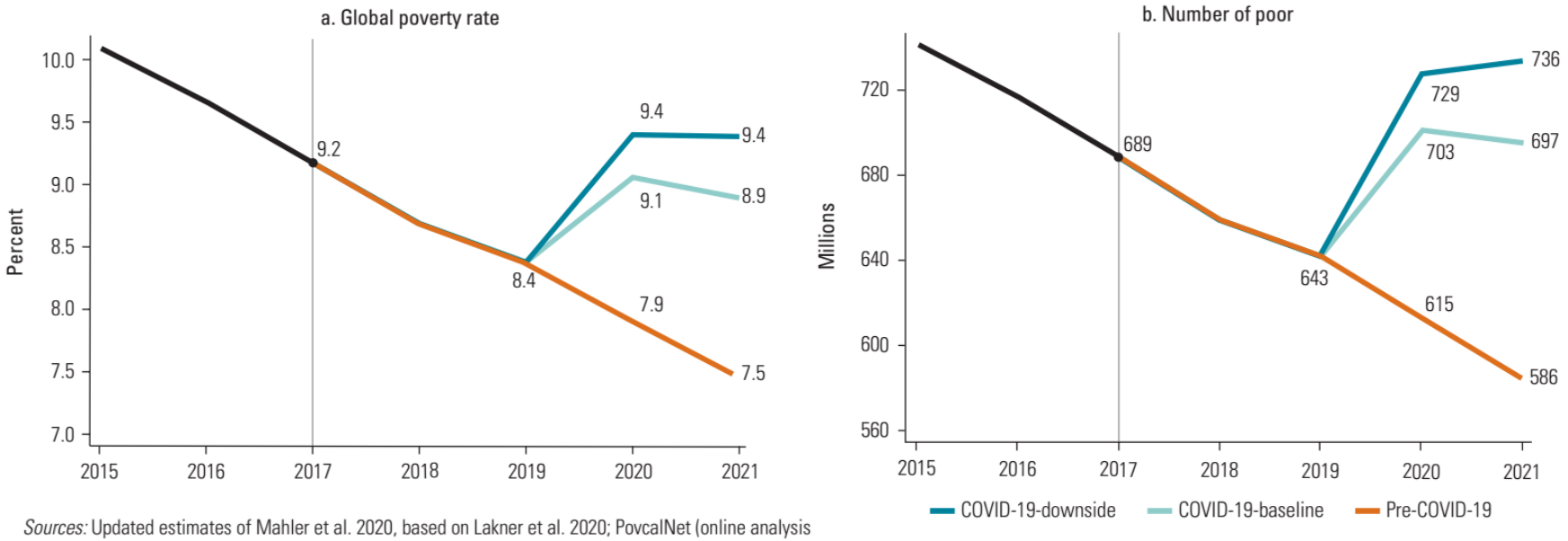
Also in response to the Atkinson Commission on Global Poverty (World Bank 2017a), the World Bank developed a multidimensional poverty measure (MPM) in 2018 (World Bank 2018). Six indicators (consumption or income, educational attainment, educational enrollment, drinking water, sanitation, and electricity) are selected and mapped into three dimensions of well-being (monetary standard of living, education, and basic infrastructure services) to construct the MPM. Annex 1D, table 1D.1, provides an overview of the dimensions that are included and their weight in the index, and it explains how the estimation of the index has been updated. See chapter 4 in the previous edition of this report (World Bank 2018) for a review of the relevant literature, data, and methodology for calculating the World Bank's MPM.

a. Measures of absolute poverty are based on a parameter that remains fixed over time, for example, the IPL and the US$3.20 and the US$5.50 poverty lines, and they help track poverty changes over time by keeping the benchmark fixed. Conversely, relative poverty measures change depending on the income level in a country, that is, they are relative to a measure of welfare that reflects changes in living conditions and are useful for tracking how the definition of poverty evolves as countries get richer. Useful references for understanding this difference include Atkinson and Bourguignon (2001); Foster (1998); Jolliffe and Prydz (2017); Ravallion and Chen (2011, 2019); World Bank (2017a).

b. The SPL is estimated as follows: First, the median level of daily per capita consumption (or income) for each national distribution is extracted from PovcalNet (PovcalNet [online analysis tool], World Bank, Washington, DC, http://iresearch.worldbank.org/PovcalNet/). Then each country-year observation is assigned a value of the SPL according to the equation given in the text. If this value exceeds US$1.90, the SPL is passed to PovcalNet to estimate the poverty rate associated with this line. The regional and global values represent population-weighted averages and use the same methodology applied to the IPL aggregate values (see annex 1A). For additional details on how the SPL is defined and how it compares with other measures of relative poverty, see Jolliffe and Prydz (2016, 2017) and chapter 3 in World Bank (2018). Additional seminal work in this field can be found in Atkinson and Bourguignon (2001) and Ravallion and Chen (2011, 2013, 2019).

# Poverty trends with COVID-19

**FIGURE 1.4 Nowcasts of the Global Poverty Rate and Number of Poor at the US$1.90-a-Day Poverty Line, 2015–21**



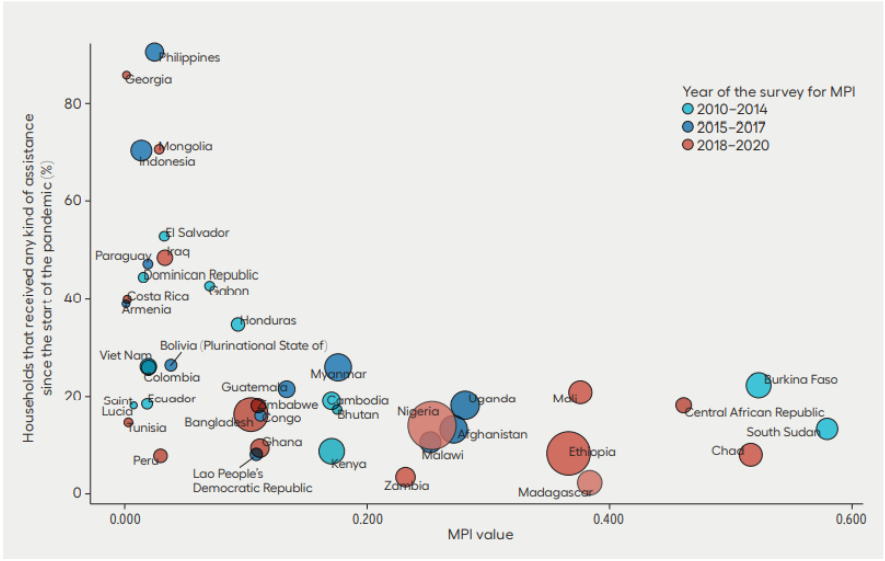

*Sources:* Updated estimates of Mahler et al. 2020, based on Lakner et al. 2020; PovcalNet (online analysis tool), World Bank, Washington, DC, http://iresearch.worldbank.org/PovcalNet/; World Bank 2020a, 2020b.
*Note:* Three growth scenarios are considered: First, pre-COVID-19 uses the January 2020 *Global Economic Prospects* (GEP) growth forecasts for 2020 and 2021, predating the COVID-19 crisis, and the June 2020 forecasts for 2019. Second and third, COVID-19-downside and COVID-19-baseline use the June 2020 GEP growth forecasts projecting a contraction in global growth in 2020 of 8 percent and 5 percent, respectively. Mahler et al. (2020) use the January 2020 GEP growth forecasts (World Bank 2020a) for the pre-COVID-19 scenario in 2019. They thus find a difference in projected poverty rates under the pre-COVID-19 and COVID-19 scenarios in 2019. To calculate the number of additional poor attributable to COVID-19 in 2020, they use a difference-in-differences methodology. Here, it is sufficient to use the raw difference between the pre-COVID-19 and COVID-19 scenarios for 2020.

- The pandemic will lead to the first increase in global poverty since the 1998 Asian financial crisis, when global poverty increased by 0.4 percentage point and 47 million people were pushed into extreme poverty relative to the previous year.

https://www.worldbank.org/en/publication/poverty-and-shared-prosperity

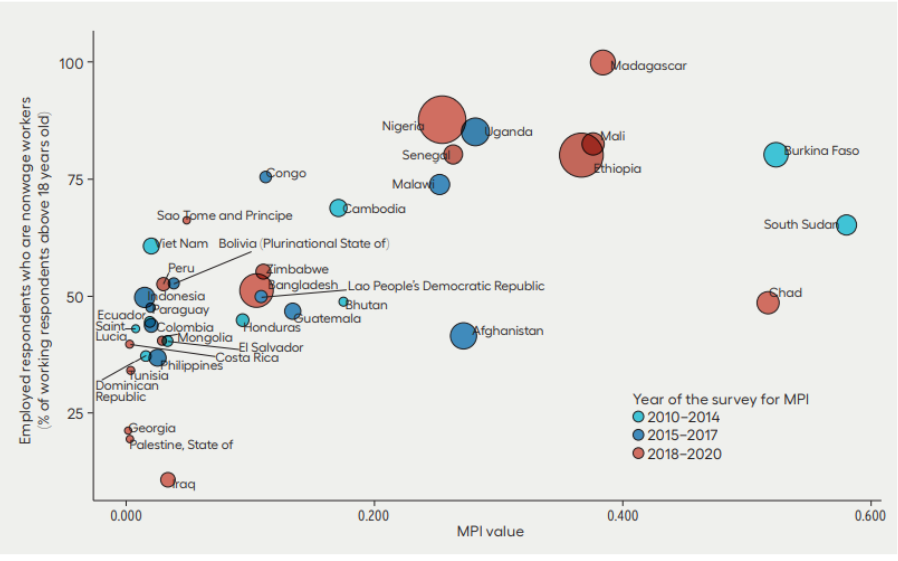
# Poverty trends with COVID-19

**Figure 3. Emergency social protection during the COVID-19 pandemic has been less prevalent in countries with high Multidimensional Poverty Index values**




**Note:** The size of the bubble is proportionate to the country's population.
**Source:** Authors' calculations based on table 1 at the end of this publication and the World Bank's COVID-19 Household Monitoring Dashboard (https://www.worldbank.org/en/data/interactive/2020/11/11/covid-19-high-frequency-monitoring-dashboard, 17 May 2021 version).

**Figure 4. A large percentage of employed people in countries with high Multidimensional Poverty Index values are nonwage workers**



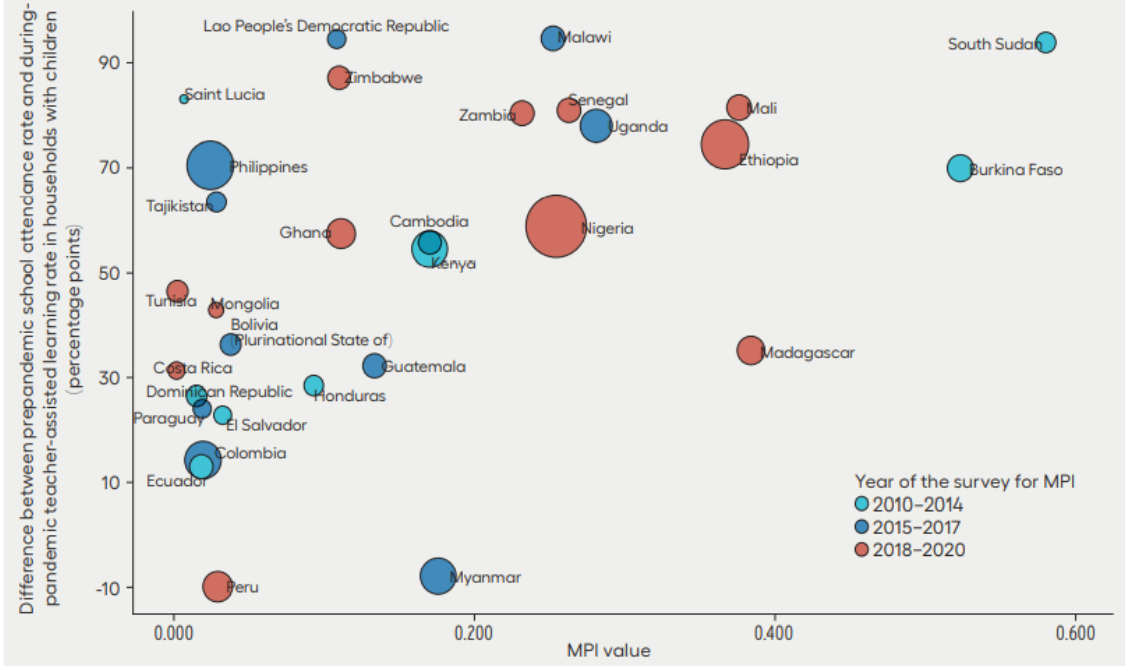

**Note:** The size of the bubble is proportionate to the country's population.
**Source:** Authors' calculations based on table 1 at the end of this publication and the World Bank's COVID-19 Household Monitoring Dashboard (https://www.worldbank.org/en/data/interactive/2020/11/11/covid-19-high-frequency-monitoring-dashboard, 17 May 2021 version).

- Emergency social protection coverage is less prevalent in high-MPI countries.
- The percentage of employed nonwage workers is particularly high in high-MPI countries.

https://ophi.org.uk/global-mpi-2021/

# Poverty trends with COVID-19

**Figure 5. The reduction in formal education activities during the COVID-19 pandemic has been higher in countries with high Multidimensional Poverty Index values**




**Note:** The size of the bubble is proportionate to the country's population. A positive value indicates a reduction in the percentage of children engaged in formal education since the start of the COVID-19 pandemic. Georgia is excluded from this figure because of data inconsistencies.
**Source:** Authors' calculations based on table 1 at the end of this publication and the World Bank's COVID-19 Household Monitoring Dashboard (https://www.worldbank.org/en/data/interactive/2020/11/11/covid-19-high-frequency-monitoring-dashboard, 17 May 2021 version).

- The percentage of households with children who stopped participating in formal education during the pandemic is larger in higher MPI countries.

# Poverty trends with COVID-19

- People who are currently poor or vulnerable are being hit especially hard. These people include those with lower levels of education and assets, those in insecure employment, and those in lower-skilled occupations.
- The poorest may also be hit harder because they have fewer coping mechanisms, such as savings that can cover basic needs during periods of unemployment. In developing countries, inadequate social security systems may fail to compensate for this differential impact of the pandemic.
- People forced into poverty by COVID-19 may also differ from the current global poor in other ways.
- Within countries, a large share of the extreme poor are rural, whereas many of the new poor are likely to live in congested urban settings, which can serve as a conduit for infection.
- Many of the new poor are likely to be engaged in informal services, construction, and manufacturing – the sectors in which economic activity is most affected by lockdowns and other mobility restrictions as well as mandatory social distancing.
- The new poor who are 15 and older are also more likely to be paid employees and work more in nonagriculture (manufacturing, services, and commerce sectors) than the chronic poor.
- The new poor tend to be more educated than the chronic poor, and significantly less educated than the nonpoor (of those age 15 and older).