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EQUITABLE GROWTH, FINANCE & INSTITUTIONS INSIGHT

A Roadmap for Countries Measuring Multidimensional Poverty

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ABSTRACT

Traditional measures of poverty have focused on income or expenditure based on a minimum threshold required to purchase a basket of essential goods and services. However, important aspects of well-being might not be fully captured through monetary measures alone. Multidimensional poverty measures seek to address this shortfall and have been adopted as an official indicator for the United Nations 2030 Agenda and its Sustainable Development Goals (SDGs) as "SDG 1.2.2: Proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions." A particular feature of SDG Indicator 1.2.2, as opposed to others in the Global SDG Indicator Framework, is that a global methodology is not mandated, and each country is therefore expected to define its own national measure of multidimensional poverty. As custodians for SDG Indicator 1.2.2, governments are responsible for reporting their measure of national multidimensional poverty into the Global SDG Indicator database.

As partner agencies working together to support member states in their custodianship of SDG 1.2.2., UNDP, UNICEF and World Bank have jointly produced this document to offer a roadmap for governments seeking to design and adopt a measure of multidimensional poverty. The roadmap presents the rationale for developing such measures, an overview of the main approaches, and a general guideline for the steps to follow. Through real country examples, the document highlights many possible outcomes of the decision-making process required to adopt a successful measure of multidimensional poverty.

Acknowledgements—This Roadmap consolidates existing global knowledge in the field of multidimensional poverty, both within international agencies, national governments and academia. The UNDP's BPPS Inclusive Growth Team, UNICEF's Division of Data, Analysis, Planning, and Monitoring, World Bank's Poverty and Equity Global Practice collaborated in the preparation of this document.

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Executive summary

Measures of multidimensional poverty aim to capture deprivations beyond income and consumption expenditures, taking into consideration other aspects of life such as living conditions, education, and health. Measures of multidimensional poverty vary greatly from country to country, and many countries have yet to adopt one. This roadmap introduces the concept of multidimensional poverty and six steps common to various multidimensional poverty measurement efforts applied by diverse countries. Practical examples and literature references to help guide the creation of a national measure for any interested government are provided. The roadmap does not intend to prescribe one way to measure multidimensional poverty, but rather it seeks to provide guidance for any country seeking to adopt such a national measure.

The process of creating a measure of multidimensional poverty should enjoy solid government backing and coordination with different ministries and stakeholders, ensuring that the process and final measure are seen as legitimate, transparent, and relevant. A technical team, including the National Statistics Office, may be established to lead this effort and work with the other line ministries and relevant agencies throughout the process. The agreed upon measure should be institutionalized to avoid susceptibility to changes in administrations or political climate. Countries are in charge of defining their own multidimensional poverty measure, data collection, and reporting.

The measurement of multidimensional poverty requires first the identification of the poor and then the aggregation of this individual-level (or household-level) data into a summary measure for the country. Such a metric is typically compiled from multiple indicators that assess individual or household deprivations in selected aspects of lived experiences called “dimensions.” Measuring multidimensional poverty requires a series of steps, including defining a set of relevant dimensions and associated indicators, deciding appropriate thresholds for deprivation for each indicator, defining the method and thresholds for deciding who will be considered poor given selected indicators, and aggregating the data across individuals or households to get a measurement of multidimensional poverty for the country. The headcount ratio is most commonly adopted as a summary measure of the proportion of the population (measured at household or individual level) considered to be multidimensionally poor and the one to be reported under SDG 1.2.2. It is also possible, but not required under SDG 1.2.2, to measure the depth of multidimensional poverty (the average number of deprivations among those considered to be multidimensionally poor) and the adjusted headcount ratio (the product of the headcount ratio and the depth of multidimensional poverty).

As children experience poverty differently from adults and have different needs, such as nutrition or education, countries might construct a specific measure of child multidimensional poverty that focuses exclusively on the specific circumstances of children, in addition to the national multidimensional poverty measure. Different dimensions and indicators can be incorporated into such a measure to accurately capture multidimensional child poverty.

Designing a measure of multidimensional poverty can be broken down into six steps:

1. Identifying the unit for which deprivations are measured (household or individual, children or adults or everyone irrespective of age).
2. Selecting dimensions relevant to how poverty can be experienced in the country context. This is followed by the selection of relevant, measurable, and precise indicators for those dimensions.
3. Defining the thresholds for each indicator (i.e. minimum distance to drinkable water, years of education, etc.) to determine when a person (or household) would be considered deprived.
4. Adding up the deprivations across indicators for each person (or household).
5. Defining who is considered multidimensionally poor by selecting a "poverty cut-off" related to the number of deprivations a person (or household) has.
6. Adding up the number of persons (or households) considered to be multidimensionally poor.

A data source or sources must be chosen to provide the relevant information for the desired dimensions and indicators, usually a multi-topic household survey. Dimensions and indicators may have to be revised based on the chosen data source. If a suitable data source does not exist, an existing data source may be modified, or a new survey could be designed to serve this specific purpose. In choosing data sources, due consideration should be given to data collection frequency, to build time series that make it possible to track progress in reducing multidimensional poverty over time.

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Introduction

In 2015, world leaders adopted the Sustainable Development Goals (SDGs). The first of these goals is to "end poverty in all its forms everywhere." To track progress towards this goal, countries have committed to report on SDG Indicator 1.2.2, which measures the "proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions." This is the only SDG indicator for which the custodians are the national governments rather than an international agency. In order to enable and facilitate the reporting of SDG Indicator 1.2.2, UNDP, UNICEF and the World Bank have partnered to provide a reporting channel for countries that have expressed readiness to report on this indicator, as well as to provide coordinated support to countries to help them meet the reporting requirements.

Although some countries already have national measures of multidimensional poverty, most have yet to create such a metric. To report on SDG Indicator 1.2.2, countries must have a national measure of multidimensional poverty that can be disaggregated by gender and age group. Countries might choose to go a step further and construct, in addition to the national multidimensional poverty measure, a measure of child multidimensional poverty that focuses exclusively on the specific circumstances of children.

In order to assist governments seeking to implement a measure of multidimensional poverty, the partner agencies prepared this roadmap. This document provides an introduction to the process of designing a multidimensional poverty measure, identifies the main steps and options available in the process of developing a national measure, and provides some examples. The country examples provided are not intended to offer prescriptive guidelines, but simply to illustrate how this process has been applied in different contexts so that users can learn from these experiences.

This roadmap covers the following topics:

- **Section 2:** Motivation – the rationale for developing a multidimensional poverty measure
- **Section 3:** Process – how to develop a multidimensional poverty measure
- **Section 4:** Methodology – how to identify the poor and aggregate the measure, including practical country examples
  - » **Highlight 1:** Unmet Basic Needs
  - » **Highlight 2:** Multidimensional Poverty Measurement in Mexico
  - » **Highlight 3:** At Risk of Poverty or Social Exclusion
  - » **Highlight 4:** Alkire-Foster Approach to Multidimensional Poverty
  - » **Highlight 5:** Child Poverty
- **Section 5:** Design – how to select the dimensions and construct the indicators for a multidimensional poverty measure
- **Section 6:** Data – how to select data sources

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Motivation

Traditionally, poverty has been measured based on income (or consumption). An individual is considered poor if her income (or value of consumption) is below a minimum threshold required to be able to purchase a basket of essential goods and services. However, important aspects of well-being (or more precisely, material living standards) might not depend on one's income. Consider two families with the same level of income. The first family lives in a house with access to piped water, a private toilet connected to the public sewer system, and electricity. The other family lives in an area without this basic infrastructure. They have to spend time fetching water, they use a communal latrine, and they buy charcoal to cook and heat their house. Although everyone would agree that the first family enjoys a higher level of material well-being, this difference would not be reflected in a monetary poverty measure.

Monetary measures of poverty may, therefore, not show the complete picture. Some services and goods that matter to people are provided or subsidized by the government, such as infrastructure, education, and health, or are public goods, such as a clean environment and security. A more accurate portrait of poverty requires also measuring non-monetary deprivations.

A first approach to measuring multiple dimensions of poverty is to assess the level of deprivation in each dimension separately, producing a dashboard of indicators. Based on this approach, the income poverty rate is reported alongside indicators of deprivations in other poverty dimensions, such as the percentage of undernourished people, the illiteracy rate, and the percentage of people without access to improved sanitation.

While dashboards can convey information on many dimensions of poverty, they cannot reflect the extent of overlap in deprivations. Suppose a country presents the following indicators: the income poverty headcount rate is 30 percent, the share of undernourished people is 30 percent, and the proportion of individuals without access to improved sanitation is also 30 percent. What is the share of people experiencing more than one deprivation? It is impossible to say. It may be the case that no person has more than one deprivation or, at the other extreme, that the same 30 percent of people experience the three deprivations at the same time. A dashboard of indicators alone would be unable to distinguish between these two very different scenarios.

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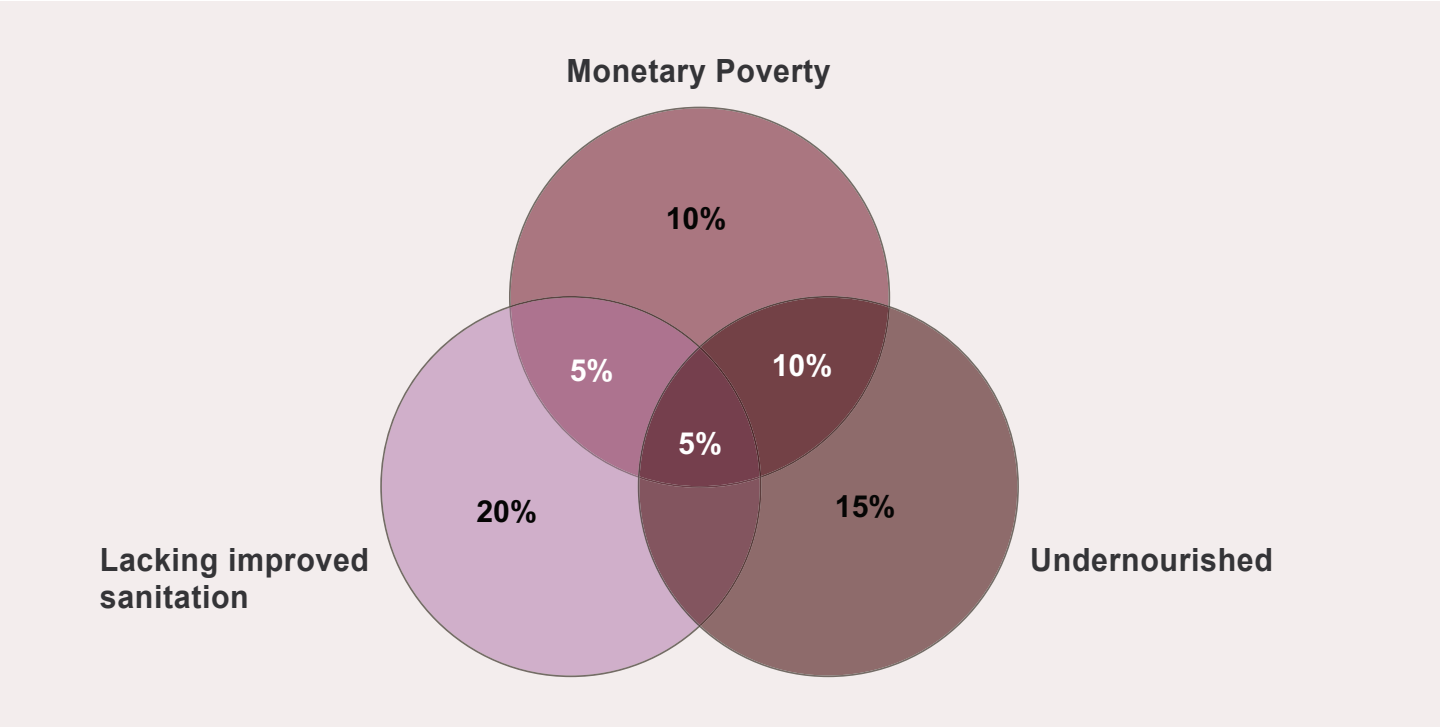
FIGURE 1 - Example of diagram. Share of people in multidimensional poverty.



One way of depicting the overlap in deprivation is using a diagram such as the one below. In Figure 1, each circle represents the share of people experiencing a type of deprivation, with its size corresponding to the total proportion in the population. The overlap of the circles represents the extent to which people experience various deprivations at the same time. Using the example mentioned before, the numbers within each circle add up to 30 percent, the share of people deprived in each indicator. But the diagram also tells us that 20 percent of them suffer more than one deprivation (the sum of the numbers in the overlapping areas), and only 5 percent of the people are deprived in all three indicators (where all three circles overlap). But what percentage of people are multidimensionally poor? The Venn diagram alone cannot answer that question. We need a rule to identify those who are multidimensionally poor (i.e. those who are simultaneously deprived in the three dimensions or those who suffer at least one deprivation among the multiple dimensions).

>>> FURTHER READING:

- For examples of using the diagram approach to depicting multidimensional poverty see, for instance, EU-Eurostat "At Risk of Poverty or Social Inclusion" and Chapter 4 of the *World Bank 2018 Poverty and Shared Prosperity Report*.
- For an overview of general approaches to assess multidimensional poverty, including the dominance approach, the statistical approaches, and the fuzzy set approaches see, for example, Ferreira and Lugo (2013) and Chapter 3 of Multidimensional Poverty Measurement and Analysis as well as Boltvinik (1998) "Poverty Measurement Methods—An Overview."

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Process

A successful measure of multidimensional poverty should be rigorous, institutionalized, sustainable, and useful. Such a measure generates credible and relevant information, and it is established as an official permanent statistic alongside traditional ones such as the income or expenditure poverty headcount and poverty gaps. As with other indicators, it is important that a clear and transparent system be in place for the regular updating of the measurement. This implies that the responsibility for these updates is assigned to an official entity and that associated costs are incorporated in the government's budget. Ideally, a multidimensional poverty measure could be used actively to guide policy-making (e.g. policies coordination, targeting, and policy evaluation).

To make such a measure institutional and useful, it is fundamental for the government to own the process. Having the support of high-level representatives within the government, such as the president or prime minister, or ministers, grants additional legitimacy to the process and may facilitate the adoption of the measure by other levels of government and stakeholders. In addition, a high-level official may be able to bring other relevant actors into the design process and work on the institutionalization of the measure. The active participation of different ministries in the discussions and decisions throughout the process of design, namely the selection of indicators, respective cut-offs, and weights, is essential to ensure that the final measure meets the needs of policy makers in a specific country context.

WHO LEADS THIS EFFORT?

Producing a technically rigorous measure requires securing a technical team with the relevant skills and expertise. Typically, the National Statistics Office or a technical team within one of the ministries (e.g. planning, economy or social development) should lead the technical process. The National Statistics Office, even when not leading the technical process, should be closely involved because of its role in collecting data and its expertise in producing official statistics.

BOX 1: ROLE OF THE CONGRESS IN MEXICO

In Mexico, the Congress launched the process of developing a national measure of multidimensional poverty with the Law of Social Development, enacted in 2004 with the support of all political parties. This law set the foundation for the process by doing the following:

- It created an autonomous government institution to lead the process of defining and measuring poverty, the *Consejo Nacional de Evaluación de la Política de Desarrollo Social* (CONEVAL);
- It established that the measurement of poverty had to reflect income and access to the social rights defined in the Constitution;
- It determined the required frequency of the measurement (every two years at the state level and every five years at the municipal scale); and
- It stated that the measurement should be based on data generated by the national statistics office, *Instituto Nacional de Estadística y Geografía* (INEGI).

To make a measure long-lasting, rather than specific to a particular administration, it is useful to build consensus and a shared sense of legitimacy around the measure that transcends individual political actors. This requires that the process of developing the measure is perceived as credible, transparent, and non-partisan. Engaging key stakeholders, such as academics, opinion leaders, the opposition, and civil society representatives throughout the process is highly desirable. This should include wide consultations with the public, for example through nationally representative surveys to capture the national consensus about the minima required to satisfy different dimensions. In addition, it is important to have a well-designed communication strategy to explain the concept and the process to these different actors, allowing for channels for them to participate in the discussions about the design of the measure. Some countries have opted for involving a poverty committee that gathers experts and representatives from different sectors of society in the decision process of designing the measure.

More specifically, the design of a measure of multidimensional poverty generally involves a technical process, complemented and supported by a political process. If both technical and political committees are set up, it is useful to agree on: (1) a plan of activities and timeline; (2) a schedule of regular interactions to ensure good communication; and (3) a documentation system that keeps track of all decisions and respective rationales. However, political interference in the technical process should be avoided, as recommended by the UNSD National Quality Assurance Frameworks Manual for Official Statistics.

BOX 2: ROLE OF EXPERTS' COMMITTEES IN CHILE

In 2012, when the credibility of the Chilean poverty data was under attack, the President, Sebastian Piñera, formed the Presidential Advisory Commission of Experts to Update the Poverty and Extreme Poverty Lines. Its mission was to brief the President on issues related to poverty measurement and to offer proposals. This commission, which included people from academia, NGOs, multilateral organizations, and the government, engaged in discussions with a broad group of people, from different sectors of the society. In January 2014, the commission submitted its report to the President, proposing the revision of the monetary poverty line and the creation of a measure of multidimensional poverty.

Following the elections, in March 2014, the government changed. The new Ministry of Social Development and the Institute of National Statistics established the Interinstitutional Technical Panel. This new panel of experts examined the proposal of the Commission and made slight revisions.

Source: Adapted from article published in Dimensions magazine (2017).

Overview of the reporting process for SDG Indicator 1.2.2

The UN Statistical Commission has adopted Guidelines on Data Flows and Global Data Reporting for the SDGs, which aim to establish efficient and transparent mechanisms for reporting on SDG data from national to international levels. The guidelines define a framework for national and international agencies to work together to improve the transmission and validation of SDG data at the global level.

The Statistical Commission sets these guidelines under the overarching Fundamental Principles of Official Statistics and the Principles Governing International Statistical Activities, emphasizing in particular the principles of transparency, collaboration and communication, and professional and ethical standards.

The guidelines mandate that SDG indicators be based on data produced and owned by national statistical systems, and that national statistical offices play a central coordinating role in the reporting process. The guidelines outline the roles and responsibilities of entities involved in the compilation of SDG data for global reporting, including National Statistics Offices (NSOs), other national institutions, and international organizations.

At the national level, the NSO, as coordinator of the National Statistical System, is expected to identify a national data provider for each indicator and liaise between national entities and international custodian agencies. For SDG Indicator 1.2.2, the data provider would be the national entity that is leading the development and monitoring of a measure of national multidimensional poverty recognized as official by the government.

At the global level, custodian agencies are mandated to compile national SDG indicator data, to harmonize it to ensure quality, international comparability and the computation of regional aggregates, and to report (upload) the data to the Global SDG Indicator Database. In many instances, custodian agencies also support the methodological development of indicators and provide technical assistance to under-resourced national statistical systems. Custodian agencies are expected to publish a timeline of data collection activities, to ensure transparency and sufficient time for NSOs and national data providers to respond to requests for SDG data.

SDG 1.2.2 is different from other SDG indicators in two important ways. Firstly, it is nationally defined and not a uniform measure across countries, and therefore it is not internationally comparable. Secondly, its custodians are NSOs and not international agencies. Because of these characteristics, UNDP, UNICEF and the World Bank collaborate as special partner agencies to provide a platform for compiling national SDG 1.2.2 data and reporting it to the global SDG database, a function typically performed by custodian agencies. While the special partner agencies strive to ensure that reported data is official and of good quality, they do not perform any harmonization or other processing of the data. The Guidelines on Data Flows and Global Data Reporting for the SDGs also require that national metadata be submitted at the same time as SDG data, to ensure accuracy and international comparability. The variety of methodologies for SDG Indicator 1.2.2 increases the relevance of national metadata as an instrument to ensure high quality and the accuracy of reported data. The three agencies also have extensive portfolios of technical assistance and capacity support to countries for the development of their national measures of multidimensional poverty.

As special partner agencies, UNDP, UNICEF and World Bank have developed a platform (hosted by the World Bank) to facilitate the compilation and global reporting of national data for SDG Indicator 1.2.2. As part of the process, the country teams of the three agencies work closely with the NSO and the designated national data provider to identify the official data source, ensure that the data is validated by national focal points, and report the data to the Global SDG Indicator Database.

>>> FURTHER READING:

- Guidelines on Data Flows and Global Data Reporting for Sustainable Development Goals: https://unstats.un.org/unsd/statcom/49th-session/documents/BG-Item-3a-IAEG-SDGs-DataFlowsGuidelines-E.pdf
- Criteria for the implementation of the guidelines on data flows and global data reporting for the Sustainable Development Goals: https://unstats.un.org/unsd/statcom/50th-session/documents/2019-2-IAEG-SDG-E.pdf, Annex 1
- Best Practices in Data Flows and Global Data Reporting for the Sustainable Development Goals: https://unstats.un.org/unsd/statcom/50th-session/documents/BG-3a-Best-Practices-in-Data-Flows-and-Global-Data-Reporting-for-theSDGs-E.pdf
- Section I of How to Build a National Multidimensional Poverty Index (MPI): Using the MPI to inform the SDGs and for practical experiences, Guio, A. C., Gordon, D., Najera, H., and Pomati, M. (2017) Revising the EU material deprivation variables and European Union (2012) Measuring material deprivation in the EU: Indicators for the whole population and child-specific indicators: http://ec.europa.eu/eurostat/documents/3888793/5853037/KS-RA-12-018-EN.PDF

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Methodology

The measurement of poverty involves two crucial steps: (1) identification – identifying who is poor, and (2) aggregation – compiling the individual's information into a summary measure. There are different ways to perform these two steps. All measures currently being estimated by countries or multilateral organizations use the counting approach. Therefore, what follows relates only to counting approaches, even if other non-counting methodologies have been developed by experts.

The identification and aggregation of the multidimensionally poor involves the following steps:

1. Define the set of relevant dimensions of poverty, and for each of these define a set of indicators.
2. For each dimension, determine the criteria to assess deprivation based on the indicators.
3. For each indicator, define a satisfaction threshold, such that a person (or household) with an achievement below the threshold will be identified as deprived in that indicator.
4. For each indicator, compare each person's (or household's) achievement with the satisfaction threshold and create a variable that assumes, for example, the value 1 if the person is deprived in that indicator and 0 otherwise, and then classify them as either deprived or not in that indicator.
5. For each individual (or household), sum up the number of deprivations. In the summation, each indicator can be weighted differently or equally. Typically, if there are more indicators in one dimension than in others, indicator weights are adjusted to ensure equal weights across dimensions, but this need not be the case.
6. Define a poverty cut-off, such that a person exceeding the cut-off will be identified and counted (aggregated) as poor.
7. Aggregate up across individuals (or households) to obtain a measurement of multidimensional poverty for the country or region of interest.

To illustrate this method, suppose a hypothetical society with five people, where multidimensional poverty is measured based on four indicators: per capita household income, years of schooling, access to sanitation, and access to source of water. The deprivation thresholds for these indicators are, respectively: 400 monetary units (e.g. dollars, pesos, shillings), 5 years of schooling for adults, having access to improved sanitation, and having access to improved sources of water. In this example, the four indicators are weighted equally, and the multidimensional poverty cut-off is two out of the four indicators. That is, the person would be considered poor if she is deprived in at least two out of the four indicators. Table 1 presents the individuals' achievements in each of the four relevant indicators, and the deprivation cut-offs are shown in the bottom row. The achievements falling below the deprivation thresholds are highlighted in red. Table 2 shows the deprivation status of all individuals in the four indicators. Column (5) shows the sum of deprivations. Comparing this sum with the poverty cut-off (as mentioned above, two out of four) the individuals can be classified as poor and non-poor, as shown in column (6).

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TABLE 1 - Individual achievements in the variables selected to define multidimensional poverty

INDIVIDUAL	INCOME (IN DOLLARS)	SCHOOLING (IN YEARS OF EDUCATION)	IMPROVED SANITATION	IMPROVED WATER
1	**100**	**3**	**No**	**No**
2	**200**	**2**	**No**	Yes
3	**350**	5	Yes	Yes
4	500	**4**	Yes	**No**
5	600	6	Yes	Yes
DEPRIVATION CUT-OFFS	400	5	Yes	Yes

Note: Please note that the water and sanitation indicators are binary variables where a value of 1 corresponds to having access to an improved sanitation or water source, and is 0 otherwise.

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TABLE 2 - Deprivation status, deprivation score and poverty status

INDIVIDUAL	DEPRIVED IN...				SUM OF DEPRIVATIONS	POOR (AT LEAST TWO OUT OF FOUR)
	INCOME	SCHOOLING	SANITATION	WATER		
	(1)	(2)	(3)	(4)	(5)	(6)
1	**1**	**1**	**1**	**1**	4	**Yes**
2	**1**	**1**	**1**	0	3	**Yes**
3	**1**	0	0	0	1	No
4	0	**1**	0	**1**	2	**Yes**
5	0	0	0	0	0	No

The last step involves aggregating the information across individuals. The most common summary measure is the headcount ratio or incidence of poverty. The headcount ratio is the proportion of the total population classed as poor. In the example above, the incidence of multidimensional poverty is 60 percent (=3/5×100). All empirical examples discussed in this section use the headcount ratio as the core measure of multidimensional poverty. On one hand, this measure is very intuitive and can be disaggregated by population sub-groups. On the other hand, it cannot be broken down by the contributions of each different indicator and it is not sensitive to the number of deprivations experienced by the poor. Because of these limitations, some methodologies propose other summary measures in addition to the headcount ratio. For the purpose of reporting on SDG Indicator 1.2.2, countries only need to compute the headcount ratio.

Highlight 1: Unmet Basic Needs

The measures of Unmet Basic Needs (UBN), which proliferated in Latin America in the 1980s, are a direct application of the counting approach.[1] These measures often use census data to produce detailed maps of poverty and can also be estimated using household surveys. They identify the poor using the counting approach as described above, following all the steps mentioned, and aggregate the information across households and people using incidence ratios. Most generally, the share of households or individuals with unmet basic needs is presented for different poverty cut-offs – that is, the proportion of households and people with one or more unmet basic need, the proportion of households and people with two or more unmet basic needs, and so on. The basic needs considered in these measures usually include (Feres and Mancero, 2001): access to housing that meets minimum housing standards, access to basic services that guarantee minimum sanitary conditions, access to basic education, and economic capacity to achieve minimum consumption levels. When these measures are estimated using census data, they can be highly disaggregated geographically, which makes it possible to construct detailed maps of poverty at district, municipality and even census ratio levels. Because of this property, maps of unmet basic needs have sometimes been used to allocate resources across areas.

Highlight 2: Multidimensional Poverty Measurement in Mexico

The counting approach has been used to assess the number of people that are deprived simultaneously in income and in some non-monetary dimensions.[2] Early applications can be found in Ireland, and more recently, in the United Kingdom for measuring child poverty.[3] But the first country to develop an official and permanent measure of multidimensional poverty in the developing world was Mexico. The National Council for Evaluation of Social Development Policy (CONEVAL) led that process. In Mexico, multidimensional poverty is measured in the space of economic well-being and social rights, at the individual level:

> "A person is considered to be multidimensionally poor when the exercise of at least one of her social rights is not guaranteed and if she also has an income that is insufficient to buy the goods and services required to fully satisfy her needs." (CONEVAL, 2010)

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TABLE 3 - Dimensions and indicators of the measure of multidimensional poverty of Mexico

TYPE OF DIMENSION	DIMENSION	INDICATOR
ECONOMIC WELL-BEING	Economic well-being	Income per capita
SOCIAL RIGHTS	Education	Educational gap (meeting a minimum level of education for their age cohort)
	Health	Enrolled in the Social Health Protection System
	Social security	Access to social security
	Housing	Quality and spaces of dwelling (floor, roof, walls, and overcrowding)
	Services in the dwelling	Access to basic services in dwelling (water, drainage, electricity, cooking fuel)
	Food	Food security

1 This approach was proposed in several publications before being adopted widely in Latin America. See, among others: ILO (1978), Morris (1978) and Streeten et al. (1981).

2 Early examples of analyses using this approach include, for instance, Beccaria and Minujín (1985), Minujin, A. (1995), and Erikson, R (1989).

3 In Ireland, since 1997 "consistent poverty" is defined as the proportion of people who are both income-poor and cannot afford at least two of the set of items considered essential for a basic standard of living (previously 8, now 11 items are considered as essential). Since 2010, the United Kingdom applies a similar definition for one of its four policy targets on child poverty, combining low income and material deprivation (The Child Poverty Unit, 2014). See also Aaberge and Brandolini (2014).

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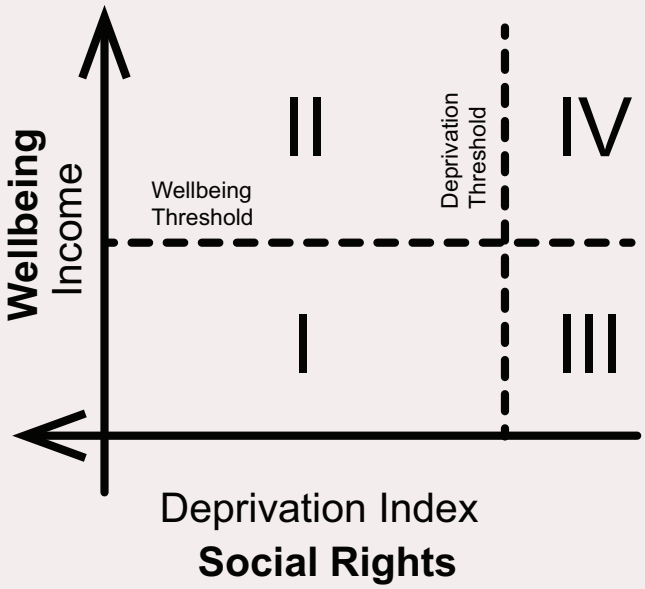
FIGURE 2 - Identification of the multidimensionally poor in Mexico



Source: Adapted of CONEVAL (2010).

All persons whose income per capita is insufficient to cover necessary goods and services are considered deprived in economic well-being. For social rights, each of the six indicators in Table 3 is generated as a binary variable, with 1 representing deprivation, and 0 otherwise. In the cases in which there is more than one indicator, that is, for housing and access to services in the dwelling, the individual is classified as deprived if she fails to meet the threshold for any single indicator within the dimension. The social deprivation index is then defined as the sum of these six indicators associated with social deprivation. The six dimensions are equally weighted, as all human rights are considered equally important. The social deprivation index thus takes a value between zero (the person is not deprived in any of the six social rights indicators) and six (the individual is deprived in all of them).

The classification of the population according to this method is illustrated in Figure 2. The vertical axis represents the space of economic well-being, measured by per capita household income. The horizontal axis represents the space of social rights. In this axis, individuals at the origin have a social deprivation index of six, individuals placed more to the right have fewer deprivations. The deprivation cutoff in the space of social rights is one, and individuals to the left of this threshold or on this threshold are considered to be deprived in social rights. People are divided into four groups (CONEVAL 2010, p. 32):

I. **Multidimensionally poor.** People with an income below the economic well-being threshold and with one or more unfulfilled social rights.

II. **Vulnerable due to social deprivation.** Socially deprived people with an income higher than the economic well-being threshold.

III. **Vulnerable due to income.** Population with no social deprivations and with an income below the economic well-being threshold.

IV. **Not multidimensionally poor and not vulnerable.** Population with an income higher than the economic well-being threshold and with no social deprivations.

Among the multidimensionally poor, those in extreme poverty are also identified, by considering a lower economic well-being threshold (the minimum economic well-being threshold)[4] and a higher deprivation threshold of three of more social deprivations.

In terms of aggregation, Mexico produces several categories of summary measures. The core measure is the headcount ratio, that is, the proportion of people who are multidimensionally poor (i.e. the proportion of people in group I in Figure 2). In addition, other headcount measures are also reported, such as the proportion of people deprived in economic well-being, the proportion deprived in each of the social rights, and the proportion showing one or more social deprivations. The depth of poverty is computed separately with respect to economic well-being and social deprivations. The depth of poverty in terms of economic well-being is the average gap between the well-being threshold and the income of poor people.[5] This measure is reported for groups I and III in Figure 2. The depth of poverty in terms of social deprivations is the average proportion of deprivations among those suffering at least one deprivation. This measure is reported for groups I and II in Figure 2. Finally, the intensity of poverty corresponds to the product of the headcount ratio and the depth of poverty.[6] This measure is computed for the multidimensionally poor (group I) and the socially deprived (group II).

In 2015, Vietnam launched their official multidimensional poverty index, following an approach similar to the one adopted in Mexico but using the household as the unit of analysis. A multidimensionally poor household is a household (1) whose monthly average income per capita is at or below income-based poverty line, OR (2) whose monthly average income per capita is above income-based poverty line but below minimum living standard AND is deprived on at least 3 indices for measuring deprivation of access to basic social services. Ten indicators are included in the list of basic social services. These are (1) adult education, (2) child school attendance, (3) accessibility to health care services, (4) health insurance, (5) quality of house, (6) housing area per capita, (7) drinking water supply, (8) hygienic toilet/latrine, (9) use of telecommunication services, and (10) assets for information accessibility.[7]

Highlight 3: At Risk of Poverty or Social Exclusion

Since 2010, the European Union's economic strategy set the headline target on poverty for 2020 to "20 million less people should be at risk of poverty." Progress against this target is measured with the rate of people at risk of poverty or social exclusion (AROPE), defined as the proportion of people that are either at risk of monetary poverty, or are living in a household with very low work intensity, or are severely materially deprived. In other words, AROPE considers three dimensions/indicators, and the individual is at risk of poverty or social exclusion if she is deprived in at least one of those dimensions/indicators.

An individual is at-risk-of-poverty if:

1. She has an equivalized disposable income (after social transfers) below 60 percent of the national median equivalized disposable income after social transfers.
2. Lives in a household with very low work intensity (i.e. if the ratio of the total number of months that all working-age household members have worked during the income reference year to the total number of months they theoretically could have worked is less than 20 percent).
3. Is severely materially deprived, that is if she cannot afford at least four of the following nine items:
   - to pay the rent, mortgage or utility bills
   - to keep the home adequately warm
   - to face unexpected expenses
   - to eat meat or proteins regularly
   - to go on holiday
   - a television set
   - a washing machine
   - a car
   - a telephone

4 The economic well-being threshold was defined with reference to a basket of basic goods and services. The minimum economic well-being threshold is the minimum required income to acquire enough food to ensure adequate nutrition.

5 Foster, Greer and Thorbecke (1976).

6 Following Alkire and Foster (2007).

7 Vietnam General Statistics Office. https://www.gso.gov.vn/en/metadata/2019/10/explanation-of-terminology-content-and-methodology-of-some-statistical-indicators-on-living-standard/

The information on the individuals at risk of poverty and social exclusion is aggregated in the form of an incidence rate, the proportion of individuals in the total population that are identified as being at risk of poverty or social exclusion.

The construction of AROPE follows the same steps outlined above that are used in the UBN or mixed (CONEVAL) experiences. In addition, as in the two other highlighted cases, the three dimensions are equally weighted. However, while CONEVAL takes as deprived in social rights as those suffering from at least one deprivation in any indicator within this dimension, AROPE requires that within material deprivation at least four deprivations out of nine are needed for establishing severe material deprivation.

Highlight 4: Alkire-Foster Approach to Multidimensional Poverty

Alkire and Foster presented a family of multidimensional poverty measures based on the counting approach, which has captured global attention and is being widely adopted by countries. The first and most well-known application is the UNDP-OPHI Multidimensional Poverty Index (MPI) at the global level, which has been published since 2011. Since then, many countries have followed their guidance in what is known as "the MPI approach."

The Alkire-Foster family of measures follows the five steps of counting approaches described above and the two stages of identification and aggregation: (1) there is a first cut-off for each deprivation-specific threshold, and (2) there is second cut-off at the aggregation stage to determine whether the person (or household) is multidimensionally poor based on the deprivation score. Differential weights are sometimes used at the aggregation stage, but they are not mandatory. This results in an estimate of the incidence or prevalence of poverty, which is usually referred as H.

An innovation introduced by the Alkire-Foster family of measures is that it is possible to account simultaneously for both the incidence of poverty (H), as well as its intensity (A).[8] The intensity of poverty – also called breadth of poverty – is defined as the average proportion of the relevant multidimensional poverty indicators (weighted or not) in which the poor are deprived. When using categorical variables, it is possible to estimate an adjusted headcount ratio (M_0 or MPI), where

$$M_0 = H \times A .$$

The adjusted headcount ratio, just like the other measures described in this note, can be disaggregated by population subgroups (e.g. geographic area, ethnicity), and it can be broken down by dimension or indicator. For more details on the methodology, see Alkire et al. (2015).

The Alkire-Foster approach can be seen as a general framework to measure multidimensional poverty that can be tailored to very different contexts. Many of the existing permanent national statistics of multidimensional poverty are based on the global MPI, but with substantial modifications in terms of dimensions, indicators, and thresholds.[9] Since 2018, the World Bank regularly presents multidimensional poverty measures across countries using the headcount ratio (H), as is done by UNDP-OPHI measure, albeit with differences in the selection of parameters, some of the indicators, and sources of data. Table A. 1 in the annex presents a comparison of indicators used in both global measures. In addition to the headcount ratio, the 2018 Poverty and Shared Prosperity report, where the World Bank introduced this multidimensional measure, presents estimates of global poverty using the adjusted headcount ratio of the Alkire-Foster family as well as the distribution-sensitive multidimensional poverty measure, proposed in Datt (2018).

8 The formula developed by Datt and featured in the 2018 Poverty and Shared Prosperity report by the World Bank, also allows for a combination of incidence and breadth of poverty. There are several other formulae which allow this combination.

9 For information on these measures, visit the website of the Multidimensional Poverty Peer Network (MPPN), www.mppn.org. The MPPN was launched in 2013 to provide support to policy makers who are implementing a Multidimensional Poverty Index (MPI) or are exploring the possibility of developing multidimensional measures of poverty.

Highlight 5: Child Poverty

Children experience and suffer poverty differently than adults. Their needs are also different, for example in terms of nutrition or education. However, children are often invisible in poverty estimates. That is why the SDG 1.2.2 explicitly mentions children and why countries should establish a child-specific measure of child poverty. The European Conference of Statisticians recommends that countries "develop child-specific and life-cycle adapted multidimensional poverty measures" (Recommendation 29).

If child-specific poverty measures are not developed, there is a risk of misinterpreting the evolving situation of children and consequently misinterpreting the impact of policies and external shocks. It is possible that while the situation of children in a given household deteriorates, that household becomes "non-poor" due to indicators that matter only for adults. In such a case, despite the fact that these children are worse-off than they were before, they would no longer be counted as poor.

Over 70 low- and middle-income countries which have carried out child poverty analyses based on a child-specific measure of child poverty use the child as the unit of analysis. These countries are in all regions of the developing world, (e.g. Argentina, Armenia, Brazil, Egypt, Ethiopia, Mexico, Sierra Leone, Uganda, and Zambia), as well as in the European Union.

Estimating multidimensional child poverty follows the same steps as the other examples mentioned above: the relevant dimensions are identified, criteria to assess deprivation in each dimension are established, and deprived children in each dimension are identified. A threshold is then specified concerning the minimum number of dimensions in which a child must be deprived to be considered poor, and children above or below this threshold are then counted. Moreover, the percentage (and number) of children deprived in exactly one, exactly two, exactly three, et cetera, deprivations are reported and analyzed, as well as the overlaps or simultaneous deprivations. This makes it possible to measure the incidence, the breadth, and the severity of poverty in a simple and integrated way.

For child poverty, the selection of dimensions should be based on child rights. However, not all rights constitute child poverty, as explained in the Guidelines on Human Rights and Poverty from the Office of the High Commissioner for Human Rights. According to the Conference of European Statisticians: "Deprivation measures need to be based upon a clear and explicit theory or normative definition of poverty in order to ensure that each indicator is a valid measure, i.e. that **it measures poverty and not some other related (or unrelated) concept such as wellbeing [sic] or happiness"** (Recommendation 28 (a), emphasis added).

As in the case of CONEVAL (explicitly) and UBN (implicitly), no differential weights should be applied across dimensions because they are rights. All rights are equally important and cannot be substituted. This is not just emanating from the human rights approach, but it is also the case with capabilities approach, as stated by Dixon and Nussbaum (2012, p.554): "A Capabilities Approach is generally committed to the equal protection of rights for all up to a certain threshold. Any trade-off that leaves some people below this threshold will thus be a clear failure of basic justice under a Capabilities Approach."

Bart Verweij / World Bank

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Design

The design of a measure of multidimensional poverty consists in defining the features of the measure, namely: (1) the unit of identification; (2) the dimensions and indicators; (3) the deprivation cut-offs; (4) the aggregation across indicators, with weights (if any); (5) if a dual cut-off measure is chosen, the poverty cut-off; and (6) the method of aggregation across individuals or households.

The decisions on the design of the measure involve normative value judgements. To ensure transparency in the design of the measure, it is important to clearly identify all the normative decisions made and to document the decision-making process. There should be a record of the arguments and information that guided and justified each decision, the alternatives considered, and the reasons why they were not chosen. Transparency about these normative decisions enables a public debate, which in turn allows other stakeholders to offer input about the design and to support the legitimacy of the measure.

Prior to designing a multidimensional poverty measure, the purpose or purposes of the measure should be defined, to guide the selection of the unit of identification, the dimensions and indicators, and the periodicity of the measure. Broadly speaking, poverty measures aim to monitor the situation of poverty in the country and to inform policy design. In the context of the SDGs, one of the purposes of a national multidimensional poverty measure will be to monitor multidimensional poverty reduction among men, women, and children. Therefore, the measure or set of measures to be designed will have to be appropriate (separately or collectively) for the three groups.

(1) Unit of identification

The unit of identification refers to the level at which deprivations and poverty status are measured. Most frequently, the unit of identification is either the household or the individual. Using the individual as the unit of identification implies defining all the deprivations with reference to individuals' specific achievements (for instance, educational attainment or nutrition) or with reference to her household for household-level indicators (for instance, access to electricity). In contrast, using households as the unit of identification allows for the measurement of deprivations based on the combined profile of achievements of the household members, which implies attributing the same deprivation status to all household members. For example, anthropometric measures, when available, are usually collected for children under 5 years old and women of reproductive age. Based on that data, it is possible to define a deprivation at the household level (e.g. household deprived if at least one of its members is undernourished), but not at the individual level for the whole population (since the anthropometric data only cover a subset of individuals). However, doing so may hide what is happening within the household. If only women in the household are undernourished, but all members are counted as undernourished, gender differences have not been captured.

Besides the data limitations, the decision to use the household as the unit of identification is often based on the idea of the impact of externalities within the household, as well as on the fact that often households are the main targets of public policies. Even when the unit of identification is the household, it is good practice to report poverty figures in terms of individuals (i.e. "proportion of people that are multidimensionally poor") since household sizes vary and poorer households tend to have more members than non-poor households. In practice, most official national measures of multidimensional poverty identify poverty at the level of the household. Exceptions include the Mexican measure developed by CONEVAL and the Multidimensional Deprivation Index developed by the United States Census Bureau.[10] These individual-based measures allow for intra-household analysis.

BOX 3: RWANDA'S TWO MEASURES OF MULTIDIMENSIONAL POVERTY

The government of Rwanda has two official measures of multidimensional poverty: (1) the national Multidimensional Poverty Index (MPI), which defines poverty at the household level and is used to track multidimensional poverty among the general population; and (2) a national measure that defines poverty at the child level, to focus on the particular situation of children. Both measures were launched in 2018.

The national MPI includes four **equally-weighted** dimensions: education (with two indicators), housing (with four indicators), public services (with three indicators), and social services and economic activity (with five indicators). Given that there are different numbers of indicators per dimension, and that both the dimensions are weighted equally and the indicators within each dimension are weighted equally, the resulting weighting structure is uneven across indicators. A household is identified as poor if the weighted sum of deprivations across indicators (not dimensions) exceeds 40 percent of the potential deprivations across indicators. The national MPI is computed using the data from the Integrated Household Living Conditions Survey (known as "EICV," the acronym of its name in French).

The child-specific measure for Rwanda distinguishes four age groups: 0-23 months, 24-59 months, 5-14 years, and 15-17 years. The number of dimensions and the indicators included in each dimension vary across age groups, except sanitation, water, and housing, which are common to all age groups. A child is considered multidimensionally poor if she is deprived in at least 3 dimensions, representing 50 percent of the dimensions for children under five and 60 percent of the dimensions for children older than five. The measurement uses data from the Rwanda Demographic and Health Survey for the younger age group and the EICV for the older group.

Sources: NISR (2018) and UNICEF (2018).

10 The Multidimensional Deprivation Index developed by the United States Census Bureau is not an official measure of poverty, but is rather a research measure intended to complement the existing official measures of poverty.

>> (2) Dimensions and indicators

The dimensions of a poverty measure delimit the domains in which deprivations are measured. Conceptually, different dimensions capture different facets of poverty. In practice, dimensions are categories of indicators that facilitate the communication and the interpretation of the measure and its results (Alkire et al., 2015). In the case of child poverty, each dimension corresponds to a child right that requires material resources to be realized. The selection of dimensions depends on the scope of the measure. The set of dimensions relevant for capturing multidimensional poverty across the entire population is probably different from the set of dimensions relevant for capturing poverty exclusively among children.

The selection of dimensions is driven by normative considerations about what it means to be poor (or what it means to be non-poor). As there is no universal view of what it means to be poor, countries have relied on different processes to answer this question. Examples of types of processes that have been used to inform the decision on dimensions include deliberative or participatory exercises, legitimate consensus, and theoretical arguments. Participatory exercises engage a group of actors (ideally, representative) in the decision process. They can take the form, for instance, of online assessments or face-to-face focus groups, or the consensual approach based on household surveys. A second approach is to define the dimensions based on a document that reflects public consensus, such as a country's constitution, a national development plan, a declaration of human rights, or an internationally agreed framework such as the 2030 Agenda for Sustainable Development. The selection of dimensions might also be based on a particular conceptual framework or theory. Table 4 lists some examples of well-being dimensions proposed in the literature: the first one is based on participatory approaches, while the other three are derived from conceptual frameworks. In practice, most countries use a combination of these criteria to justify the dimensions included in their

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TABLE 4 - Dimensions of well/ill-being identified by different studies

VOICES OF THE POOR, DIMENSIONS OF ILL-BEING (2000)	MARTHA NUSSBAUM'S CENTRAL HUMAN CAPABILITIES (2007)	STIGLITZ-SEN-FITOUSSI COMMISSION, DIMENSIONS OF WELL-BEING (2009)	MEASURING GLOBAL POVERTY, DIMENSIONS OF POVERTY (2017)
MATERIAL WELL-BEING	Life	Material living standards	Nutrition
BODILY WELL-BEING	Bodily health	Health	Health status
SOCIAL WELL-BEING	Bodily integrity	Education	Education
PSYCHOLOGICAL WELL-BEING	Senses, imagination, and thought	Personal activities including work	Housing conditions
SECURITY	Emotions	Political voice and governance	Access to work
FREEDOM	Practical reason	Social connections and relationships	Personal Security
	Affiliation	Environment	
	Other species	Economic and physical insecurity	
	Play		
	Control over one's environment		

BOX 4: SELECTION OF DIMENSIONS IN EL SALVADOR

The Government of El Salvador launched their national Multidimensional Poverty Index (MPI) in October 2015. The selection of dimensions and indicators was the result of a consensus process, which began with discussions among the Advisory Group, chaired by the Technical and Planning Secretariat and UNDP, and was later complemented by focus groups across the country with poor households. Together with TECHO (a youth-based NGO in Latin America), UNDP conducted 23 focus groups during 2012.

The final MPI includes five dimensions: education; living conditions; work and social security; health, basic services and food security; and habitat. These dimensions are represented by a total of 20 indicators. The data source for the computation of the national MPI is Household Survey of Multiple Purposes (known as "EHPM," the acronym of its name in Spanish).

Sources: MPPN – El Salvador *and* Moreno (2016)

measures (see Table A. 2 for the selection of dimensions across countries). Despite the different approaches, Table 4 shows that there is considerable overlap across the dimensions of poverty selected in the design of four well-known studies.

Once dimensions are chosen, it is necessary to select the indicators to capture each specific dimension. Sometimes each indicator captures a different facet of poverty; more often, a few indicators depict the same domain of poverty (e.g. the education dimension might be captured using both years of schooling and school attendance). It is desirable for selected indicators to be easy to communicate and interpret, in order to facilitate the dissemination of the measure, as long as they are valid and reliable measures of deprivation. Although different types of indicators might be included in the measure, the preference is for outcome indicators that are objective and responsive to policy changes. Data on these indicators should be regularly collected, so the measure can be frequently updated. See Table A. 2 for a list of indicators used in national, regional, and global multidimensional poverty measures.

The decision on indicators is strongly influenced by empirical considerations. Candidate indicators need to be valid, precise, reliable, and comparable across both time and population sub-groups. While many of the theoretically valid indicators may already be included in existing surveys as they have been rigorously defined previously (for instance, unemployment rate following standard ILO guidance), sometimes adjustments to questionnaires are needed to ensure that the indicators are indeed adequate. Invariably intertwined with the decision of the indicators is the selection of the survey data source used for the computation of the multidimensional poverty index. As explained in the next section, counting-based multidimensional measures require that all the indicators are present for the same individual (or household) in the same data source. Dataset-specific issues, such as survey design, questionnaire, recall period, and missing values can significantly influence the design of indicators and the selection of the data sources.

Sometimes, the indicators need to be transformed to match the relevant unit of identification. Household-level achievements, such as access to improved sanitation, can be included in a measure with the individual as the unit of identification, by assuming that the household achievement applies to every member of that household. Individual-level achievements, such as education and employment, can be included in measures using the household as the unit of identification, by combining the individual achievements of household members into a household-level indicator. For example, in Colombia a household is considered deprived in formal employment if at least one of its economically active members does not have formal employment. It is important to note that when using an individual-based indicator for the whole household, as in the Colombia example, the population share of individuals living in a household with at least one person who works informally will differ from the share of workers having informal employment.

Data on individual achievements (e.g. anthropometric measures, employment information, school attendance) are often available only for specific sub-groups of the population (e.g. children under 5, economically active individuals, children of school age). This might happen because the achievement is only relevant for that particular sub-group (e.g. employment), or because data were only collected for that group (e.g. anthropometric measures). If the unit of identification is the household, it is possible to define household-level indicators based on the achievements of a subset of household members. For example, in Chile a household is identified as deprived in nutrition if it has at least one child under seven years old who is over-weight, obese, undernourished, or at risk of becoming undernourished. When adopting this approach, it

is necessary to define a rule to deal with households that do not have members within the eligible group (such as, in the example above, how to treat households that have no child under seven years old). So far, the common practice has been to consider them to be non-deprived.

If the unit of identification is the individual and the measure aims at covering the full population, the measure will not be able to include individual achievements with data only for sub-groups of the population, unless the measure itself is defined only for that particular group. This is the case, for instance, for child-specific multidimensional poverty measures.

One challenge of multidimensional poverty measures of children is selecting indicators of individual achievements that can be used for all ages. First, because the relevant deprivations change as children grow older. For example, immunizations are particularly important for younger children, while school attendance only becomes relevant when children reach school-age. Second, because some individual achievements that are relevant throughout all childhood (e.g. nutrition) are only measured for a sub-group of children (e.g. children under five years old). To overcome these difficulties, one can define different measures with different indicators for different age groups, such as the Multiple Overlapping Deprivation Analysis tool developed by UNICEF. Alternatively, it is possible to define or select indicators with different specifications across age groups, as in the case of Sierra Leone. Whatever strategy is used, poverty comparisons across different age groups need to be made carefully.

DEALING WITH MISSING VALUES

The incidence of missing values can also affect the construction of indicators. A missing value occurs when no data are stored for a variable in an observation that should have a response. A missing value generally implies dropping that observation from the sample, which might compromise the representativeness of the sample. To limit the risk of bias, it is recommended to select indicators for which the proportion of missing values is as low as possible.

>> (3) Deprivation cut-offs or thresholds

The deprivation cut-off of an indicator is the minimum level of achievement needed for a person to be considered non-deprived. For instance, a deprivation cut-off for years of schooling of nine years means that a person who completed less than nine years of school will be identified as deprived in this indicator.

The decision on the deprivation thresholds can be informed by national or international standards (e.g. national legislations or international conventions), by participatory or consultative exercises (e.g. focus groups with people living under poverty conditions, consultations with different experts), or by targets set by the government (such as those specified in national development plans). While the decision is normative, it is good practice to check the implications of these decisions with the data. This means that the sensitivity of the measure to the selection of different deprivation cut-offs needs to be examined, not to change the selection of the threshold but rather to understand its implications.

When the unit of identification is the household and the proposed indicator combines individual achievements from different household members and different dimensions (for instance, educational attainment, nutrition), the definition of the deprivation thresholds involves two steps. The first is to define the minimum individual achievement requirement (for instance, at least primary school, a BMI equal to or higher than 18). The second is to determine how to combine the individual-level information. A household might be considered deprived in years of schooling if no adult has completed primary school, or if any adult did not complete primary school, or somewhere in between. One advantage of poverty measures that use the individual as the unit of analysis is that they avoid the abovementioned concern.

BOX 5: SELECTION OF DEPRIVATION THRESHOLDS IN MEXICO

Mexico determined indicator thresholds on the basis of the following specific methodological criteria:

1. Apply legal norms if they exist.
2. Apply specific criteria defined by experts of specialized public institutions working on the field of each deprivation indicator.
3. Apply criteria based on statistical analysis.
4. The Executive Committee of CONEVAL shall determine the threshold, after taking into consideration the opinion of experts.

"In order to define deprivation indicators, a review of the legislation applicable to each dimension was carried out first. Where the legislation did not provide enough information to define a precise indicator of deprivation and its associated threshold, specialists in the field were consulted, especially those from official institutions devoted to generating or analyzing statistical information related to a particular social dimension" (CONEVAL 2010, page 42).

Source: CONEVAL (2010)

>> (4) Aggregation across indicators, and weights

When using the counting approach, deprivations across indicators are aggregated for each person (or household) by simply adding them up. In many cases, indicators are weighted differently, and thus, rather than a simple sum, the aggregation involves a weighted sum of deprivations.

The weight of each indicator reflects the relative importance that the presence or absence of a deprivation in that indicator has on the person's overall deprivation. There are three broad approaches to setting weights (Decancq and Lugo 2013): data driven, normative, and hybrid. Weights based on statistical analyses depend on the data structure, which means they will change every time the measure is updated based on a new dataset and they are difficult to communicate to the public. Normative weights reflect people's judgements about the relative importance of indicators or their relative priority in terms of reducing poverty. Normative weights may be easy to communicate and do not need to be frequently revised. In between these two approaches lies the hybrid approach in which people's views on the relative importance of indicators are derived from statements by individuals (for instance, in surveys) or from people's self-reported happiness or well-being.

The standard practice across countries constructing multidimensional poverty indices has been to define the weights normatively. Most countries use equal weights across dimensions. This is the case of the highlighted cases above such as the UBN, AROPE, and CONEVAL. Moreover, the Alkire-Foster approach is flexible, it can be used with equal or differential weights. This is in accordance with the recommendation of the Conference of European Statisticians: "Normally, a deprivation or poverty index should count each item with an equal weight. Differential weights should only ever be used when this reduces measurement error (i.e. validity and/or reliability of the index are improved)." (Recommendation 28 (d), Poverty measurement: Guide to data disaggregation, Economic Commission for Europe, Conference of European Statisticians, ECE/CES/2020/9). Moreover, equal weights are easy to communicate. When used across dimensions, the justification for this is that all domains are perceived as equally important, and the use of equal weights ensures that no one dimension is privileged in the analysis.

Within dimensions, most countries have opted for also using equal weights across indicators. One way to do this is by applying what is known as the "nested weights" approach. One advantage of the nested weights approach is that it ensures that the importance of each dimension is not given by the number of available indicators, which may depend on data availability. Some domains are easier to monitor in household surveys than others. For instance, household surveys typically include several questions related to the characteristics of a dwelling (material of floors, material of ceilings, number of rooms, etc.). Taken together, they provide a full picture of the quality of a person's dwelling. On the other hand, there are other domains in which the number of indicators is more limited, such as in the case of access to health. Nested weights could allow the use of all the information available, without resulting in giving unbalanced (or unintended) larger importance to one domain over the other, only because of the characteristics of the data available. Indeed, several countries that use nested weights have a different number of indicators per dimension, resulting in unequal weighting across indicators.

Not all countries have used equal weights across dimensions. The measure of multidimensional poverty in Chile, for example, has five dimensions – four with equal weights and a fifth with a much lower weight. In the measures of Bhutan and Pakistan, some indicators within a dimension have different weights. Irrespective of the weights selected, it is important to examine the robustness of the poverty results to the choice of weights, by studying the extent to which the ordering of population subgroups (e.g. provinces) changes when considering alternative weighting schemes (including equal weighting).

>> (5) Poverty cut-off

Step five involves selecting a "poverty cut-off," defined as the minimum share of deprivations or the deprivation score that an individual or a household must have in order to be identified as multidimensionally poor. The decision on this parameter has special relevance because the poverty cut-off directly impacts the most popular poverty index – the headcount ratio. At one extreme of the range of possibilities for this parameter, the union approach argues that anyone who is deprived in at least one dimension should be considered poor. At the other extreme, the intersection approach requires that a given person be deprived in all dimensions to be considered poor (as in the case of Mexico). But often, the poverty cut-off is defined in between these two extremes, as a specific share of deprivations between 0 and 1. There is no universal rule on how to set the poverty threshold. Some countries have determined the poverty cut-off to reflect the findings of a participatory exercise (El Salvador), and others based on a legal document (Mexico). The robustness of the poverty results against the choice of poverty cut-off should be examined by, for instance, analyzing the sensitivity of the ordering of population subgroups based on poverty level to the consideration of different poverty cut-offs. The cut-off point should be easy to communicate and relatively intuitive. A fairly common option is to set the poverty cut-off using the union approach, such that a person is considered deprived when she is poor in at least one dimension or, if using weights, when the weighted deprivation score equals that of one dimension.

>> (6) Aggregation across individuals

The last step involves aggregating the information across individuals. The most common summary measure is the headcount ratio or incidence of poverty. The headcount ratio is the proportion of poor in the total population. Yet, as described in the examples in the previous section, alternative options have also been adopted. Following the family of measures proposed in the unidimensional setting designed by Foster, Greer and Thorbecke (1976) and extensions to multiple dimensions, some countries choose multidimensional poverty measures that capture the depth or intensity of poverty.

As described in Highlight 4, the preferred Alkire and Foster multidimensional poverty measure is one that combines the poverty incidence with the average number of deprivations among the multidimensionally poor. This measure is called by the authors the "adjusted headcount ratio" (M_0 or MPI). The first step is to compute the intensity of poverty, that is the average share of the (weighted or not) indicators in which the poor are deprived. M_0 is then calculated as the product of the incidence and the intensity of poverty. The adjusted headcount ratio can be disaggregated by population subgroups (e.g. geographic area, ethnicity), and it can be broken down by dimension or indicator.

>>> FURTHER READING:

- Chapter 7 of Multidimensional Poverty Measurement and Analysis.
- For a detailed analysis of indicators of non-monetary deprivations, see Santos (2019a) and Santos (2019b).
- For a fuller description on weighting systems see Decancq and Lugo (2013) and Greco, S., A. Ishizaka, M. Tasiou, and G. Torrisi (2019).

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Data

To construct a measure of multidimensional poverty that captures the overlapping deprivations, all indicators included in the measures should be available in the same dataset for all individuals or households. In theory, it is possible to combine data from different sources, as long as the variables can be mapped to the same individuals or households. This might be feasible when merging information collected at higher levels of identification (e.g. merging district-level variables with a household-level survey) or when the same household is interviewed in different surveys. In practice, most measures are built using a single data source, usually a multi-topic household survey.

Ideally, the definition of the desired dimensions and indicators should precede the selection of data sources. In this case, existing data sources need to be assessed to find the most suitable one to construct the measure of multidimensional poverty. Important features of the data source to consider in this assessment are:

(i) The extent to which the set of dimensions and indicators covered in the data source corresponds with the list of desired dimensions and indicators.

(ii) The levels of representativeness of the data source (e.g. national, urban and rural, regions, districts, ethnic groups), to ensure that it can provide information disaggregated at the levels that are most relevant for policy makers.

(iii) The age of the data source, to assess how recent the information is.

(iv) The frequency of data collection, to ensure that it is sufficient to monitor the country's progress.

(v) The comparability with previous rounds, in case it is possible to compute the measure for previous years.

BOX 6: MERGING DATA FROM DIFFERENT SOURCES

The US Measure of Multidimensional Deprivation uses individual and household-level data from the American Community Survey to inform 5 of its 6 indicators, and county-level data from the County Health Rankings and Roadmaps data set to inform the indicator "neighborhood quality."

The selection of data sources invariably involves compromises. Most often, the available data sources do not satisfy all the desired features. Sometimes, the choice of data source leads to the revision of dimensions and indicators, and reconsideration of the expectations in terms of desired disaggregation levels and frequency of the updates.

If no suitable data sources exist, there are two alternatives: modifying an existing data source or designing a new survey. Both these alternatives involve more time and resources than using an existing data source. Modifying an existing data source might consist of changing or adding questions to an official survey or modifying the sampling design to ensure the representativeness desired. Chile, Panama, and El Salvador have all introduced changes to their national household survey as part of their process of developing a national measure of multidimensional poverty. Designing a new survey is the most flexible option, as the new data source can be designed to meet all the desired requirements. This is the approach chosen by the Dominican Republic. Yet, this option requires investment in time and resources to design the new survey and collect data, as well as to ensure its institutionalization to guarantee its sustainability and frequency over time.

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Concluding remarks

Constructing a national multidimensional poverty measure requires policy dialogue, rigorous technical discussions, and involvement of specialized personnel in relevant government agencies. National ownership of the adopted measure is essential to its successful implementation and impact on development outcomes.

Developing a national multidimensional poverty measure involves several decisions that should be considered carefully to ensure that the proposed measure is technically robust. This roadmap is aimed at helping countries navigate this process, outlining the possible routes that can be taken at every step, and providing pointers for more in-depth study of existing methodologies. Yet, above all, having a transparent, participatory process is essential to ensuring the use and sustainability of the national multidimensional poverty measure a country chooses to adopt.

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Annex

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TABLE A.1 - Dimensions and Indicators

	WORLD BANK MPM	UNDP-OPHI MPI	CHILD POVERTY (GLOBAL ESTIMATES)	AROPE
MONETARY (AND LIVING STANDARD)	Consumption or income below $1.90			Disposable income (after social transfers) below 60% of the national median
				Household with very low work intensity
				Cannot pay unexpected expenses §
HOUSING		Housing	Overcrowding	Cannot pay rent or mortgage§
		Assets		TV set §
UTILITIES	Electricity	Electricity		Heating§
	Drinking water	Drinking water	Drinking water	
	Sanitation	Sanitation	Sanitation	
		Cooking fuel		
				Washing machine §
				Telephone §
EDUCATION	Adult school attainment	Adult school attainment (years of schooling)	Child school enrolment	
	Child school enrolment	Child school attendance	Primary completion (adolescents)	
HEALTH AND NUTRITION		Child mortality	Immunization, ARI treatment, reproductive health*	
		Nutrition (children and adults)	Stunting	Eat Meat or proteins regularly§
LEISURE				Car §
				Holidays §

** Immunization for children 12-35 months of age, ARI treatment for children 36-59 months of age, reproductive health for adolescents over 15 years of age*

§ Cannot afford at least four of these nine items

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TABLE A.2 - Indicators used in national, regional and global multidimensional poverty measures

		Indicator (broadly defined)	Armenia	Bhutan	Chile	Colombia	Costa Rica	Dom. Rep.	Ecuador	El Salvador	Honduras
Habitat Sphere	Housing	Housing materials (walls, roof, floor)		✔	✔	✔	✔	✔	✔	✔	✔
		Adequate housing (self-perceived or by type)	✔								
		Subjective housing conditions	✔								
		Overcrowding	✔		✔	✔	✔	✔	✔	✔	✔
		Housing tenure		✔						✔	
		Durable goods		✔	✔						✔
		Self-perceived insecurity			✔			✔		✔	
		Experience of crime in household								✔	
		Lack of green spaces nearby								✔	
		Noise and pollution									
		Natural disasters damage								✔	
	Basic Services	Access to safe water	✔	✔	✔	✔	✔	✔	✔	✔	✔
		Improved sanitation		✔	✔		✔	✔	✔	✔	✔
		Electricity		✔				✔			✔
		Cooking fuel		✔				✔			✔
		Fuel for other uses	✔								
		Cannot keep house warm									
		Self-reported quality of basic services	✔								
		Garbage collection/disposal	✔		✔		✔		✔		
		Nearby sources of contamination			✔			✔			
		Transportation/accessibility	✔	✔	✔						
		Access to internet					✔	✔			
Affiliation Sphere	Education	Child school attendance	✔	✔	✔	✔	✔	✔	✔	✔	✔
		Schooling	✔	✔	✔	✔	✔	✔	✔	✔	
		Literacy				✔					✔
		Early childhood care				✔	✔	✔		✔	
		Educational gap			✔	✔	✔	✔		✔	
		Child grade repetition									
		Quality of education	✔								
		Financial constraints to higher education							✔		
	Employment	Unemployment/long-term unemployment	✔		✔	✔	✔		✔	✔	✔
		Underemployment								✔	✔
		Independent informal labour					✔				
		Informal labour (not contributing to pension system)	✔		✔	✔	✔	✔	✔	✔	✔
		participation)	✔				✔				
		Low work intensity						✔			
		Child labour				✔		✔	✔	✔	✔
		Noncompliance with other employment rights					✔				
	Social Prot.	Retirement age people receiving contributory pension			✔						
		Disabled people not receiving transfers					✔				
		Unemployed not receiving insurance							✔		
	Health	Access to health care (insurance)	✔		✔	✔	✔	✔		✔	
		Effective access to health care	✔		✔	✔		✔		✔	
		Effective checks during pregnancy/delivery									
		Distance to the closest primary health centre	✔								
		Self-reported quality of health service	✔								
		Malnutrition			✔						
		Food insecurity		✔				✔		✔	
		Child mortality		✔				✔			
		Child immunization									
		Early pregnancy and female genital mutilation									
		Disability/ bad health	✔								
		Limitations in daily activities									
		Self-reported overall health status									
	Income	One or more income indicators	✔						✔		
	Other	Migrants									
		Social participation			✔			✔			
		Perception of discrimination			✔			✔			
		National identity card/document						✔			

Source: Santos (2019a).

Malaysia	Mexico	Moldova	Mozambique	Nepal	Pakistan	Panama	South Africa	Vietnam	Global MPI	MPI-LA	Arab MPI	MPI-EU	Total
	✔		✔	✔	✔	✔			✔	✔	✔	✔	17
✔							✔						3
													1
✔	✔	✔	✔		✔	✔		✔		✔	✔		17
								✔		✔			4
✔			✔	✔	✔		✔	✔	✔	✔	✔	✔	13
													3
												✔	2
													1
												✔	1
						✔							2
✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔		21
✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔		19
	✔		✔	✔	✔	✔	✔	✔	✔	✔	✔		13
	✔			✔	✔		✔		✔	✔	✔		10
		✔					✔						3
		✔											1
													1
✔						✔							6
													2
			✔			✔							5
						✔							3
✔	✔		✔	✔	✔	✔	✔	✔	✔	✔	✔		20
✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	21
													2
													4
										✔			6
						✔							1
					✔								2
													1
		✔				✔	✔			✔		✔	12
		✔											3
													1
	✔	✔						✔		✔			12
		✔											3
													1
													5
						✔							2
	✔							✔		✔			4
													1
													1
	✔	✔						✔		✔			10
					✔	✔		✔				✔	9
					✔	✔							2
			✔										2
													1
			✔	✔					✔		✔		5
	✔												4
				✔			✔		✔		✔		6
					✔								1
											✔		1
		✔										✔	3
												✔	1
		✔										✔	2
	✔	✔								✔		✔	6
		✔											1
													2
													2
													1

> > >

TABLE A.3 - Dimensions and indicators used in studies of multidimensional child poverty

		Nutrition					Health					Housing and living conditions							Exploitation	
	Studies in multidimensional poverty	Access and quality of food	Breastmilk	Growth (height by age)	Underweight (weight by age)	Wasting (weight by height)	Immunization	Qualified assistance in childbirth	Infant mortality	Access to health services	Untreated diarrheal diseases	Materials, quality of home and surroundings	Overcrowding	Drinkable water	Distance to drinkable water	Sanitation	Cooking fuel	Electricity	Excess housework	Child labor
Latin America and the Caribbean	Argentina (2016)	x	x							x	x	x	x	x	x	x		x		x
	Argentina (2015)	x					x			x			x			x			x	x
	Argentina (2013)	x					x			x		x	x			x				
	Colombia (2014)					x	x				x	x		x		x	x			
	Colombia (2012)	x		x			x			x		x	x	x		x				
	El Salvador (2014)			x	x							x	x	x		x		x		x
	Guatemala (2016)		x				x	x				x	x	x	x	x		x		
	Honduras (2016)			x	x		x	x	x	x	x	x	x	x		x		x		x
	Paraguay (2015)			x	x							x	x	x		x				
	Uruguay (2016)											x	x	x		x				
	Uruguay (2008)			x									x							
Other Countries	Afganistan (2010)	x											x	x					x	x
	Bangladesh (2013)			x	x	x	x				x	x		x		x				
	Butan (2016)	x			x				x			x		x	x	x	x	x		x
	China (2014)	x		x	x		x			x		x	x	x		x	x	x		
	Congo Brazzaville (2012)	x								x		x	x	x	x	x				x
	Darfur Occidental (2013)	x								x			x	x						
	Egypt (2013)		x	x	x		x				x	x	x	x	x					
	India (2011)											x	x	x			x	x		
	Mali (2014)	x	x	x	x	x	x	x				x	x	x	x	x				x
	Nigeria (2012)			x	x		x					x		x	x					
	Papua (Indonesia) (2013)						x				x	x	x	x	x					
	Tanzania (2012)					x	x				x	x	x	x	x	x				
	Sub-Saharan Africa (2014)[b]	x				x	x	x				x	x	x	x	x				
International	ECLAC-UNICEF (2010)[c]			x	x							x	x	x	x	x		x		
	UNICEF (2004)[d]			x	x		x				x	x	x	x	x	x				
	UNICEF (CC-MODA) (2012)[e]	x	x		x		x	x				x	x	x	x	x				
	European Union (2010)[f]									x		x	x							

a Undershood as the voluntary (or forced) incorporation of the child/adolescent into community and neighborhood activities.
b The study includes information from 30 countries in Sub-Saharan Africa.
c This study initially considered information from 17 countries in the region. Later, eight Caribbean countries were added to the publication of ECLAC (2013).
d The study includes information from 57 countries worldwide.
e The study works with information from 99 countries.
f The study considers information from nine countries.
g Includes early childhood development (early childhood education and preschool).
h Includes orphan and residence with biological parents.
i Includes marriage and early fertility.

Education					Money and possession of property						Care and capabilities							Social inclusion[a]		
School attendance[g]	Educational achievement	Behind in school	Literacy	Household members' education	Income	Expenses	Land ownership and plot size	Assets	Financial difficulties	Access to information devices	Violence and child abuse	Civil registration / birth certificate	Child care[h]	Loving care for the child	Autonomy	Mobility	Leisure	Participation in ceremonies	Marriage commitment	Neighborhood safety
x	x	x								x							x			
x		x								x	x									
x		x								x										
x				x	x			x			x	x								
x		x			x					x	x		x				x			x
x		x								x										
x		x											x							
x		x								x	x	x	x							
x	x									x										
x		x						x		x										
		x			x															
x								x			x		x		x	x	x	x	x	
										x										
x	x						x	x			x		x		x					
x								x		x							x			
x		x				x		x												
x					x		x	x			x		x	x				x		
x	x									x										
x			x				x	x												
x		x	x							x		x	x							
x										x										
x										x										
x	x									x	x									
x	x									x										
x										x										
x	x									x	x									
x									x											x

Source: Economic Commission for Latin America and the Caribbean, on the basis of national and international studies: Afghanistan (Biggeri, Trani and Mauro, 2010), Sub-Saharan Africa (Milliano and Plavgo, 2014), Argentina (2016) (UNICEF, 2016a), Argentina (2015) (Observatorio de la Deuda Social Argentina, 2015), Argentina (2013) (Tuñón and González, 2013), Bangladesh (Roche, 2013), Bhutan (Alkire et al., 2016), ECLAC / UNICEF (2010), China (Qi and Wu, 2014), Colombia (2014) (Torres, 2014), Colombia (2012) (Universidad de Los Andes / UNICEF, 2012), Congo (Notten et al., 2012), Western Darfur (Trían and Cannings, 2013), Egypt (UNICEF / Informal Settlements Development Facility, Egyipt, 2013), El Salvador (Presidential Technical and Planning Secretariat - STPP and UNICEF, 2014), Guatemala (ICEFI / UNICEF, 2016), Honduras (UNICEF , 2016b), India (Mohanty, 2011), Mali (Milliano and Handa, 2014), Nigeria (Adetola and Olufemi, 2012), Papua (Indonesia) (Landiyanto, 2013), Paraguay (Bruno and Osorio, 201 5), Tanzania (Minujin and Delamonica, 2012), UNICEF (2004), UNICEF-CC MODA (Neubourg et al., 2012), European Union (Notten and Roelen, 2010), Uruguay (2016) (Colacce and Tenenbaum, 2016) and Uruguay (2008) (Amarante, Arim and Vigorito, 2008).


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