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STATISTICS

Non-monetary indicators to monitor SDG targets 1.2 and 1.4

Standards, availability, comparability and quality

Maria Emma Santos

UNITED NATIONS

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This document has been prepared by María Emma Santos, Consultant, under the supervision of Pablo Villatoro, Senior Statistics Assistant, and Xavier Mancero, Chief of the Social Statistics Unit of the Statistics Division of the Economic Commission for Latin America and the Caribbean (ECLAC). For the preparation of the document, inputs and comments were kindly provided by the Economic and Social Commission for Western Asia (ESCWA), the Economic Commission for Europe (ECE), the Economic and Social Commission for Asia and the Pacific (ESCAP) and the United Nations Human Settlements Programme (UN-Habitat), as implementing entities of the component "Poverty, including multi-dimensional poverty, and inequality statistics and indicators", in the framework of the Programme on Statistics and Data of the tenth tranche of the United Nations Development Account.

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Abstract

This report offers a review of 14 non-monetary indicators of poverty to monitor progress towards the first Sustainable Development Goal (SDG) "End poverty in all its forms everywhere". The reviewed indicators are housing materials, overcrowding, housing tenure, durable goods, access to safe water and improved sanitation, access to clean sources of energy, garbage collection and nearby sources of contamination, (public) transportation, child attendance to school and adult schooling, employment, social security and access to health care.

For each of these indicators the study offers (a) short motivation about the capacity to "capture the essence" of some dimension of poverty, (b) a review of the indicator's most prevalent specification/s and an indication of the minimum international standard – if there is one – for a satisfactory achievement, (c) a general assessment of current data availability, considering the most prominent standardised household surveys across the world, and (d) discussion and recommendations on each indicator's specification and standard to be used homogeneously across countries. Two overarching messages from this report are: (1) that it is important to continue building international consensus regarding the desirable minimum thresholds and (2) that there is still room and need for significant improvements in data collection.

Introduction

This report offers a thorough review of a number of non-monetary poverty indicators to monitor progress towards the first Sustainable Development Goal (SDG) "End poverty in all its forms everywhere", specifically those indicators related to Targets 1.2 and 1.4. Target 1.2 reads: "By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions". It has two indicators. Indicator 1.2.1 is the "Proportion of population below the national poverty line, by sex and age", whereas Indicator 1.2.2 is the "Proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions". Target 1.4 reads: "By 2030, ensure that all men and women, in particular the poor and vulnerable, have equal rights to economic resources as well as to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance" (UN, 2017a). It also has two indicators. Indicator 1.4.1 is the "Proportion of population living in households with access to basic services"; Indicator 1.4.2 is the "Proportion of total adult population with secure tenure rights to land, with legally recognized documentation and who perceive their rights to land as secure, by sex and by type of tenure". This study focuses on Indicators 1.2.1, 1.4.1 and 1.4.2. Indicators of monetary poverty (Indicator 1.2.1) are not covered here.[1]

The reviewed indicators are likely to be included in a national or regional multidimensional poverty index (MPI), understood here as a poverty index following the Alkire and Foster (2011) methodology. The study builds upon the valuable contribution of Villatoro (2017a) as well as on the various contributions of participants in the Seminar on Non-monetary Poverty Indicators for Latin America, held by CEPAL in May 2017 (Villatoro, 2017c).

In their work on social indicators for Europe, Atkinson et al. (2002) defined a number of desirable characteristics that each single indicator and the portfolio of indicators should satisfy. Each single indicator should (1) **identify the essence** of the problem and have a clear and accepted normative interpretation, (2) be **robust** and statistically validated, (3) be **responsive** to effective policy interventions but not subject to manipulation, (4) be measurable in a sufficiently **comparable** way across countries, (5) be **timely** and **susceptible to revision**, and (6) **not impose too large a burden** on countries. The portfolio of indicators

[1] Indicators of monetary global poverty are extensively discussed in World Bank (2017), a report that also recognizes the relevance of non-monetary indicators of poverty.

should (1) be **balanced** across dimensions, (2) have indicators that are mutually **consistent** and have proportionate weights, and (3) be as **transparent** and **accessible** as possible to citizens.

The list of indicators to be considered was difficult to delimit. Indicators of Targets 1.2.2 and 1.4.1 remain quite broad, and there are many overlaps with indicators of other targets. The different SDG indicators are at different stages of development (UN, 2017b, p. 3), which have been grouped into three tiers. Tier 1 indicators have an internationally established methodology, standards are available and data are regularly produced by countries for at least 50% of countries in every region where the indicator is relevant. Tier 2 indicators have an internationally established methodology and standards are available, but countries do not regularly produce data. Finally Tier 3 indicators have no internationally established methodology or standards yet, but these are being developed. The indicator of Target 1.2.2 is considered a Tier II indicator and the indicator of Target 1.4.1 is considered Tier III. However, both encompass and overlap with indicators from other targets, some of which are Tier I (such as the water, sanitation and hygiene [WASH] indicators).

As a starting point, 22 MPIs were revised. These include the global MPI, three regional MPIs – one for Latin America (MPI-LA), one for Europe and another for Arab countries (Arab MPI) – and 18 national MPIs. Among the national MPIs fourteen have been introduced as official national measures of poverty. Three other national MPIs are not official measures but have been designed and computed as an exploratory exercise by some government agency. Only one national MPI – Vietnam's – has been proposed by independent researchers. Nine of the official national MPIs are from Latin American countries, which belong to the ECLAC regional commission: Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Honduras, Mexico and Panama. Six other national MPIs are from countries belonging to the ESCAP region: Armenia, Bhutan, Malaysia, Pakistan, Nepal and Vietnam. One other national MPI is from an UNECE country: Moldova; Armenia also belongs to UNECE (in addition to belonging to ESCAP). Two national MPIs belong to UNECA countries: South Africa and Mozambique. Finally, it is worth noting that the Arab MPI has been jointly developed by ESCWA, the League of Arab States Ministerial Council, and the Oxford Poverty and Human Development Initiative (OPHI), and enjoys broad support from the involved countries.[2] The Arab MPI has two sets of deprivation cutoffs: one set identifies *acute* deprivation in each indicator and the other more demanding set of cutoffs identifies deprivation in each indicator and leads to the multidimensional poverty index.

The reviewed MPIs offer relevant guidance on what country governments understand as constituents of multidimensional poverty table 1 (inspired by Mancero, 2017) presents the range of indicators used in the different considered MPIs, alongside other details such as the data source used, whether it is an official poverty measure, the institution responsible for the measure and the year in which it was introduced. The classification of indicators into different dimensions uses the classification followed in this report, described below. However, the actual classification of indicators across the different MPIs varies. The last column of the table 1 indicates the frequency with which each indicator has been included. This information is also presented in Figure 1. It is worth noting that the indicators are defined in a broad way (there are many different specifications used across countries). Based on this information and in agreement with CEPAL, the indicators listed in table 2 were selected, covering the dimensions recommended by the UNECE (2017) Guide on Poverty Measurement (recommendation 23).

The indicators have been grouped into two broad spheres: (1) habitat and the built environment and (2) affiliation. The habitat and built environment sphere refers to the broad set of human-made elements

[2] References for each reviewed MPI are the following: Armenia (National Statistical Service of the Republic of Armenia, 2016), Bhutan (National Bureau of Statistics, 2014), Chile (Ministerio de Desarrollo Social de Chile, 2013 and Berner, 2016), Colombia (Angulo et al., 2013), Costa Rica (INEC, 2015), Dominican Republic (Sistema Único de Beneficiarios [SIUBEN], 2017), Ecuador (Castillo Añazco and Perez, 2015), El Salvador (Government of El Salvador, 2015), Honduras (SCGG-INE, 2016), Malaysia (Economic Planning Unit, 2013), Mexico (CONEVAL, 2010), Moldova (National Bureau of Statistics Moldova, 2016), Mozambique (Ministry of Economics and Finance, 2016), Nepal (National Planning Commission Nepal, 2018), Pakistan (National Planning Commission Pakistan, 2016), Panama (Government of Panama, 2017), South Africa (Statistics South Africa, 2014), Vietnam (Le, A.V., Nguyen, C. V., Phung. T. C., 2014), global MPI (Alkire and Santos, 2010, 2014; UNDP, 2010), MPI-LA (Santos et al. 2015; Santos and Villatoro, 2016), Arab MPI (League of Arab States Ministerial Council for Social Affairs, 2017).

that constitute the physical space where people perform their daily activities, which includes UN-Habitat broad concept of adequate shelter. The built environment affects the way people live and develop; it influences their physical and mental health. Within this sphere, indicators are grouped into: (1) housing, comprising indicators of housing materials, overcrowding, housing tenure and durable goods, and (2) basic services (WASH), energy, solid waste collection and transportation. Inspired by Nussbaum (2003), the affiliation sphere refers to having a *formal* link with basic social institutions that contribute to the development of the person.[3] The three basic institutions considered are education, work and social protection, and health.

For each of these indicators the study offers a short motivation, i.e. its capacity to "capture the essence" of some dimension of poverty (Principle 1 of Atkinson et al., 2002). Then, there is a review of the indicator's most prevalent specification/s and an indication of the international standard — if there is one — for the minimum threshold level that needs to be reached in order to have a satisfactory achievement. Each indicator's section also offers a general assessment of current data availability, considering the most prominent standardised household surveys across the world, namely: LSMS, DHS, MICS and EU-SILC for EU countries, as well as the proposed "Light and Powerful" survey modules by OPHI and the Multidimensional Poverty Peer Network (MPPN).[4] It also provides more specific analysis of the indicator's availability across countries, based on the companion dataset to this study. These two last discussions are aimed at analysing the cross-country comparability and robustness of the indicator (Principles 4 and 2 of Atkinson et al., 2002). Finally it presents some discussion and recommendations on each indicator's specification and standard to be used homogeneously across countries. The recommendations aim at improving availability, comparability and quality but, mindful of Principle 6 of Atkinson et al. (2000), at a reasonable cost or burden in terms of data collection. For each indicator there are a few key recommendations, and some other suggestions for further improvements over time (attending to Principle 5).

This study is accompanied by a dataset named "Data Availability on Poverty Indicators for "SDGs 1.2.1, 1.4.1, 1.4.2" (referred to as DAPI hereafter). The dataset contains information on the availability from household survey data of indicators covered in this study. DAPI comprises 84 countries over the period 2000–2017 and is built upon information provided by some of the UN regional commissions and Villatoro (2017a). It excludes Africa. Of the countries covered, the dataset is quite comprehensive but not fully exhaustive.[5] Considered surveys include DHS, MICS, Labour Force Surveys, LSMS, Poverty Indicators Survey, Family Planning Surveys, Income and Expenditure Surveys and EU-SILC. table 3 presents a brief description of the coverage of this dataset, and table 4 details the countries where surveys were assessed.

[3] A similar broad category has been used by Paz (2014) and Santos et al. (2015). Emotional attachment or belonging to institutions are not considered here.

[4] The DHS (a USAID Programme) have been carried out in 91 countries so far, of which 7 belong to the ECE region, 19 to ESCAP, 7 to ESCWA and 15 to LAC (the others are African countries); MICS (a UNICEF Programme) have been carried out in 110 countries so far, of which 14 are ECE countries, 22 belong to ESCAP, 11 to ESCWA and 19 to LAC (again, the other countries are African). Thus, these two surveys have significant coverage across the countries considered in this study. Building on DHS, MICS and other well-known surveys, OPHI and the MPPN have proposed (Draft) Post-2015 'Light and Powerful' Survey Modules to monitor the SDGs. They have not yet been implemented in any country. The EU-SILC is carried out in 33 of the 56 ECE countries.

[5] It is worth noting that datasets for India and China have not been analyzed.

Table 1
Indicators used in national, regional and global MPIs

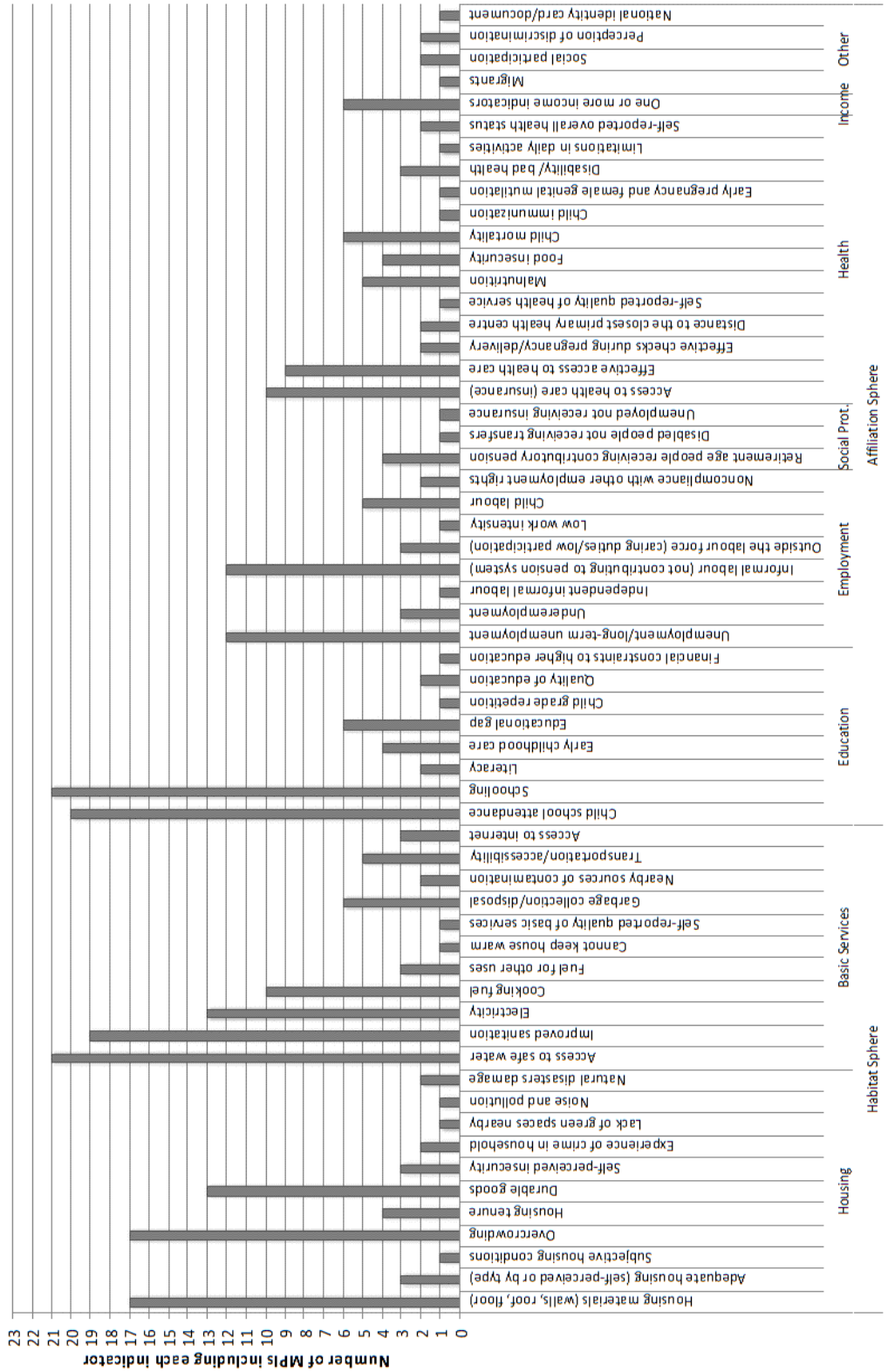
		Indicator (broadly defined)	Armenia	Bhutan	Chile	Colombia	Costa Rica	Dom. Rep.	Ecuador	El Salvador	Honduras	Malaysia	Mexico	Moldova	Mozambique	Nepal	Pakistan	Panama	South Africa	Vietnam	Global MPI	MPI-LA	Arab MPI	MPI-EU	Total
Habitat Sphere	Housing	Housing materials (walls, roof, floor)		✔	✔	✔	✔	✔	✔	✔	✔		✔		✔	✔	✔	✔			✔	✔	✔	✔	17
		Adequate housing (self-perceived or by type)	✔									✔							✔						3
		Subjective housing conditions	✔																						1
		Overcrowding	✔		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔			✔	✔	✔		✔	✔		17
		Housing tenure		✔						✔										✔		✔			4
		Durable goods		✔	✔						✔	✔			✔	✔	✔		✔	✔	✔	✔	✔	✔	13
		Self-perceived insecurity			✔			✔		✔															3
		Experience of crime in household								✔														✔	2
		Lack of green spaces nearby								✔															1
		Noise and pollution																						✔	1
		Natural disasters damage								✔								✔							2
	Basic Services	Access to safe water	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔		21
		Improved sanitation		✔	✔		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔		19
		Electricity		✔				✔			✔		✔		✔	✔	✔	✔	✔	✔	✔	✔	✔		13
		Cooking fuel		✔				✔			✔		✔			✔	✔		✔		✔	✔	✔		10
		Fuel for other uses	✔											✔					✔						3
		Cannot keep house warm												✔											1
		Self-reported quality of basic services	✔																						1
		Garbage collection/disposal	✔		✔		✔		✔			✔						✔							6
		Nearby sources of contamination			✔			✔																	2
		Transportation/accessibility	✔	✔	✔										✔			✔							5
		Access to internet					✔	✔										✔							3
Affiliation Sphere	Education	Child school attendance	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔	✔	✔		20
		Schooling	✔	✔	✔	✔	✔	✔	✔	✔		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	21
		Literacy				✔					✔														2
		Early childhood care				✔	✔	✔		✔															4
		Educational gap			✔	✔	✔	✔		✔												✔			6
		Child grade repetition																✔							1
		Quality of education	✔														✔								2
		Financial constraints to higher education							✔																1
	Employment	Unemployment/long-term unemployment	✔		✔	✔	✔		✔	✔	✔			✔				✔	✔			✔		✔	12
		Underemployment								✔	✔			✔											3
		Independent informal labour					✔																		1
		Informal labour (not contributing to pension system)	✔		✔	✔	✔	✔	✔	✔	✔		✔	✔						✔		✔			12
		participation)	✔				✔							✔											3
		Low work intensity						✔																	1
		Child labour				✔		✔	✔	✔	✔														5
		Noncompliance with other employment rights					✔											✔							2
	Social Prot.	Retirement age people receiving contributory pension			✔								✔							✔		✔			4
		Disabled people not receiving transfers					✔																		1
		Unemployed not receiving insurance							✔																1
	Health	Access to health care (insurance)	✔		✔	✔	✔	✔		✔			✔	✔						✔		✔			10
		Effective access to health care	✔		✔	✔		✔		✔							✔	✔		✔				✔	9
		Effective checks during pregnancy/delivery															✔	✔							2
		Distance to the closest primary health centre	✔												✔										2
		Self-reported quality of health service	✔																						1
		Malnutrition			✔										✔	✔					✔		✔		5
		Food insecurity		✔				✔		✔			✔												4
		Child mortality		✔				✔								✔			✔		✔		✔		6
		Child immunization															✔								1
		Early pregnancy and female genital mutilation																					✔		1
		Disability/ bad health	✔											✔										✔	3
		Limitations in daily activities																						✔	1
		Self-reported overall health status												✔										✔	2
	Income	One or more income indicators	✔						✔				✔	✔								✔		✔	6
	Other	Migrants												✔											1
		Social participation			✔			✔																	2
		Perception of discrimination			✔			✔																	2
		National identity card/document						✔																	1

Table 1 (concluded)

	Armenia	Bhutan	Chile	Colombia	Costa Rica	Dom. Rep.	Ecuador	El Salvador	Honduras	Malaysia	Mexico	Moldova	Mozambique	Nepal	Pakistan	Panama	South Africa	Vietnam	Global MPI	MPI-LA	Arab MPI	MPI-EU	Total
Corresponding UN Regional Comission	**ESCAP & UNECE**	**ESCAP**	**ECLAC**	**ECLAC**	**ECLAC**	**ECLAC**	**ECLAC**	**ECLAC**	**ECLAC**	**ESCAP**	**ECLAC**	**UNECE**	**UNECA**	**ESCAP**	**ESCAP**	**ECLAC**	**UNECA**	**ESCAP**	**NA**	**ECLAC**	**ESCWA**	**UNECE**	
Data Source used for Computations	Integrated Living Conditions Survey	Bhutan Living Standards Survey	CASEN	Encuesta de Calidad de Vida	Encuesta Nacional de Hogares	Encuesta PM-RD	Encuesta Nacional de Empleo, Desempleo y Subempleo (ENEMDU)	Encuesta de Hogares de Propósitos Múltiples	Encuesta de Hogares de Propósitos Múltiples	Household Income/Basic Amenities Survey (HIS/BA)	Socioeconomic Conditions Module of the National Survey of Household Income and Expenditures	Houshold Budget Survey	Inquérito aos Agregados Familiares sobre Orçamento Familiar	MICS	Pakistan Social and Living Standards Measurement Survey	Encuesta de Propositos Multiples	South Africa Census	Household Living Standard Survey	DHS, MICS, and some special country surveys	Regular official household surveys	DHS, MICS and Arab Family Health Project (PAPFAM)	EU-SILC	
Official Measure	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	No	No	NA	NA	NA	NA	
Responsible Entity	National Statistical Service of the Republic of Armenia and the World Bank	National Bureau of Statistics Royal Government of Bhutan.	Ministerio de Desarrollo Social	Dpto. Nacional de Planeación Govt. Colombia	Instituto Nacional de Estadistica y Censo (INEC)	Vice presidencia de la Rep. Dom. SIUBEN.	Instituto Nacional de Estadistica y Censos	Secretaria Tecnica de la Presidencia de la Republica, Govt. El Salvador	Instituto Nacional de Estadisticas		CONEVAL		Ministerio de Economia e Financas Direccao de Estudos Economicos e Financeiros	National Planning Commission Govt. Nepal	Planning Commission of Pakistan, Pakistan Bureau of Statistics, OPHI, UNDP Pakistan	Ministerio de Economía y Finanzas, Ministerio de Desarrollo Social, Instituto de Estadística y Censo							
Non-official measure but designed in a government agency										Economic Planning Unit Prime Minister's Department		National Bureau of Statistics Moldova					Statistics South Africa					
Non-official measure and designed by a non-government organisation																		Mekong Development Research Institute, Hanoi, Vietnam.	UNDP & OPHI	Santos, Villatoro, Mancero, Gerstenfeld	League of Arab States Ministerial Council for Social Affairs, ESCWA, UNICEF and OPHI	Alkire and Apablaza	
Year introduced	2017	2014	2013	2011	2015	2017	2015	2015	2013	2013	2010	2016	2016	2018	2016	2017	2014	2014	2010	2015	2017	2016	

Source: Own elaboration.

Figure 1
Frequency of inclusion of each indicator in national, regional or global MPIs



Source: Own elaboration.

Table 2
Selected non-monetary indicators of poverty

Sphere	Dimension	Indicator	Relation to requested SDG Indicators	Relation to other SDG Indicators	Broader relation to other SDGs (broad)
Habitat and the built environment	**Housing**	Housing materials	Ind. 1.2.2	Ind. 11.1.1	SDG 3
		Overcrowding			
		Housing tenure	Ind. 1.4.2 and 1.2.2		
		Durable goods	Ind. 1.2.2		
	Basic services	Water	Ind. 1.4.1 and 1.2.2	Ind. 6.1.1	SDG 3 and 6
		Sanitation		Ind. 6.2.1	
		Energy		Ind. 7.1.1 and 7.1.2	SDG 3 and 7
		Garbage collection and nearby sources of contamination	Ind. 1.4.1 and 1.2.2	Ind. 11.6.1 and 12.4.2	SDG 3, 11 and 12
		(Public) Transportation		Ind. 11.2.1	SDG 9 and 11
Affiliation	**Education**	Child school attendance	Ind. 1.4.1 and 1.2.2	Ind. 4.1.1, 4.2.1, 4.2.2 and 4.6.1, and thematic Ind. 4.1.4, 4.1.5, and 4.4.3	
		Adult schooling			SDG 8 (esp. 8.5 and 8.6)
	Employment and social protection	Employment	Ind. 1.2.2	SDG 8 (productive employment and decent work)	SDG 8 (esp. 8.5–8.8), SDG 2 (esp. 2.3), and SDG 5
		Social security	Ind. 1.4.1 and 1.2.2	Ind. 1.3.1	SDG 2 (esp. 2.2), 3 (esp. 3.8), 5, 8, and 10 (esp. 10.4)
	Health	Access to health care	Ind. 1.4.1 and 1.2.2	Ind. 3.8.1	SDG 2 (esp. 2.2), 3 (esp. 3.1, 3.2, 3.7, and 3.8), and 5 (esp. 5.6)

Source: Own elaboration.
Note: Indicators in grey have received a less in-depth treatment.

Table 3
Number of countries and surveys covered in DAPI

Region	UN Regional Commission	Total number of countries in each region	Number of countries with one or more available household survey 2000–2017	Total number of surveys considered (2000–2017)
East Asia & Pacific	ESCAP	37	5	78
Europe & Central Asia	UNECE (some also ESCAP)	58	32	404
Latin America & Caribbean	ECLAC	42	26	245
Middle East and North Africa	ESCWA	22	19	186
South Asia	ESCAP	8	2	27
Total		167	84	940

Source: Own elaboration. Dataset “Data availability on indicators for SDGs 1.2.1, 1.4.1, 1.4.2”.

Table 4
List of countries with at least one household survey considered in DAPI

Region	Country	Region	Country
East Asia & Pacific	Mongolia	Latin America & Caribbean	Chile
East Asia & Pacific	Philippines	Latin America & Caribbean	Colombia
East Asia & Pacific	Solomon Islands	Latin America & Caribbean	Costa Rica
East Asia & Pacific	Thailand	Latin America & Caribbean	Cuba
East Asia & Pacific	Tonga	Latin America & Caribbean	Dominican Republic
Europe & Central Asia	Austria	Latin America & Caribbean	Ecuador
Europe & Central Asia	Belgium	Latin America & Caribbean	El Salvador
Europe & Central Asia	Bulgaria	Latin America & Caribbean	Guatemala
Europe & Central Asia	Croatia	Latin America & Caribbean	Guyana
Europe & Central Asia	Cyprus	Latin America & Caribbean	Haiti
Europe & Central Asia	Czech Republic	Latin America & Caribbean	Honduras
Europe & Central Asia	Denmark	Latin America & Caribbean	Jamaica
Europe & Central Asia	Estonia	Latin America & Caribbean	Mexico
Europe & Central Asia	Finland	Latin America & Caribbean	Nicaragua
Europe & Central Asia	France	Latin America & Caribbean	Panama
Europe & Central Asia	Georgia	Latin America & Caribbean	Paraguay
Europe & Central Asia	Germany	Latin America & Caribbean	Peru
Europe & Central Asia	Greece	Latin America & Caribbean	Suriname
Europe & Central Asia	Hungary	Latin America & Caribbean	Trinidad and Tobago
Europe & Central Asia	Iceland	Latin America & Caribbean	Uruguay
Europe & Central Asia	Ireland	Latin America & Caribbean	Venezuela (Bol. Rep.of)
Europe & Central Asia	Italy	Middle East & North Africa	Algeria
Europe & Central Asia	Latvia	Middle East & North Africa	Djibouti
Europe & Central Asia	Lithuania	Middle East & North Africa	Egypt
Europe & Central Asia	Luxembourg	Middle East & North Africa	Iraq
Europe & Central Asia	Netherlands	Middle East & North Africa	Jordan
Europe & Central Asia	Norway	Middle East & North Africa	Kuwait
Europe & Central Asia	Poland	Middle East & North Africa	Lebanon
Europe & Central Asia	Portugal	Middle East & North Africa	Libya
Europe & Central Asia	Romania	Middle East & North Africa	Malta
Europe & Central Asia	Serbia	Middle East & North Africa	Morocco
Europe & Central Asia	Slovenia	Middle East & North Africa	Oman
Europe & Central Asia	Spain	Middle East & North Africa	Palestine
Europe & Central Asia	Sweden	Middle East & North Africa	Qatar
Europe & Central Asia	Switzerland	Middle East & North Africa	Saudi Arabia
Europe & Central Asia	Tajikistan	Middle East & North Africa	Syrian Arab Republic
Europe & Central Asia	United Kingdom	Middle East & North Africa	Tunisia
Latin America & Caribbean	Argentina	Middle East & North Africa	United Arab Emirates
Latin America & Caribbean	Belize	Middle East & North Africa	Yemen
Latin America & Caribbean	Bolivia	South Asia	Bangladesh
Latin America & Caribbean	Brazil	South Asia	Nepal

Source: Own elaboration.

I. The habitat and built environment sphere

The habitat and built environment sphere encompasses a broad set of indicators that are condensed in the UN-Habitat concept of adequate shelter:

> "Adequate shelter means more than a roof over one's head. It also means adequate privacy; adequate space; physical accessibility; adequate security; security of tenure; structural stability and durability; adequate lighting, heating and ventilation; adequate basic infrastructure, such as water-supply, sanitation and waste-management facilities; suitable environmental quality and health-related factors; and adequate and accessible location with regard to work and basic facilities: all of which should be available at an affordable cost".[6]

Access to such adequate habitat has been recognised as a human right,[7] and it has been operationalized into seven minimum requirements in the International Covenant on Economic, Social and Cultural Rights (CESCR, 1991): (1) legal security of tenure; (2) availability of services, materials, facilities, and infrastructure; (3) affordability; (4) habitability; (5) accessibility; (6) location; and (7) cultural adequacy.

Virtually all assessments of non-monetary poverty have included at least some indicator of habitat. However, the number and type of habitat indicators usually included have been quite limited and quite different between developing countries and developed ones. This report covers the main aspects of secure tenure, access to services, habitability, location and cultural adequacy.[8] Affordability and accessibility, although also fundamental, are not covered.[9] The included indicators are grouped into two dimensions: housing and basic services.

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6 UN-Habitat, 1996, ch. IV, No. 60.

7 Universal Declaration of Human Rights (UN, 1948, art. 25) and the International Covenant on Economic, Social and Cultural Rights (CESCR) (UN, 1966; Art. 11).

8 Within each requirement the list of covered indicators could obviously be more ambitious or exhaustive.

9 The accessibility requirement refers to disadvantaged groups such as the elderly, children, physically disabled people, the terminally ill, HIV-positive individuals, persons with persistent medical problems, the mentally ill and victims of natural disasters – who should be ensured some degree of priority for housing (CESCR, 1991). The term 'accessibility' will be used in the discussion of the transportation dimension, but accessibility in that context actually corresponds to the 'location' aspect of the definition.

In *developing countries*, considered indicators are typically related to availability of services and habitability:

- housing materials (most commonly floor, and sometimes walls and roof),
- access to sufficient space (overcrowding),
- access to clean water and improved sanitation, and,
- occasionally, energy sources.

These indicators were included in the Unsatisfied Basic Needs (UBN) official measures in Latin America (INDEC, 1984; Feres and Mancero, 2001),[10] in UBN measures of Arab countries (for Lebanon: UNDP and MoSA, 1998, 2007; for Iraq: UNDP and MPDC 2006) and in various proposed measures of child poverty (Gordon et al., 2003; Minujin et al., 2006; UNICEF/CEPAL, 2010; Alkire and Roche, 2012; Paz-UNICEF, 2016; Espindola, 2017). These indicators are also present in the recently developed official multidimensional poverty measures of 14 countries, in addition to national non-official and regional MPIs. Yet some of these MPIs also include indicators related to tenure and location.

In *developed countries*, indicators of housing materials and energy are ignored (presumably virtually all dwellings satisfy the minimum standards). Instead, commonly included indicators in Europe have been as follows (Townsend, 1979; Mack and Lansley, 1980; Nolan and Whelan, 2011).

Indicators related to availability of different services and infrastructure:

- having bath or shower in the household,
- having an indoor flushing toilet,
- hot running water.

Indicators related to habitability:

- presence of leaky roof,
- damp in walls, floors or foundation,
- rot in window frames or floor,
- having the possibility to keep the house warm,
- house is too dark/not enough light,
- overcrowding, and
- the presence of some items in the household (such as dishwasher, telephone, colour TV, microwave, washing machine).

Indicators related to location:

- pollution and other environmental problems (self-reported),
- noise from neighbours or from the street,
- crime, violence or vandalism in the area were also frequently included.[11]

Scotland's *Tolerable Standard* additionally includes an indicator of the dwelling's stability (not likely to collapse) and satisfactory facilities for the cooking of food within the dwelling (Atkinson et al, 2002, pp.159–160). Europe also typically includes an indicator of affordability of the dwelling.

[10] See also Santos (2014).

[11] The European Community Household Panel Survey (ECHP) used until 2001 and replaced by the EU-Statistics on Income and Living Conditions (EU-SILC) in 2003 included questions that capture these aspects.

Eurostat (2017) has defined six indicators to monitor SDG 1 and four other complementary "multipurpose indicators", many of which follow Atkinson et al. (2002, pp. 160–161) proposed indicators for Europe. Among the six indicators are:

(1) The share of total population living in a dwelling with a leaking rook, damp walls, floors or foundation or rot in window frames or floor;

(2) The housing cost overburden rate;

(3) Proportion of people severely materially deprived, defined as the enforced inability to pay for at least four out of nine items, including keeping the home adequately warm, having a television set, a washing machine, a car, or a telephone.[12] One of the complementary indicators is the share of total population having neither a bath, nor a shower, nor an indoor flushing toilet in their household.

The habitat sphere is also matter of SDG 11 ("Make cities and human settlements inclusive, safe, resilient *and sustainable*"), with Targets 11.1, 11.2 and 11.6 being strongly linked to the indicators analysed here.[13] There are also linkages to SDG 12 ("Ensure sustainable consumption and production patterns"), SDG 13 ("Take urgent action to combat climate change and its impacts"), and SDG 15 ("...sustainable use of terrestrial ecosystems..."). These simultaneous goals pose an important challenge: reducing poverty in a *sustainable* way.

> "The window for making the right choices is uncomfortably narrow because of lock-in of capital and technology and (…) a shrinking carbon budget. (...) We have a historic opportunity to deliver inclusive economic growth, eliminate poverty and reduce the risk of climate change".[14]

Consistency across the indicators used to monitor the different SDG targets needs to be assured. Otherwise contradictions may arise, such as a reduction in people living in inadequate housing alongside an increase in CO_2 emissions or an increase in the proportion of urban solid waste *without* adequate final discharge. Conversely, financial support to the least developed countries allocated to the construction of sustainable buildings utilizing local materials (Target 11.C) may increase alongside an increase in the proportion of people with "inadequate housing". In certain cases, consistency may require a revision of survey response categories and questions.

A. Housing

1. Housing materials

The dwelling is a unit composed of three elements: floor, walls and roof. The materials and ways in which these have been built, as well as the dimensions, will determine the dwelling's quality (INDEC, 2003) and adequacy (SDG target 11.1.1). Key characteristics of each of these three elements are their (a) durability,[15] (b) thermal insulation, (c) waterproofness, and (d) fire resistance (UN-Habitat, 2003; INDEC, 2003).

Each of the properties (b) through (d) may be more or less important depending on the climate. Additional properties may be considered in certain areas, such as resistance to earthquakes, typhoons, hurricanes or some other potential natural extreme condition and/or shock (UN-Habitat, 2003; INDEC, 2003; UN-Habitat, 2012).

There are obvious health risks associated with inadequate dwelling materials, including vulnerability to rodents and cockroaches, which transmit diseases (Matte and Jacobs, 2000); acute

[12] Items detailed in section I.A.4.

[13] Target 11.1 reads "ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums". Target 11.2 reads "provide access to safe, affordable, accessible and sustainable transport systems for all". Target 11.6 states "reduce the adverse per capita environmental impact of cities, by paying special attention to air quality and municipal and other waste management".

[14] GCEC, 2016.

[15] A house is durable if it is built in a non-dangerous place and has a permanent structure, adequate enough to protect its habitants from rain, heat, cold and damp (UN-Habitat, 2003, p. 19).

respiratory infections (Suriyasa et al., 2006); the development of allergies and asthma (Matte and Jacobs, 2000); intestinal parasites (Carmona-Fonseca et al., 2014; Srinivasan et al, 2016); and Chagas disease (Costa et al., 1998), among others. Inadequately built houses are also obviously vulnerable to collapse under strong weather conditions. Beyond this, inadequate shelter also influences the psychological state of its dwellers by failing to provide the safety, privacy and security a home is supposed to offer. Deprived housing materials are perhaps one of the most visible aspects of poverty, with impacts on many other dimensions.

a) Indicators, standards and available data

Both censuses and household surveys in developing countries collect information on the predominant material of some or all of these housing components: floor, walls and roof. Table 5, Table 6 and table 7 present different materials included as response categories in most prevalent surveys for floor, walls and roof, correspondingly. These materials were grouped in three ordered categories: natural and waste, rudimentary, and finished.[16] Questionnaires also include the category "other material" and ask that it be specified. The implicit classification is that "finished" materials have the necessary treatment for thermal insulation and waterproofing, whereas rudimentary, natural and waste materials lack such treatment. However, rudimentary materials are supposed to be better than those from natural and waste materials because they are "recoverable", i.e. could be made better if an appropriate treatment was applied (Muñoz, 2008).

While the DHS/MICS list of materials in the household questionnaire is homogeneous across countries, it is not exhaustive. Also, wood planks are considered "finished" for walls but "rudimentary" for floor and roof, which is an inconsistency as they need some form of covering, plastering, or — at least — painting for thermic insulation and waterproofing to be adequate in floor, walls or roof.

As detailed in table 5, table 6 and table 7 , a widely accepted international standard evident in the DHS/MICS/MPPN questionnaires is to consider natural and waste materials as deprived/inadequate. This criterion has been used in the global MPI, although only flooring was considered. It has also been used for the three elements (floor, walls, roof) in the MPI-LA, in the Arab MPI (for floor and roof, to identify acute poverty), in Nepal's MPI (for floor and roof) and in Bhutan's MPI (for floors, walls and roof).

However, standards used at country and regional levels sometimes also consider some of the "rudimentary" materials as deprived. This is the case for the Arab MPI (in the more demanding set of deprivation thresholds) for floor (cement floors with no slab, tiles or asphalt strips are considered deprived) and roof (rustic mat, palm, bamboo, wood planks or cardboard are considered deprived). It is also the case in the national MPIs of Mexico, El Salvador, Colombia, Panama and Dominican Republic with respect to the deprivation thresholds defined for wall materials. Specifically, these countries consider dwellings with walls made of wood planks, cardboard, bamboo with mud, or zinc as deprived. Honduras considers dwellings with bahareque walls as deprived, and Panama considers dwellings with quincha walls as deprived. Yet, these materials may not always be inadequate. Also note that because of the now well-known health risks, Dominican Republic considers roofs made of asbestos as deprived, even when these are "finished".

Not all countries enquire about the three elements (floor, walls and roof) in their surveys and, even if they do, not all countries use information on the three elements as indicators of poverty. In the Latin American region, the national MPIs of Mexico, El Salvador and Ecuador use information about floor, wall and roof materials, and this is also the case in Bhutan's MPI. In Costa Rica and in the Arab MPI only information on floor and roof materials is used. In Colombia only the floor indicator is used (but in both cases information on wall materials is available), and in Pakistan only information on wall materials is used. Whenever more than one indicator is considered, a union criterion is most typically used, such that if there is deprivation in any of the materials, the household is considered deprived in housing. Bhutan uses an intermediate criterion: the household is deprived in housing materials if it is deprived in at least two of three of the materials for flooring, walls or roofing. Notably, there have been proposals to construct indices of the quality of the materials of the

[16] DHS, MICS and the OPHI-MPPN survey do not include waste materials alongside natural. Yet, given that LSMS include the "waste materials" response category and given that it is a deprived material, it is grouped alongside natural materials (but it can be a separate category).

dwelling (INDEC, 2003,[17] Muñoz, 2008). South Africa's MPI uses information on dwelling type (a household is deprived if the dwelling is an informal shack/traditional dwelling/caravan/tent/other).

Table 5
International standards on housing materials and typical survey question – floor

The predominant floor material		
Floor material	**Minimum International standards**	**Higher Regional standards**
Natural and waste		
Earth/dirt/sand	D	D
Dung	D	D
Rudimentary		
Wood planks	ND	D
Palm/bamboo	ND	D
Loose bricks*	ND	D
Finished		
Parquet or polished wood	ND	ND
Vinyl or asphalt strips	ND	ND
Ceramic tiles	ND	ND
Cement or concrete	ND	ND
Carpet	ND	ND
Fixed bricks	ND	ND

Source: DHS, MICS, MMPN and LSMS survey questionnaires.
Notes: D is deprived; ND is non-deprived. *Do not appear as categories in DHS, MICS and MPPN surveys but are included in LSMS-type of surveys in Latin America.

Table 6
International standards on housing materials and typical survey question – roof

The predominant material of roof		
Roof material	**Minimum international standards**	**Higher used regional standards**
Natural and waste		
No roof	D	D
Thatch/palm leaf/grass	D	D
Sod	D	D
Waste material	D	D
Rudimentary		
Rustic mat	ND	D
Palm/bamboo	ND	D
Wood planks	ND	D
Cardboard	ND	D
Finished		
Metal	ND	ND
Calamine/fibre cement	ND	ND
Wood	ND	ND
Ceramic tiles	ND	ND
Cement	ND	ND
Roofing shingles	ND	ND
Concrete slab	ND	ND
Asbestos	D	D
Membrane/ asphalt cover/shingle	ND	ND

Source: DHS, MICS, MMPN and LSMS survey questionnaires.
Notes: D is deprived; ND is non-deprived.

[17] Each of the three elements (floor, walls and roof) is assigned a score between 'good', 'regular' or 'bad'. Then the scores are aggregated to obtain an overall score. A five categories scale was built. In the case of Muñoz (2008), a three category aggregate indicator is proposed: 'acceptable' (floor, roof and walls have acceptable materials); 'recoverable' if the material of at least one element is recoverable and the other/s are acceptable; or non-recoverable if none of the three materials is recoverable.

Table 7
International standards on housing materials and typical survey question – walls

The predominant material of external walls		
Walls material	**Minimum international standards**	**Higher regional standards**
Natural and waste		
No walls	D	D
Cane/palm/trunk/yagua[a]	D	D
Dirt	D	D
Waste materials*	D	D
Rudimentary		
Bamboo with mud	ND	D
Stone with mud	ND	D
Uncovered adobe	ND	D
Bahareque/quincha		
Plywood	ND	D
Cardboard	ND	D
Reused wood	ND	D
Zinc*	ND	D
Wood planks/shingles**	ND	D
Canvas***	ND	D
Logs***	ND	D
Unbaked bricks***	ND	D
Finished		
Cement (or concrete*)	ND	ND
Stone with lime/cement	ND	ND
Bricks	ND	ND
Cement blocks	ND	ND
Covered adobe	ND	ND
Asbestos*	D	D

Source: A combination of DHS, MICS, MMPN and LSMS survey questionnaires.
[a] Yagua: a kind of palm, frequently used by indigenous populations.
*Do not appear as categories in DHS, MICS and MPPN surveys but are included in LSMS-type of surveys in Latin America.
**Wood Planks are considered "finished" in DHS and MICS survey questionnaire, but it seems inconsistent with the category for floor and roof.
*** Do not appear as categories in DHS, MICS and MPPN surveys but are included in LSMS questionnaires.

In developed countries, specifically, in the EU countries where the EU-SILC survey is used, the housing indicators are:

- presence of leaky roof;
- damp walls, floors or foundation;
- rot in window frames or floor;
- having the possibility to keep the house warm; and
- house is too dark/not enough light.

Note that with five simple questions it may be possible to capture the main problems that inadequate materials or inadequately treated materials produce. The questions also capture the state of conservation of the dwelling. These questions may be good discriminant indicators of the habitability of the dwelling. It seems clear that dwellings that would be considered deprived in housing materials will also be considered deprived with these questions, as they will surely exhibit signs of damp, rot or leakiness. At the same time, it seems that dwellings that may not be considered deprived when considering their materials, can yet show observable signs of damp, rot, leakiness or impossibility to be properly heated. In other words, it may be possible to reduce the exclusion error by simplifying the survey questions to more

easily observable indicators. Interestingly, these kinds of questions are being included in Costa Rica's and Uruguay's regular household surveys. These are detailed in table 8.

Table 8
Housing questions used in developing countries similar to EU-SILC questions

Does your household have any of the following characteristics?	
(Floor)	
1. Floor is damp or rotten, or has mould or termites	No Yes, more than half of the dwelling is affected by this. Yes, less than half of the dwelling is affected by this.
2. Floor has cracks	No Yes, more than half of the dwelling is affected by this. Yes, less than half of the dwelling is affected by this.
3. Parts of the floor (tiles or other) are missing, or the floor is inclined	Yes No
(Walls)	
4. Exterior walls are inclined	Yes No
5. Exterior walls are damp or rotten, or have mould or termites	No Yes, more than half of the dwelling is affected by this. Yes, less than half of the dwelling is affected by this
6. Exterior walls have cracks or holes that let the light pass through them	No Yes, more than half of the dwelling is affected by this. Yes, less than half of the dwelling is affected by this
(Roof)	
7. Roof leaks, is damp or rusty, or has pieces missing?	No Yes, more than half of the dwelling is affected by this. Yes, less than half of the dwelling is affected by this
8. Roof is rotten or has termites?	No Yes, more than half of the dwelling is affected by this. Yes, less than half of the dwelling is affected by this
(General)	
9. Not enough lighting	Yes/No
10. Not enough ventilation	Yes/No
11. Is in danger of collapsing	Yes/No

Source: A combination of questions from (INE, 2014, Encuesta Continua de Hogares of Uruguay) and some pilot questions on housing suggested by the Ministerio de Vivienda y Asentamientos Urbanos of Costa Rica (MIVAH, 2018).

The MPI-EU includes an indicator on housing based on these EU-SILC questions. Relatedly, Armenia's MPI includes an adequate housing indicator on self-reported (subjective) satisfaction on a broad set of issues (floor area, noise, lighting, heating, humidity, leaking roof, dilapidated walls and floor, dilapidated window frames and doors, heavy traffic, industrial pollution, elevator functioning, water quality, garbage removal, services for common areas and yards). This MPI also includes an indicator for subjective housing conditions. Malaysia's MPI uses an indicator for "dilapidated or deteriorated" housing conditions.

Table 9 details the availability of housing indicators across reviewed surveys. About a third of the reviewed surveys contain information on housing materials, but this essentially excludes more developed countries which, in contrast, contain information on the other more observable dwelling deficiencies (40% of surveys, all EU-SILC).

Table 9
Data availability on non-monetary poverty indicators, part I
number of surveys considered with available information
(Percentages are over total number of surveys considered in each region)

Region	Floor material	Roof material	Wall material	Floor, roof *and* walls	Leaking roof, damp walls/ floor/ foundation window rot	Number of rooms	Number of bedrooms	Housing tenure	Durable goods
East Asia & Pacific	26 (33%)	33 (42%)	33 (42%)	26 (33%)		40 (51%)	15 (19%)	49 (63%)	47 (60%)
Europe & Central Asia	12 (3%)	13 (3%)	13 (3%)	12 (3%)	384 (95%)[a]	401 (99%)	5 (1%)[c]	398 (98%)	404 (100%)
Latin America & Caribbean	212 (86%)	212 (86%)	212 (86%)	186 (76%)		210 (85%)	88 (35%)	233 (95%)	202 (82%)
Middle East and North Asia	36 (19%)	22 (12%)	33 (17%)	20 (11%)	10 (5%)[b]	47 (25%)	35 (27%)	56 (43%)	62 (48%0
South Asia	17 (63%)	26 (96%)	26 (96%)	17 (63%)		26 (96%)	12 (44%)	26 (96%)	27 (100%)
Total	303 (32%)	306 (32%)	317 (33%)	261 (27%)	394 (42%)	724 (77%)	155 (17%)	762 (83%)	742 (84%)

Source: Own elaboration based on DAPI.
[a] All are EU-SILC surveys
[b] These are EU-SILC surveys of Malta only.
[c] Some EU-SILC surveys (the UK one, for example) include a question on rooms used for sleeping, but this has not been revised one-by-one; thus this number is an underestimation.

b) Discussion and recommendations

In view of the above, a few points are worth noting. First, there is still need to work towards a more comprehensive international consensus regarding the adequacy of the different materials. This is particularly evident for the materials within the "rudimentary" category, which is quite a fuzzy category. Response categories need to be carefully designed, ideally keeping each material as a separate category. If different materials are grouped, adequate and inadequate materials cannot be within the same response category (although, obviously, this is sometimes the case).

Second, recording the main material of floors, walls and roofs is often insufficient to determine whether there is deprivation or not. A complementary question on whether each element has the required finishing treatment seems to be quite important, especially for rudimentary materials. An untreated palm/bamboo floor is clearly inadequate; yet treated or engineered bamboo is adequate. Plywood, cardboard or reused wood walls alone are certainly inadequate, but if they have some external coverage, they can be adequate. Conversely, a metal roof without a ceiling does not protect residents from extreme temperatures and it is therefore not adequate, even when it is within the "finished materials" category in the DHS/MICS/OPHI-MPPN questionnaires. The Argentinean census questionnaire includes a question on whether the walls have external cladding/revoke and a question on whether the roof has ceiling. These two additional questions may allow better identification of deprivations.

Third, the considered classification responds to mainstream building methods, where cement, concrete, tiles, bricks and shingles are the materials considered the most adequate, as they provide proper

insulation and are suitable for all climates. Yet, the SDGs call for a radical change in development and can be taken as a lever to foster a kind of economic growth and human development that does not copy the high-carbon model that developed countries have followed.

The traditionally preferred building materials are precisely the most environmentally harmful as they have significant embedded emissions because of their carbon-intensive manufacture. It would be ideal if some of the sustainable construction technologies were scaled up. The SDGs can become a powerful tool for advancing that goal. UN-Habitat (2012) offers an insightful guide on sustainable construction materials and techniques using natural materials that offer adequate housing.

In their current state, household surveys cannot register these kinds of sustainable building practices, which are based on natural but properly treated materials. Yet they seem to be *the way* to extend adequate housing and city developments sustainably (SDG 11.6, in particular, and SDGs 11, 12, 13, and 15, in general). Moreover, in many contexts, these techniques are particularly adequate from a cultural point of view (requirement 7 of the CESCR, 1991).[18]

Increasing the use of these sustainable building techniques is not easy to achieve, especially in middle-income countries where people tend to construct new homes that are based on long-established models and that use traditional building materials. Developed countries would also need to increase the use of these techniques for equity reasons and to actually have an impact on reducing global warming. States need to take the lead in this matter, providing the necessary regulations, the right economic incentives and implementing pioneering social housing policies.

If these sustainable building techniques are scaled up, it will be necessary to properly include them in regular surveys, taking into consideration not just the materials (for example, earth) but also the treatment (for example, cob, rammed or compressed earth, or earthship). The difficulty in identifying deprivation when natural materials are used has been raised by Kaztman (2011) and Villatoro (2017a).[19] However, the SDGs should constitute an opportunity to improve the data that is collected.

A particular note relates to fibre cement. Since the 1990s, it is well known that cement fibre is inadequate if it includes asbestos because of the associated cancer risk. Asbestos has been banned in most countries, but at different years and to different extents. Constructions prior to the year in which asbestos was banned in each country may contain this building material, which is difficult to identify as it is mixed with other materials. In some countries, such as El Salvador, this building material is still quite prevalent, even among the income non-poor; thus considering the presence of this material as indicating deprivation may affect the non-monetary poverty estimates significantly in such countries (Kaztman, 2011). Yet, it is also true that the income poor and households experiencing multiple deprivations (even if not income poor) are in a position in which it is much more difficult to replace this roof material. There is now strong evidence of the asbestos' health risks, and there is an international consensus that asbestos should be eliminated (see, for example, WHO, 2007). The SDGs should be unambiguous about (a) identifying the presence of asbestos in building materials, and (b) considering such materials to be inadequate.[20] While the presence of asbestos fibres is not directly observable, it could be inferred from (a) observation of cement fibre material and (b) a question about the date when the dwelling was built and whether or not the roof has been replaced since then and if so, when.

The recommendations above, which are oriented towards promoting a more accurate and comprehensive identification of deprivations in terms of housing materials, require building more consensus, spelling out more carefully different building materials, and adding a few more questions and possibly better enumerator training. Thus, the route followed by European countries (and recently by Uruguay and Costa Rica), which use questions such as those in table 8, may be a more straightforward way of proceeding. It implies moving from recording building materials to directly identifying the

[18] Also see UN-Habitat (2014a).

[19] Kaztman (2011) suggests that, under data constraints, it would be possible to discriminate deprived dwellings from non-deprived based on the floor materials. In fact, this is the case of the global MPI.

[20] Moreover, there is no evidence of a threshold for the carcinogenic effects of asbestos. Thus, the most efficient way to eliminate asbestos-related diseases is to stop using all types of asbestos (ILO-WHO, 2007).

observable problems that inadequate building materials generate. Such questions do not favour one type of building material or the other, and do not need to be adapted to one type of climate or another. A testing module of this nature could be incorporated into regular household surveys in sample developing countries in each region alongside the housing material questions, and analysis performed to evaluate the discriminant power of these simpler questions. Some exploration can already be done with data from Uruguay and Costa Rica.

2. Overcrowding

Overcrowding is considered risk factor for physical health, mental health and child development. Its contribution to the propagation of respiratory diseases, tuberculosis and allergies is frequently mentioned. Overcrowding is also considered to contribute to children's lack of concentration when doing homework or even playing, and it can thus affect the academic performance of children and contribute to failure in school (Kaztman, 1995; Goux and Maurin, 2005). However, disentangling the independent effect of overcrowding on health is not straightforward, as overcrowding is one of many housing conditions, and it may be correlated with other socio-economic variables as well; moreover overcrowding may have both direct and indirect effects on health and child development (ODPM, 2004; Goodyear, Fabian and Hay, 2011).[21] While more research is needed to better support the link between overcrowding and different specific health conditions, overcrowding is undeniably an indicator of an unsatisfied need for privacy (Kaztman, 1995) and — more generally — of inadequate habitability (requirement 4 of CESCR, 1991).

a) Indicators, standards and available data

There is no overcrowding indicator as such among the SDG indicators, although it is evidently linked to Target 1.2.2. Different indicators of overcrowding have been used, and they cover essentially four options:

(i) Floor area per person in the dwelling (FAPP),
(ii) Number of people per room in the dwelling (PPR),
(iii) Number of people per bedroom in the dwelling (PPB), and
(iv) Number of bedrooms available in relation to the number of bedrooms required according to the demographic composition of the household.
(v) Another indicator less often used is
(vi) Number of people in the dwelling.
(vii) But this is clearly an insufficient indicator, as it does not consider the dwelling size (WHO s/d).

Table 10 synthesizes the different available overcrowding indicators and their corresponding most commonly used thresholds.

UN (2003, p. 97) claims that "surveys have shown that floor area per person is the most precise and most policy sensitive of the three", but there is no international minimum standard (Blake, Kellerson and Simic, 2007, p. 8). The Sphere Project recommends a minimum of 3.5m^2 per person, but this is in the context of humanitarian response to some kind of disaster.[22] At the other end, Blake, Kellerson and Simic (2007) used a standard of 15m^2 per person.[23]

A related option that could be explored is the minimum square meters that social housing must provide. Such a standard may vary across countries due to different levels of development, cultural norms, geographic conditions and so on. For example, in Chile, emergency houses need to have a minimum area of 16 m^2 and 4 m^2 per person, and height from floor to ceiling needs to be at least of 2.2 metres (CDC, 2014). This is similar to the Sphere Project standards. In Colombia, the minimum land area for building a

[21] ODPM (2004) offers a critical assessment of the evidence of the impact of overcrowding on health, child development and education. There is evidence of an independent effect of overcrowding on: some infectious diseases, meningitis, respiratory conditions in children, childhood tuberculosis, *H. Pylori* infection in childhood and acute rheumatic fever (Goodyear, Fabian and Hay, 2011). There is also evidence of a relationship between overcrowding in childhood and respiratory conditions in adulthood, poor self-rated health, and on social and emotional development in children (ODPM, 2004).

[22] It also recommends a minimum of two metres of internal floor-to-ceiling height at the highest point.

[23] However, this standard was set because it produced the same proportion of overcrowded households as the PPR indicator, using the American Household Survey data for 2005.

dwelling for one household is 35 m^2 (MAVD , 2011).[24] In the Buenos Aires Province in Argentina, the allowed minimum size for building a bedroom is between 8 and 9 m^2.[25] So, there seems to be some agreement on the minimum size of rooms across countries.[26] The obvious drawback is that this is a floor area with no reference to the number of people occupying it, although implicitly one may think that 8 m^2 can accommodate no more than two people.

For the time being however, the information on floor area is rarely available from household surveys. In fact, the PPR is the indicator most frequently used (UN, 2003; UN-Habitat, 2015; Blake, Kellerson and Simic, 2007; Goodyear, Fabian and Hay, 2011).[27] The threshold of PPR over which a household is considered overcrowded varies greatly, and this is because there is no agreed upon international standard (Villatoro, 2017a). PPR has been used in measures of UBN in Latin America, in many of the studies assessed in ODPM (2004) and in the recently proposed official measures of multidimensional poverty. It is also one of the Eurostat Key Indicators, and it is recommended as a lead social indicator for Europe by Atkinson et al. (2002).

While PPR does not consider the actual square metres per person, it is still informative because "customs and building codes will establish either a de facto or an explicit minimum size for rooms to be considered healthy and safe" (Blake, Kellerson and Simic, 2007, p. 5). The PPR indicator considers rooms in general, excluding bathrooms, toilets, kitchen, corridors, garages and balconies. UN (2003) also mentions excluding verandas, rooms used for business and rooms let to tenants. The actual implementation of the index (i.e. which kind of rooms it effectively excludes) depends on the specification of the question in the household survey used. LSMS surveys typically collect information on the total number of rooms excluding bathrooms, kitchens, balconies and corridors, and also usually asks about how many, if any, of these rooms are used primarily as bedrooms.[28] Regular household surveys in Latin America have these LSMS questions. DHS does not ask for the total number of rooms in the dwelling but rather whether there is a separate room used as a kitchen, and the number of rooms in the household that are used for sleeping. MICS only asks about the number of rooms used for sleeping table 9 shows that just above 75% of reviewed surveys contain information on the number of rooms, whereas just 17% contain information on the number of rooms used for sleeping (although this is an underestimation because not all surveys were checked for this question, this information is certainly much less frequent).

Developed countries most frequently use a threshold of *more than one person per room as overcrowding*, and more than 1.5 persons per room as severe overcrowding (Goodyear, Fabian and Hay, 2011). Blake, Kellerson and Simic (2007) argue that the one person per room threshold is an intuitive standard "considering occupancy of the rooms which are pressed into service as sleeping quarters", which is clearly far from ideal. The United States Census Bureau uses a standard of one person. This is also the suggested standard by Atkinson et al. (2002) for Europe.

Yet in developing countries, the threshold used has been much less demanding. Back in 1967, the United Nations defined overcrowding as *three or more people per room* (NU, 1967). Many studies still use the same threshold (Bouillon, 2012). In Latin America *more than* three people per room has typically been considered as critical overcrowding in measures of UBN.[29] Kaztman (1995) recommends using *more than two people per room*, as this implies that a couple with a child living in one room will be considered as being overcrowded; so will a household with five or more people living in two rooms, and so on. Considerations of this nature have also been included in guidelines for social housing in Colombia (MAVD, 2011). However, the currently used threshold for identifying overcrowding in official MPI indices in Latin American countries that use the PPR indicator varies from more than 2.5 PPR (Mexico),

[24] Minimum land area for two households is 70 m^2 and for three households, it is 120 m^2.

[25] http://www2.cedom.gob.ar/es/legislacion/normas/codigos/edifica/4_6.html.

[26] A more in-depth cross-country comparison review could be performed to obtain broader and more substantive support for a minimum room size as a reference.

[27] Note that the PPR indicator was included as an additional socio-economic common country assessment indicator for the Millennium Development Goals (UN, 2003).

[28] LSMS surveys usually ask the number of rooms that are used primarily for family enterprise or trade. The specific type of rooms ignored in the room count (corridors, garage, etc.) vary across countries (Villatoro, 2017).

[29] This is also the criterion used in Rojas and Medellin (2011).

three or more PPR (Honduras), to more than three PPR (rural Colombia) (Villatoro, 2017a). In Pakistan's and Mozambique's MPI as well as in the Arab MPI a threshold of four or more people per room is used.

PPB is intended to be a more accurate indicator of overcrowding as it considers the rooms that are actually used for sleeping (CELADE, 1996 and UN-Habitat, 2015).[30] Again, the thresholds used vary: 2 PPB (Blake, Kellerson and Simic, 2007, p. 5, for the US; Hancevich and Steinbrum, 2009 for Argentina), 2.5 PPB (Chile's MPI), 3 PPB (El Salvador and Panama's MPI, and Colombia's MPI in urban areas) (see Villatoro, 2017a, p.15–16), although this last threshold is frequently considered as severe overcrowding.[31]

Neither PPR nor PPB considers demographic factors that affect overcrowding, such as the age and sex of household members (Goodyear, Fabian and Hay, 2011). However, many developed countries use an indicator that considers demographic aspects. One prominent indicator is that used by Eurostat for countries of the European Union, which is detailed in table 10.[32] Other overcrowding indices that consider the demographic composition of the household include the Equivalised Crowding Index (ECI) used in New Zealand, the Canadian National Occupancy Standard and the British Bedroom Standard (Goodyear, Fabian and Hay, 2011 and Villatoro, 2017a). The Eurostat indicator seems a reasonable requirement (in terms of rooms in general) when compared to the others. ECI might be seen as too demanding in requiring one separate bedroom per person above ten years old. The Canadian Index requires a separate bedroom at 18 years old, as well as a separate bedroom for children five years old onwards who are different sexes; the British standards are 21 and 10 years old, correspondingly.

A related notion to overcrowding is that of co-residence (in Spanish "allegamiento"). There are three different concepts of co-residence (CEPAL, 1996; UN-Habitat, 2015):

External co-residence is defined as when there is more than one household in the dwelling, and they have separate budgets and cook separately,

Internal co-residence is when there is more than one nuclear family within a household (three generations, for example) who also share the budget.

In-situ co-residence is when several households live in dwellings located in the same land court.

External co-residence (or more than one household in a dwelling) is the indicator most frequently used to compute a housing deficit. This indicator can be computed with most regular household surveys as they enquire about different households living in the same dwelling. Alençon et al. (2008) propose as a minimum requirement for external co-residence that there is one household per 44m2 of dwelling.

[30] There is also the indicator of people per bed, collected in more specific surveys of housing conditions (Mitchell, Macció and Fages, 2016).
[31] In Chile, five PPB is considered critical overcrowding (Muñoz, 2008).
[32] http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary: _rate Retrieved October 26, 2017.

Table 10
Summary of indicators of overcrowding most commonly used

Overcrowding index	Threshold or definition: Overcrowded if...	Countries/institutions/studies that use this indicator
Considering floor area per person		
Floor Area Per Person (FAPP)	Less than 3.5m2/person	The Sphere Project (Sphere, 2017a)
	Less than 8m2/person	Vietnam's MPI
	Less than 15 m^2/person (165 sq. feet/person)	Blake et al. (2007)
Considering rooms in general (ignoring demographic composition)		
People per Room (PPR) (excluding bathrooms, toilets, kitchen, corridors, garages and balconies)	More than one person per room	US, recommended for EU countries
	More than two people per room	Kaztman (1995)
	More than 2.5	
	Three or more people per room	UN (1967), BID (2012), MPI Mexico, Arab MPI (for poverty)
	More than three people per room	UBN measures in Latin America and MPI in rural Colombia
	Four or more	Mozambique and Pakistan's MPI, Arab MPI (for acute poverty)
Considering rooms used for sleeping (ignoring demographic composition)		
People per Bedroom (PPB)	More than two people per room	US and Argentina
	2.5 people or more	Chile's MPI (Celade, 1996)
	3 or more	El Salvador, urban Colombia and Panama's MPIs
Considering the demographic composition of the household (but rooms in general)		
Eurostat	The household does not have at its disposal a minimum number of rooms equal to • one room for the household, • one room per couple in the household, • one room for each single person aged 18 or more, • one room per pair of single people of the same gender between 12 and 17 years of age, • one room for each single person between 12 and 17 years of age and not included in the previous category, • one room per pair of children under 12 years of age.	European Union countries Armenia's MPI
Considering rooms used for sleeping and the demographic composition of the household		
Equivalised Crowding Index (ECI)	$\frac{0.5 * NCH_{<10} + NCO + RP_{>10}}{NB} > 1$	New Zealand
Considering rooms used for sleeping and the demographic composition of the household		
Canadian National Occupancy Standard (CNOS)	The dwelling requires extra bedrooms in order to meet the following criteria: • There should be no more than two people per bedroom; parents or couples share a bedroom. • Children aged less than five years, either of same or opposite sex, may reasonably share a bedroom. • Children aged less than 18 years, of the same sex, may reasonably share a bedroom. • A child aged five to 17 years should not share a bedroom with a child aged over five years of the opposite sex. • Single adults aged 18 years and over, and any unpaired children, require a separate bedroom.	Australia Canada (but not by Statistics Canada) New Zealand
British Bedroom Standard	The dwelling requires extra bedrooms such that a separate bedroom is allocated to • each married or cohabiting couple, • any other person aged 21 years and over, • each pair of adolescents, aged 10 to 20 years, of the same sex, or • each pair of children aged under 10 years.	United Kingdom

Source: Own elaboration based on Villatoro (2017a), Goodyear, Fabian and Hay (2011), and http://m.stats.govt.nz/tools_and_services/nzdotstat/tables-by-subject/housing-quality-tables/crowding-occupancy-rate.aspx.
Note: $NCH_{<10}$ is the number of children under 10; NCO is the number of couples; $RP_{>10}$ is the rest of people aged 10 and over; NB is the number of bedrooms.

b) Discussion and recommendations

Despite the fact that there are different overcrowding indicators, comparative analysis suggests that they tend to coincide in terms of rankings, although obviously not in terms of the estimated magnitude and specific households identified as overcrowded. Villatoro (2017a) finds that the ranking of Latin American countries in terms of overcrowding as measured by the PPR indicator is robust to using alternative thresholds. Blake, Kellerson and Simic (2007) produced a cross tabulation between the indicator of PPR and FAPP for 1985 and 2005. They found that half of the households that were overcrowded according to PPR were also overcrowded according to FAPP, and about 40% of households that were overcrowded according to FAPP were also overcrowded according to PPR. Thus while there is a significant overlap between the two measures, there is also a sizeable divergence. The authors recommend using an intersection criterion and identifying households as overcrowded when they do not satisfy either of the two thresholds (PPR *and* FAPP).

It seems clear that the dashboard of overcrowding indicators is ample. It would be of tremendous help to converge on a minimum international standard that all countries could use to track progress.

The Eurostat indicator, which considers the demographic composition of the household in setting the number of required rooms, seems a very desirable measure, but there may be disagreement about the standards it sets and it is computationally more demanding (although the demographic composition of the household is always available in household surveys).

Building an international consensus on the minimum square metres per person based on social housing requirements across countries is an interesting route to explore, but it will demand including a question on total square meters of the dwelling, which is not the current practice.

In the immediate future, the PPB indicator seems to be a good compromise. This is because (a) most household surveys include a question about the rooms used for sleeping, and, if not, it is a relatively simple question to incorporate; (b) while it does not explicitly consider the demographic composition of the household, it is more accurate than PPR, as it only considers rooms that are actually used for sleeping, and the threshold can be set at two people per bedroom so as to assure, at least, that couples have a separate room from their children (Kaztman, 1995); and (c) while it does not explicitly consider the floor area, it does, as argued above, do so implicitly, as building codes set minimum floor areas. Of course, slum houses do not typically follow or satisfy any such codes, but this information can be recovered by simpler questions than the one about the square meters of the dwelling, such the "type" of house and/or whether it is located in a slum area. If it is not possible to generalise the inclusion of a question on the number of rooms used for sleeping in surveys across the world, then the PPR indicator will prevail, and this is still very informative.[33]

The indicator of external co-residence, that is, different households living in the same dwelling is a recommended complementary indicator, in that it better informs policy by revealing whether the overcrowding of a dwelling can be addressed by more rooms within the same dwelling unit or if a separate dwelling is instead required.

3. Housing tenure

Security of tenure is understood as a set of relationships with respect to housing and land, established through statutory or customary law or informal or hybrid arrangements, that enables one to live in one's home in security, peace and dignity. It is an integral part of the right to adequate housing and a necessary ingredient for the enjoyment of many other civil, cultural, economic, political and social rights. (...) Security of tenure guarantees that people access and enjoy their home without fear of forced evictions, and enables them to improve their housing and living conditions (UN, 2013).[34]

[33] In countries where the survey question on the total number of rooms does not exclude kitchen and/or toilet, the PPR can be corrected using Kaztman's (2011) suggestion of subtracting one from the total number of rooms.

[34] All persons should possess a degree of security of tenure that guarantees legal protection against forced eviction, harassment and other threats (CESCR, 1991, General Comment No. 4).

It also gives the right to parents to pass their land or housing to their children (UN-Habitat, 2007). Secure tenure is also considered to contribute to poverty reduction and to enhance economic development and the sustainable use of resources as well as social stability (FAO, 2003; UN-Habitat, 2014b).[35]

Several groups are particularly vulnerable to experiencing lack of tenure: women (tenure usually depends on their relationship with a man) (NRC-IFRC, 2013), indigenous groups (community-based tenure is frequently not recognised by governments) (RRI, 2015), the displaced and refugees. While the specificities of these groups are not covered here, it is recommended that, whenever possible, tenure indicators are cross-matched with the characteristics that define these vulnerable groups to create group-specific indicators.

Importantly, secure tenure is now increasingly seen as a *continuum* of different forms and arrangements that vary in the degree of the rights and security they assure and the responsibility they convey (UN, 2013; UN-Habitat, 2011, 2014; Antonio et al., 2017, to mention a few). Freehold or registered leasehold of land enforces the full set of rights that allow a person to occupy, use, develop, rent, sublet, benefit from increased property values or rental income, inherit and transfer their property. Other tenure systems (for example, customary, occupancy, anti-eviction, adverse possession or group tenure) enforce only some of these rights (Sida, 2007). Clearly, documented land rights also facilitate other rights and opportunities such as civic and political participation, access to basic services and to bank credit (UN-Habitat, 2008, p. 6; FAO, 2003).

Evidence has shown that policies that promote individual freehold as the sole instrument of tenure security have often been counterproductive, putting at risk the tenure status of urban and peri-urban populations – particularly the poorest (UN, 2013).[36] The "essence (de facto status of tenure security) is more vital to people than form (de jure tenure security)" (UN-Habitat, 2011, p. 6).

Also, security of tenure is reflected on three levels: the *individual* (household or work place), the *settlement* and the *city* (UN, 2011, p. 15). The focus here is placed on indicators of individual tenure security and, more precisely, on indicators of *dwelling* (or housing) tenure security, which in any case are proxy indicators for land tenure (UN-Habitat, 2011, p.11).[37]

a) Indicators and standards

The proportion of households with access to secure tenure was MDG Indicator 32 (Target 11). It has been retained and expanded into SDG 1.4, Indicator 1.4.2: "the proportion of total adult population with secure tenure rights to land, with legally recognised documentation who perceive their rights to land as secure, by sex and by type of tenure". This is a Tier III indicator (UN, 2017b), i.e. the methodology and standard is being developed or tested. The indicator comprises several sub-indicators ("secure tenure rights", "legally recognised documentation", "perceive their rights to land as secure", "by gender") and remains vague in many ways. Essentially, it is neither completely clear when exactly tenure is considered secure nor which documentation is to be considered "legally recognised". A related indicator is 11.1.1, which measures the "proportion of urban population living in slums, informal settlements or inadequate housing".

UN-Habitat (2011) proposes a set of tenure indicators at the household level that reflect security of tenure as detailed in table 11. The first tracks the history and fear of eviction. Being evicted without due process of law is a manifestation of absolute insecurity of tenure. The second indicator includes the kind of document the household has for its dwelling or land. There is a tendency to over-claim ownership; a question on documentation helps to uncover if that is the case (UN-Habitat, 2011, p. 43). The third indicator covers the duration of residence. This is a proxy indicator for tenure security that is based on the assumption that the longer a household has lived in the dwelling or on the land, the greater the probability that its rights are recognised.

Most of the indicators listed table 11 can be constructed through the questions proposed in the Urban Inequities Survey (UIS) (UN-Habitat), detailed in table 12. However, UIS does not enquire about

[35] Tenure security of agricultural land promotes investment (IFAD, 2015).

[36] Sida (2007) and UN-Habitat (2011) emphasise the importance of security tenure beyond property rights; in fact, in developing countries not all "formal" types of tenure turned out to be secure, while not all the informal tenure was insecure.

[37] However, FAO, UN-Habitat and the World Bank have developed a module on land tenure, which is presented below.

the process through which the dwelling was acquired nor the length that the household has been living there. All documents except utility bills and property tax certificates are considered secure; yet, it is acknowledged that there is a wide margin for contextual adaptation (UN-Habitat, 2011, p. 17).

Table 11
UN-Habitat tenure indicators at the household level

Indicator	Definition
1. Evictions	
Family history of evictions	Number of households evicted in the last five years per 10,000
Household's risk perception	Percentage households heads who fear they will be evicted
Women's risk perception	Percentage women who fear they will be evicted from households after divorce/separation/loss of husband
2. Documentation and Acquisition	
Documents held:	Percentage families which hold: Titles Certificate of occupation Purchase agreement/receipt Property tax receipts Utility bills No documents
Process through which dwelling (and/or land) was acquired	Percentage of families acquiring land by: Formal finance sources (public or private) Direct purchase from private individuals/developers Self-arranged building (direct labouring or via a developer)
3. Duration of Residence/Use (of current dwelling/workplace)	
	Percentage households residing at current dwelling for 10+ years (proxy indicator for adverse possession). The same formula also holds for workplaces.
4. Rights	
Restrict	Percentage families believing they have the right to prevent others from entering
Develop	Percentage families believing they have the right to develop their dwelling
Sell	Percentage families believing they have the right to sell
Inherit	Percentage families believing they have the right to inherit

Source: UN-Habitat (2011, p. 35).

Table 11 presents an example of a possible a classification of the degrees of security of tenure according to the document held alongside the formality/informality of the tenure form. However, UN-Habitat also emphasises the importance of the perceptions of people regarding their security, as these affect the possibility "to live in peace and dignity" and behaviour towards the place they live. This is also influenced by the meso and macro levels of tenure noted by UN-Habitat: the physical and legal status of land at the settlement level and the legal and institutional framework at the city and national level.

In terms of the meso level, UN-Habitat considers insecure residential status as a defining characteristic of a slum (Villatoro, 2017a)[38] and recommends their identification and monitoring as a complement to the information about tenure at the household level (UN-Habitat, 2011).[39][40] For the macro level, UN-Habitat has developed the Legal and Institutional Framework Index (LIFI), an index constructed from qualitative data on evictions, remedial and preventive measures (UN-Habitat, 2006, 2009).

[38] The other characteristics are inadequate access to safe water, inadequate access to sanitation and infrastructure, poor structural quality of housing and overcrowding (https://unhabitat.org/urban-themes/housing-slum-upgrading/).

[39] Interestingly, there are some innovative initiatives for monitoring the emergence and growth of slums and settlements using satellite images and georeferenced datasets. See for example Jain, Sokhi and Sur, (2005) about India, Bayle (2016), and Kohli, Sliuzas and Stein (2016).

[40] There is significant variety of informal settlements, "from well-built communities that simply lack formal recognition, to very heterogeneous groupings of houses that are poorly planned and lack access to facilities such as roads and utilities" (p. x).

In this way, security of tenure can be assessed by combining micro-, meso- and macro-level indicators. For example, if there are eviction laws and practices that protect human rights (macro), community land is favourable (meso) and people do not fear evictions (micro), then the security of tenure is high (UN-Habitat, 2011, p. 37). But if the situation at one of the three levels is not favourable, then the security level is medium, and if all three fail, it is clearly low.

Table 12
Urban Inequities Survey (UIS) core tenure questions

1. Do you own or rent this unit (dwelling)?	
2. Do you have one of the documents below as evidence of your rights over this dwelling?[a]	**Owners:** Land registration certificate (s) Title deed to dwelling (s) Purchase agreement for land(s) Lease agreement for land (s) Certificate of occupation (s) Property tax certificate (i) Utility Bills (i) **Tenants:** Registered lease agreement (s) Non-registered lease agreement (s) Informal agreement (written) (s) Verbal agreement (written) (i) Occupied rent-free with knowledge of owner (i) Occupied rent-free without the knowledge of owner (i)
3. Does this document allow you to improve your dwelling?	Yes No
4. Does this document allow you to inherit or sell this dwelling?	Yes No
5. Does this document provide you with rights over land (full or shared rights)?	Yes No
6. (If yes) Right to develop on land?	Yes /No
7. Right to sell/inherit?	Yes /No
8. (If renter) Do you have a formal contract with landlord?	Yes /No
9. (If no) Have you sublet the dwelling you live in?	Yes /No
10. Have you heard of any forceful evictions in the city?	Yes No
11. (If yes) Do you trust you would be supported by the authorities if you are subject to forceful evictions?	Yes /No

Source: UN-Habitat (2011, p. 19).
[a] The kind of documents considered secured are marked with (s), and the ones considered insecure are marked with (i).

Using complementary information at different levels results in a more accurate assessment of tenure security, factoring in the effective risk of eviction (Villatoro, 2017a). It is also in line with Villatoro's (2017a) proposed exploratory tenure index. Such an index combines the indicator for insecure dwelling occupancy with whether (a) the dwelling is located in an illegal or informal settlement, (b) the dwelling is located in a precarious or deteriorated environment, or (c) the dwelling, such as a temporary or mobile home, is in a location not designed for human habitation. Deprivation is defined as the household is not an owner of the dwelling and (a) or (b) is true, or otherwise, (c) holds

Table 13
UN-Habitat (2011) tenure indicators combining document type and the formality/informality of the tenure form

Formal/Informal	Extent of security	Tenure categories
Formal		Dwelling owners holding titles
		Renters holding formal/written contracts
	Entirely secure	**Subtotal**
Informal		Dwelling owners w/certificates of occupation
		Dwelling owners w/private purchase agreements
	Semi-secure	**Subtotal**
		Dwelling owners with other documents
		Renters on private/verbal agreements
	Insecure	**Subtotal**
		Dwelling owners without any document
		Renters in alternative arrangements
		Renters without documents
		Squatters
	Strictly insecure	**Subtotal**
		Unknown
		Total

Source: UN-Habitat (2011, p. 47).

Motivated by the SDGs, FAO, UN-Habitat and the World Bank have developed (although not yet implemented) a *land* tenure module to monitor security of tenure.[41] This module allows for several additional indicators, such as form of acquisition/rent of the land, and it allows for gender disaggregation. The module could be shortened and adapted to dwelling/housing tenure, but this would not be fundamentally different from the LSMS questions detailed in table 15.

Tenure could not be included in the global MPI due to insufficient data availability. The regional MPI for Latin America (CEPAL, 2014), however, does include housing tenure; it considers households living in an illegally occupied house or in a ceded or borrowed house as deprived. El Salvador is the only country in Latin America so far that has included a tenure indicator in its national MPI. Vietnam includes an indicator that identifies as deprived households that "do not have a permanent house". Pakistan's MPI has a tenure indicator only for rural areas, but it covers land and livestock tenure. Bhutan also includes a land indicator, which is defined for rural households only ("household does not own more than one acre of land"). In turn, Eurostat has not included a tenure indicator to monitor the SDGs, although the EU-SILC enquires about forms of tenure.

b) Available data

Although one can see in table 9 that 83% of reviewed surveys contain information on housing tenure, with particularly high coverage in Latin America and Europe, such information is actually limited and difficult to compare. DHS does not enquire about housing tenure, although it asks about ownership of agricultural land and animals (specifying quantity). MICS has only three elementary questions, detailed in table 14, on ownership or renting.[42] Within the LSMS recommended modules (Grosh and Glewwe, 2000), the "dwelling expenditures" module included several questions on forms of tenure, which are detailed in table 15. The module asks about ownership or house-renting, documents, the holder/s of the document(s) and includes a number of detailed questions about the amount of rent or mortgage payments

[41] http://documents.worldbank.org/curated/en/812621505371556739/Land-tenure-module-essential-questions-for-data-collection-for-1-4-2-and-5-a-1.

[42] An additional point recently made by experts is that most health surveys use sampling frames taken from censuses and are unable to distinguish between slum and non-slum clusters in urban areas. Guidelines are being developed to address this issue ("Distinguishing slums from non-slum areas to identify occupants", 30-11-17, Bellagio, Italy, https://unhabitat.org/distinguishing-slum-from-non-slum-areas-to-identify-occupants-issues/).

when applicable. A subset of these questions would actually be sufficient for most of the indicators recommended by UN-Habitat (2011). However, these detailed questions from this module are rarely asked in household surveys.

Table 14
MICS questions on tenure

Do you or someone living in this household own this dwelling?	Yes No
(If No) Do you rent this dwelling from someone not living in this household?	Yes, rented from someone else Other responses (specify)
Does any member of this household own any land that can be used for agriculture?	Yes No

Source: Own elaboration.

Table 15
LSMS (2000) questions within the housing module on dwelling expenditures

1. Is this dwelling owned by a member of your household?	Yes No [go to 13]
2. How did your household obtain this dwelling?	Privatized Purchased from a private person Newly built Cooperative arrangement Swapped [go to 6] Inherited [go to 6] Other [go to 6]
3. How much did you pay for the unit?	Amount: Year:
4. If you make instalment payments for your dwelling, what is the amount of the instalment?	Write zero if the household does not make instalment payments Amount: Time Unit:
5. In what year do you expect to make your last instalment payment?	Year
6. Do you have legal title to the land or any document that shows ownership?	Yes No
7. Do you have legal title to the dwelling or any document that shows ownership?	Yes No
8. What type of title is it?	Full legal title Registered legal title Unregistered purchase receipt Other
9. Which household member(s) holds the title or document to this dwelling?	Write ID code of this person from the roster
10. Could you sell this dwelling if you wanted to?	Yes No
11. If you sold this dwelling today how much would you receive for it?	Amount
12. Estimate, please, the amount of money you could receive as rent if you let this dwelling to another person	Amount: Per time unit
13. Do you rent this dwelling for foods, services or cash?	Yes No [go to 26]
14. From whom do you rent this dwelling?	Relative Private employer State enterprise State Private person/agency Does not know
15. Does the owner live in the dwelling?	Yes No
16. How much does your household pay in cash to rent this dwelling?	If they do not pay, write zero. Amount Time Unit

Tabla 15 (concluded)

17. Does your household pay any of the rent using goods or services?	Yes: No [go to 19]
18. What is the approximate value of the goods and services paid by your household?	Amount: Per time unit:
19. Did you pay any deposit or up-front payment when you moved to this dwelling?	Yes No [go to 24]
20. How much was the deposit?	Amount

Table 15 (conclusion)

21. Will any of this deposit be returned?	Yes No
22. When will any of this deposit be returned?	Time unit
23. If any of this deposit will be returned, how much will the amount be?	Amount Time unit
24. Does your rent include any of the following?	Furniture Yes/No Electricity Yes/No Heating Yes/No Water Yes/No
25. How much would a unit like this sell for in today's market?	Amount

Source: Grosh and Glewwe (2000), vol. 3, ch. 12.
Time units: Day, week, fortnight, month quarter, half year, year.

Most typically, household surveys contain just one question — as is the case in Latin America — about the kind of tenure, with a varying range of alternative responses.[43] Villatoro (2017a) identifies some key weaknesses in the response categories of surveys in Latin America, namely:

a) many countries do not enquire about illegal occupation,
b) those that do ask most often do not record whether the dwelling is located in illegal or informal settlements, and
c) some categories do not record the kind of cession (e.g., "ceded", "rent-free occupation"),
d) "ceded by a relative" is a helpful category but is not always included, and
e) "ceded by employer" can entail varying degrees of tenure security.

The kind of document (if any) held is rarely asked, and thus there is no possibility of gaining further information on gender issues.

EU-SILC surveys ask some questions on tenure table 16 details the questions asked in the United Kingdom as an example. It includes a good range of questions on the form of tenure, but it does not ask about documents held or about who is the document holder. The survey in Spain includes some additional questions.

[43] One example of possible responses includes owner of dwelling and land, owner of dwelling only, tenant of dwelling, tax-payer occupant, occupant in dependent relationship, rent-free occupant (with permit), rent-free occupant (without permit), in inheritance process, other, and don't know (Argentina's Encuesta Permanente de Hogares, INDEC).

Table 16
EU-SILC questions on housing tenure

In which of these ways do you occupy this accommodation?	1 . Own it outright 2 . Buying it with the help of a mortgage or loan 3 . Pay part rent and part mortgage (shared ownership) 4 . Rent it 5 . Live here rent free (including on a relative's/friend's property; excluding squatting) [go to 2] 6 . Squatting	In which of these ways do you occupy this accommodation?
[If answer to question 5 is "yes"] Can I just check: Do you live rent free because all of your rent is paid through state benefits? (Only accommodation provided by someone else (employer, relative, etc.) is "rent free".	Yes [recode previous question answer as 4] No	[If answer to question 5 is "yes"] Can I just check: Do you live rent free because all of your rent is paid through state benefits? (Only accommodation provided by someone else (employer, relative, etc.) is "rent free".
[If buying as shared owner] Are you still buying your share in this [house/flat] or have you now paid off that mortgage or loan?	Still buying Mortgage is paid off	[If buying as shared owner] Are you still buying your share in this [house/flat] or have you now paid off that mortgage or loan?
Do you have a formal arrangement to let or sublet any part of this accommodation to someone who is NOT a member of your household?	Yes No	Do you have a formal arrangement to let or sublet any part of this accommodation to someone who is NOT a member of your household?
Who is that?	• Close relative • Other relative • Non-relative	Who is that?

Source: Own elaboration.

c) Discussion and recommendations

The importance of including security of tenure as an indicator of non-monetary poverty is increasingly accepted. While there has been a lot of progress towards the conceptualisation of security of tenure, there is no clear international benchmark of such security, and there is much to improve in terms of data collection.

A necessary starting point is the ownership question, for which the EU-SILC phrasing seems particularly convenient (In which of these ways do you occupy this accommodation?). A detailed set of response categories (Villatoro, 2017a), which should be decided with as much consensus as possible, is also required.

Second, it seems of outmost importance to also include a question on the type of document held (question 2 in UIS, table 12). This would allor the classification of tenure into categories of secure and non-secure (as in table 13) in a way that is more accurate than is currently possible. A question on duration of residence could also contribute to better identification of tenure security. A third step would be to enquire about name of the document holder in order to allow constructing gendered indicators. A fourth would be to include a question on the perception of tenure security, such as question 11 and, perhaps, question 10 in UIS (table 12), as complementary information related to the macro level. Finally, it is also desiable to register whether the dwelling is located in a n informal settlement (Villatoro, 217a), allowing meso-and micro level information to be combined.

While questions 3–9 of UIS (kinds of rights guaranteed) are also informative, they are perhaps of second-order importance. Much of that information might be inferred from the other recommended questions.

4. Durable goods

Durable goods are "items that last substantially longer than a year and are so large in relation to the household's standard of living that they can be separately enumerated and respondents can accurately remember information about their purchase after several years have gone" (Grosh and Glewwe, 2000, p.128). Durable goods do not have the broad international support as indicators of non-monetary poverty

that the other indicators considered here do, possibly because they have not been included in declarations and instruments of human rights or because they are expected to be highly correlated with permanent income (Villatoro, 2017a).

However, durable goods reflect – though with many limitations – access to Rawl's "primary goods" (namely rights, liberties and opportunities, income and wealth),[44] and satisfy many basic needs. From a capability approach perspective, durable goods enable *functionings* (with varying conversion rates across individuals) in multiple dimensions (Villatoro, 2017a; see also Sen, 2009 and Nussbaum, 2003). These functionings include mobility and communications (car, motorcycle, bike, phone), which in turn enhance work capacity and employability; better use of time (washing machine), which has gender aspects; health (a refrigerator preserves food); education and cognitive skills development (a computer, for example); and leisure (TV or radio), which can also affect productivity. Moreover, many durable goods are complements of some basic services, such as natural gas, water and sanitation.

Since Townsend (1979), there has been a longstanding tradition in Europe of including access to durable goods within the indicators of material deprivation.[45] Townsend's study was followed by another benchmark study: Mack and Lansley's (1985) *Poor Britain*, in which the list of items considered as necessities was constructed using a survey of the public's perceptions of minimum needs. The method has been referred to as the "consensual or perceived deprivation approach to measuring poverty", perhaps a pretentious name.[46] Another contribution from the survey was that it distinguished people who did not have an item because they could not afford it from those for whom it was a voluntary choice. The authors identified as poor those who could not afford three or more items from a list of 22, each equally weighted (p. 178). These studies inspired the structure of the European Community Household Panel Survey (EPCH) and its successor EU-SILC. Further work in this line includes Gordon et al. (2000), Callan, Nolan and Whelan (1993), Ringen (1987, 1988), Whelan et al. (2001) and Nolan and Whelan (2011).

One important question is whether an indicator of durable goods is used only as a *proxy* for income or living standard, or whether it is itself intrinsically valuable information. Empirical evidence from Europe suggests that non-monetary indicators of deprivation (including but not limited to durable goods) "supplement information about income, which is subject to mismeasurement and may not always be a reliable guide to 'permanent income'" and they can "help to capture the multidimensional nature of poverty and social exclusion" (Nolan and Whelan, 2011, p. 47).[47] Paroush (1963) argued that durable goods are acquired in a given order; thus, which durable goods a household has and which items it does not have would say something about its wealth. Deustch and Silber (2008) use this concept to construct a deprivation index.

a) Indicators and standards

There is no international standard for an indicator of durable goods per se. As stated above, access to (or the possibility to afford) durable goods has been included in measures of non-monetary poverty or material hardship for Europe, but alongside access to other items, such as those related to water, sanitation and housing conditions. In this European tradition, a counting-based poverty index is constructed, defining as poor people who fail to have or afford a certain number of items out of a total.[48] Specifically, since 2010, Eurostat reports the Material Deprivation Rate, in which material deprivation is defined as the enforced inability to afford three or more of nine items that most people consider to be necessary to lead

[44] Rawls (1999, p. 79). Of course, these are still just means to valuable ends (Sen, 2009).

[45] Townsend (1979) assessed the magnitude of relative deprivation in the United Kingdom (with data from 1968–69) using a list of 60 indicators covering 12 dimensions: diet, clothing, fuel and light, home amenities, housing conditions and facilities, the immediate environment of the home, conditions at work, family support, recreation, education, health and social relations. He then focused on a shorter list of 12 items covering major aspects of dietary, household, familial, recreational and social deprivation.

[46] The "consensus" reached with a survey using a pre-established list of items is somehow far from the ideal kind of deliberative consensus, which is built iteratively. Walker (1987) and Pichaud (1987) offer some critiques to the consensual approach.

[47] One widely used category in Europe is that of 'consistent poverty', which refers to people who are deprived in both non-monetary (but material) indicators of deprivation *and* income (Ringen, 1987, 1988).

[48] See chapter 4 in Alkire et al. (2015) for more details.

a satisfactory life, four of which are durable goods.[49] If people cannot afford four or more, they are considered to be "severely materially deprived". Severe material deprivation is one of the three indicators that define the Europe 2020 target population. More on this is found in section II.B. The severe material deprivation indicator is included in the MPI-EU by Alkire and Apablaza (2016).

The DHS Wealth Index also includes durable goods, but, again, alongside other indicators that belong to the other dimensions considered here (water, sanitation, housing materials, energy, land ownership, etc.).

The global MPI (UNDP, 2010; Alkire and Santos, 2010, 2014) used an *ad-hoc* indicator of durable goods that defined as deprived households that did not have one big durable good, namely a car or truck, or at least two small durable goods, namely, a radio, TV, telephone, bicycle, motorbike or refrigerator.[50] Bhutan, Nepal and South Africa use the same indicator; Pakistan uses a similar one, with a longer list of assets. Bhutan also includes a livestock indicator, which identifies as deprived households that do not own more than three of these items: cattle, horses, sheep, goats, chickens, pigs, buffalos or yaks. Mozambique's indicator requires a household to have at least three of the following: bicycle, car, motorbike, TV, radio, phone, computer, printer, bed, refrigerator or freezer. Malaysia's MPI has three *separate* access indicators: one for car or motorcycle; refrigerator, another for electric or kerosene or wood/charcoal stove; and a third for radio, TV, fixed line phone or mobile phone, and PC/laptop or internet. Vietnam's MPI includes one indicator for access to TV, another on access to motorbike and another on access to telephone. The MPI-LA's durable goods indicator defines a household as deprived if it does not own at least one of: car, refrigerator and washing machine. The Arab MPI identifies acute deprivation if households have either no access to information or no access to easy mobility and livelihoods assets, and deprivation if households have less than two assets for accessing information or less than two mobility and less than two livelihoods assets.

Thus, while there is no international norm, there are some durable goods that appear consistently across indicators and surveys, namely car, motorbike, bicycle, phone[51] and TV. These goods appear in DHS, MICS, LSMS's recommended consumption module (Grosh and Glewwe, 2000) and EU-SILC. DHS and MICS additionally always include refrigerator and radio (as well as a watch), whereas EU-SILC includes computer and washing machine.[52]

b) Available data

The LSMS recommended consumption module includes a sub-module on durable goods, detailedim table 17. While this may be too detailed for the purpose of assessing multidimensional poverty, it is interesting that questions include when the item was acquired and at how much could it be sold, which are indirect measures of the quality of the durable good.

[49] The nine items are (1) coping with unexpected expenses; (2) one week's annual holiday away from home; (3) avoiding arrears (in mortgage or rent, utility bills or hire purchase instalments); (4) a meal with meat, chicken, fish or vegetarian equivalent every second day; (5) keeping the home adequately warm; (6) a washing machine; (7) a colour TV; (8) a telephone; and (9) a personal car. This list is based on Guio et al. (2009). Guio, Gordon and Marlier (2012) proposed a revised list of 13 indicators, which excludes washing machine, colour TV, telephone and includes a computer and internet connection and "to replace worn-out furniture". The reason to exclude those three durable goods was that they were redundant with an indicator of subjective poverty and an indicator of income poverty.

[50] The list of included durable goods was guided by data availability for the 100+ countries for which the global MPI was computed for the first time.

[51] Some surveys ask about both landline and mobile phones.

[52] A computer is considered to be among the items that can be added to the list. DHS suggests that each country adds at least five items of furniture and at least four household appliances so that the list includes at least three items that even a poor household may have, at least three items that a middle-income household may have, and at least three items that a high-income household may have.

Table 17
LSMS recommended durable goods sub-module

Does your household own any of the following items?	Yes/No
Stove	
Refrigerator	
Washing machine	
Sewing/knitting machine	
Fan	
Television	
Video player	
Tape player/CD player	
Camera	
Video camera	
Bicycle	
Motorcycle/scooter	
How many years ago did you acquire this [item]?	
Did you purchase it or receive it as a gift or payment for services?	
How much did you pay for it?	
How much was it worth when you received it?	
If you wanted to sell this [item] today, how much would you receive?	

Source: Own elaboration.

However, actual implementation of LSMS surveys varies. In Latin America most countries ask about a variety of durable goods including car, washing machine and refrigerator (Villatoro, 2017a).

DHS and MICS questions on durable goods, detailed in table 18, have several items in common with LSMS, but also some differences, such as including an animal-drawn cart and a boat. Also note that in MICS a question on having a stove is included in the section on energy (see section I, B, 2, b).

Table 18
DHS and MICS questions on durable goods

Does your household have:	
Electricity*	Yes/No
A radio	
A television?	
A mobile telephone?	
A non-mobile telephone?	
A refrigerator?	
Does any member of this household own:	Yes/No
A watch?	
A bicycle?	
A motorcycle or motor scooter?	
An animal-drawn cart?	
A car or truck?	
A boat with a motor?	

Source: Own elaboration.
*Electricity is placed here in DHS, but it is with the energy questions in MICS.

DHS also asks about ownership of agricultural land and livestock, but those are actually assets not durable goods. The issue of land ownership has already been discussed table 17 lists EU-SILC questions on durable goods.

Table 9 indicates that 82% of the reviewed surveys include information on assets, with particularly high coverage among European and Latin American countries. However, as detailed above, comparability is far from perfect (i.e. included items differ).

Table 19
EU-SILC questions on durable goods

Does your household have a	
Personal computer	Yes/No
Car	
Telephone (including mobile)	
Colour TV	
Washing machine	
[If No] You said your household doesn't have a [item]. That is because you....	
1. Don't want one	
2. Would like one but cannot afford it?	
3. Or is there some other reason?	

Source: Own elaboration.

c) Discussion and recommendations

Including a few key questions on access to the core set of durable goods seems relevant because of their links to multiple functionings, the evidence from Europe of valuable complementary information and the antecedents of several national MPIs include such an indicator. Based on previous experience, it seems that the following items should be included: car, motorbike, bicycle, telephone, TV, refrigerator, washing machine and computer. It is also important to include a question on cookstoves but this is better asked within the questions on energy (section I.B.2.b).

While attractive, the European tradition of registering *enforced* lack of an item has conceptual and practical drawbacks.[53] Conceptually, if the items included in the list have emerged as being necessary for minimum current living standards, according to the capability approach, one may argue that households "have reason to value" them, regardless of their preferences. Second, psychological research has documented systematic errors and cognitive bias in retrospective evaluations of experienced utility, which casts doubts on reported preferences (Kahneman, Walker and Sarin, 1997), which casts doubts on opinions as indicators of preferences. There are also practical problems such as the reality that the reason given by the respondent (typically the household head) for lacking an item may not coincide with the perceptions of other members. More generally, "the 'rich' rarely choose to live like the 'poor' and the choices the 'poor' can make are generally constrained" (Gordon and Pantazis, 1997, p.13). It is noteworthy that, if these indicators are integrated into an MPI using an intermediate poverty cutoff, the rare cases in which an individual or household lacks an item by choice (presumably not poverty related) are ignored by censoring the deprivations of the non-poor

B. Basic services

1. Water, sanitation and hygiene (WASH)

Access to safe water and sanitation is now a globally accepted human right with multiple well-studied health benefits. In fact, these indicators are frequently placed within the health dimension in many of the considered MPIs.

The human right to water entitles everyone to *sufficient*, *safe*, *acceptable*, *physically accessible* and *affordable* water for personal and domestic use; the human right to sanitation entitles everyone to sanitation services that provide privacy and ensure *dignity*, and that are *physically accessible*, *affordable*, *safe*, *hygienic*, *secure*, and *socially and culturally acceptable* (UN-Habitat, 2014c).

JMP is the Joint Monitoring Programme for Water Supply, Sanitation and Hygiene, established by WHO and UNICEF in 1990, which has been in charge of defining indicators and monitoring progress

[53] Khassanov and Khassanova (2017) recommend incorporating questions on enforced lack of durable goods in UNECE countries where EU-SILC is not performed.

towards the MDGs and, now, towards the SDGs.[54] WASH-related indicators are Tier I SDG indicators (UN, 2017b).

a) Indicators and standards

Goal 1.4 states "By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services...." Indicator 1.4.1 is the "proportion of population living in households with *access* to basic services". This indicator is closely related to Goal 6.1 ("Achieve universal and equitable access to safe and affordable drinking water for all") for which Indicator 6.1.1 is the "proportion of population using *safely managed* drinking water services". It is also linked to Goal 6.2 ("Achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations") for which Indicator 6.2.1 is the "proportion of population using *safely managed* sanitation services, including hand-washing facility with soap and water". These two goals and their corresponding indicators replace Target 10 of MDG 7: "Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation", the indicators for which were the "proportion of population with sustainable access to an improved water source, urban and rural" and the "proportion of population with access to improved sanitation, urban and rural".

With the MDGs, the focus was on discriminating between improved and non-improved water and sanitation, understanding improved sources as proxies of safety. SDGs 6.1 and 6.2 are substantially more ambitious than the previous MDG targets (WHO-UNICEF, 2017a): (1) they require eliminating inequalities in service levels, (2) they include hygiene, (3) they specify that drinking water should be safe and affordable, and that sanitation should be adequate, (4) they include explicit references to ending open defecation and to the needs of women, girls and those in vulnerable situations. In this way, the SDGs have "raised the bar" and intend to better address the human right to water and sanitation criteria, including accessibility, availability and quality (WHO-UNICEF, 2017a).

In response to the SDGs, the JMP defined a "service ladder" that builds on the established improved versus unimproved facility type classification (with some adjustments), providing continuity with MDG monitoring and introducing additional criteria relating to the level of service provided to households (WHO-UNICEF, 2017a, p. 7).

The JMP water service ladder

Like the MDGs, the departure point for the JMP water service ladder (figure 2) is classifying water sources into improved and unimproved – with one modification. Improved sources are "those that are potentially capable of delivering safe water by nature of their design and construction". These include:

- Piped water (tap water in dwelling, yard or plot; or public standposts),
- Boreholes or tube wells,
- Protected dug wells,
- Protected springs,
- Bottled water, tanker truck, vendor provision,
- Rainwater.

The asterisks are to signal the following clarifications. JMP declares that bottled water and tanker trucks "can potentially deliver safe water", but during the MDG years, these were considered unimproved due to lack of data on accessibility, availability and quality. With the SDGs JMP has started to consider them as improved and classify them as "limited", "basic" or "safely managed" based on the criteria

[54] SDG 6 coverage includes schools, health care facilities and work places, but indicators for institutional frameworks exceed the scope of this study.

mentioned in figure 2.[55] In turn, although rainwater is classified as protected in all JMP reports, this seems a bit risky. While it is true that rainwater is potentially safe water, the additional characteristics that ensure that it is actually safe are not easy to check. Its sufficient availability, which depends upon climate conditions, seems substantially more fragile than the other improved sources. Also, surveys do not enquire about the way in which it is stored, which can critically affect its safety. A conservative view of including rainwater among the unimproved sources might be safer. JMP unimproved sources are (1) unprotected dug wells and (2) unprotected springs (to which rainwater could be added).

As can be seen from figure 2, SDG1.4.1 is what JMP now calls "basic service". This corresponds to the definition used during the MDG years: water comes from an improved water source *and* that it must be within a 30-minute walk, round trip (including queuing). If the source is improved but water collection exceeds a 30- minute walk, round trip, then it is now classified as "limited service".

For water service to be classified as "safely managed" (SDG 6.1), it needs to be from an improved water source *and* meet three additional criteria: (1) be accessible on premises, (2) be available when needed and (3) be free from contamination.

Data to check compliance with requirements (2) and (3) is not typically available from censuses or household surveys. Thus JMP uses administrative sources, including regulators, to assess availability and compliance with drinking water standards. However, surveys are starting to collect data on the availability and quality of water at the household level, even testing drinking water for contamination. But there is a long way to go on this matter (Terán, 2017).

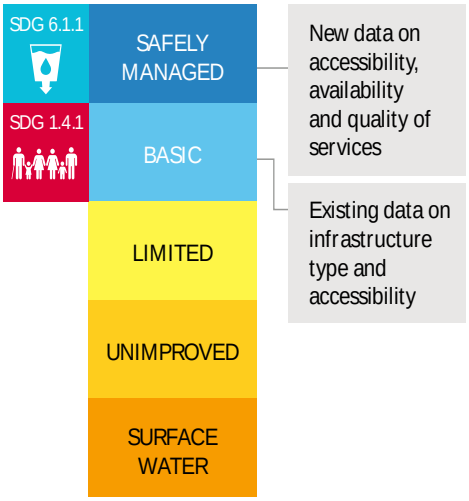
The JMP water service ladder is a significant advance in setting an international standard with a neat ordering of types of water service. The highly cited WHO paper by Howard and Bartram (2003) states that public health gains derived from the use of increased volumes of water typically occur in two major stages. The first stage occurs when the lack of basic access is overcome, eliminating excessive water collection times that result in inadequate amounts of water for hygiene and consumption. The second stage happens when water becomes available at the household level.[56] Thus, providing a basic level of access is the highest priority for the water and health sectors.

The global MPI used the basic service level standard, which was the norm in the MDG years, applying it to both urban and rural areas. Bhutan, Nepal and Pakistan's national MPIs, as well as the Arab MPI, also follow the MDG standards. Rural areas obviously present a challenge in terms of provision of water and sanitation services, "particularly where there are large distances between households or where water is scarce" (UN-Habitat, 2014c, p. 42). It is common to set different minimum standards for urban and rural areas (Villatoro, 2017a). For example, in urban areas, CEPAL (2014) required piped water within the premises in order to be non-deprived; whereas for rural areas it required access to piped water, even if it was not within the household premises. In other words, while in rural areas a "basic service" level was required, while in urban areas the minimum requirement was closer to the "safely managed service" level. This seems a reasonable norm, but it requires an accurate classification of water sources into improved and unimproved, which in turn requires surveys to provide unambiguous response categories.

[55] JMP declares this change regarding packaged water has only a minor impact on global statistics, because JMP previously counted bottled water as improved when the source of water used for other purposes was improved, which was nearly always the case. However, the reclassification has a significant impact on estimates in a number of countries where it is common for people to drink water delivered by tanker trucks. For SDG monitoring, JMP will classify households using tanker trucks with collection times of 30 minutes or less as having at least basic services (WHO-UNICEF, 2017a, p. 18).

[56] Additionally, Howard and Bartram (2003) highlight that there are other gains associated with better water service, such as increased time for activities such as childcare, food preparation and productive activity (including education).

Figure 2
JMP water service ladder



SERVICE LEVEL	DEFINITION
SAFELY MANAGED	Drinking water from an improved water source that is located on premises, available when needed and free from faecal and priority chemical contamination
BASIC	Drinking water from an improved source, provided collection time is not more than 30 minutes for a round trip, including queuing
LIMITED	Drinking water from an improved source for which collection time exceeds 30 minutes for a round trip, including queuing
UNIMPROVED	Drinking water from an unprotected dug well or unprotected spring
SURFACE WATER	Drinking water directly from a river, dam, lake, pond, stream, canal or irrigation canal

Note: Improved sources include: piped water, boreholes or tubewells, protected dug wells, protected springs, rainwater, and packaged or delivered water.

Source: WHO-UNICEF (2017a), pp. 2 and 8.

The national MPIs in Latin America available so far, as well as the MPIs in Armenia, Moldova, South Africa and Malaysia, are more demanding than the global MPI and sometimes also more demanding than CEPAL (2014). Honduras, Colombia and Chile implement a criterion similar to CEPAL (2014). However, other countries require piped water in the dwelling, regardless of the area (as is the case for Costa Rica, Ecuador, Mexico, Armenia and Moldova). Finally, Panama, El Salvador and Dominican Republic not only require piped water in the dwelling but also that there is sufficient availability (requirements vary). Armenia requires access to centralised water every day of the month and every hour of the day.

JMP sanitation service ladder

Again, the departure point for the JMP sanitation service ladder (Figure 3) is classifying sanitation facilities into improved and unimproved, as was done with the MDGs. Improved sanitation facilities are "those designed to hygienically separate excreta from human contact". These include:

- **wet sanitation technologies:** flush and pour flush toilets connecting to sewers, septic tanks or pit latrines;
- **dry sanitation technologies:** ventilated improved pit latrines; pit latrines with slabs; or composting toilet.

Improved facilities shared with other households have previously been reported separately and did not count towards the MDG target. JMP will now consider shared improved facilities as *limited* service (analogous to the case of over 30 minutes' distance to water), which is above the "unimproved" level but below what it is considered "basic".

Analogous to the case of water, basic service corresponds to SDG 1.4.1 and it is the equivalent to the MDG standard. JMP considers the sanitation service to be "safely managed" when the excreta produced is:

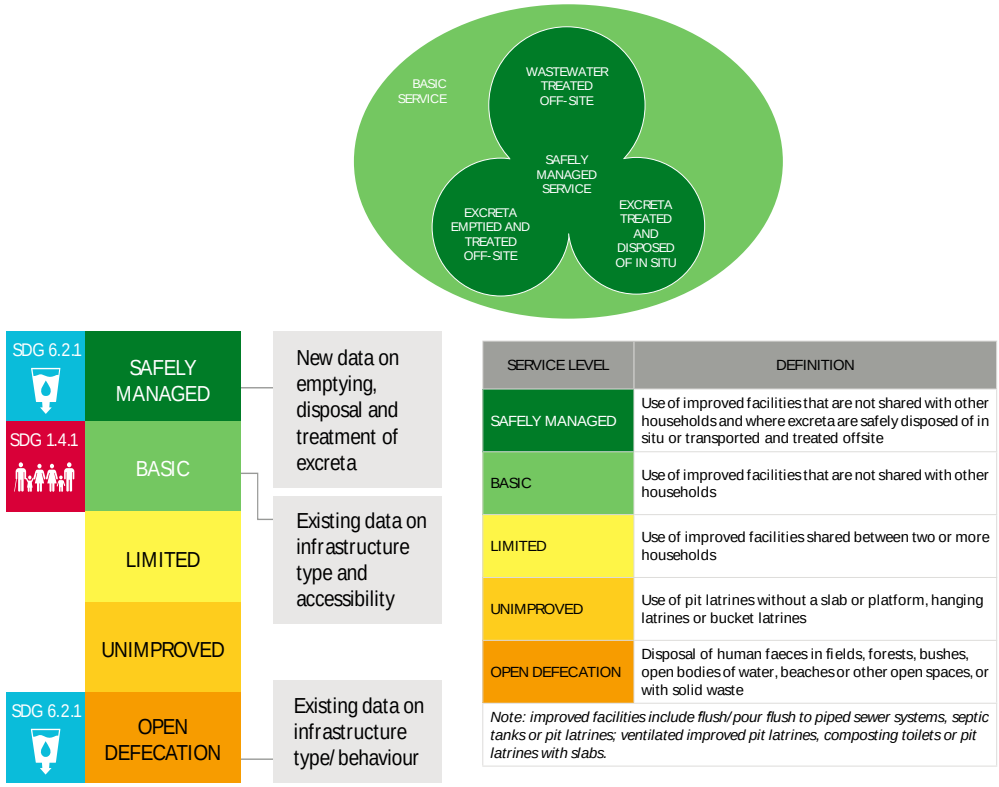
- treated and disposed of in situ (such as septic tanks or latrine pits);
- stored temporarily and then emptied, transported and treated off-site; or
- transported through a sewer with wastewater and then treated off-site.

The global MPI follows the MDG standards equivalent to "basic service" (non-shared improved sanitation facility) (regardless of whether the area is urban or rural) and so do the MPIs in Bhutan, Pakistan, Nepal, Vietnam and the Arab MPI. The regional MPI for Latin America (CEPAL, 2014) uses a more demanding criterion, which includes the treatment of excreta and is closer to the definition of "safely managed" sanitation services. For urban areas it requires the toilet or latrine *to be connected to piped sewer system or septic tank* in order to be non-deprived; for rural areas it only requires some form of excreta treatment (but includes pit without septic tank). National MPIs in Latin America require safely managed sanitation services both in urban and rural areas, so do the MPIs in Moldova, South Africa and Malaysia (these last two require a flush toilet).[57]

In developed countries, including Australia, New Zealand and those in North America and Europe, are very close to achieving universal basic drinking water services (WHO-UNICEF, 2017, p. 11). Among the indicators to monitor the first SDG Eurostat (2017) has the "share of total population having neither a bath, nor a shower, nor indoor flushing toilet in their household". This indicator implicitly requires having access to piped water in a dwelling in sufficient quantity (for shower and bath), and explicitly requires a flush toilet. Additionally, Eurostat also has indicators to monitor SDG 6, which are "population connected to urban wastewater treatment with at least secondary treatment", "nitrate in groundwater" and "bathing water quality" (Eurostat, 2017). In other words, information for these countries is in line with measuring water service at the "safely managed" level, taking the basic service for granted.

[57] The exception is Colombia, which, like CEPAL (2014), includes pit without septic tank in rural areas.

Figure 3
The JMP sanitation service ladder



SERVICE LEVEL	DEFINITION
SAFELY MANAGED	Use of improved facilities that are not shared with other households and where excreta are safely disposed of in situ or transported and treated offsite
BASIC	Use of improved facilities that are not shared with other households
LIMITED	Use of improved facilities shared between two or more households
UNIMPROVED	Use of pit latrines without a slab or platform, hanging latrines or bucket latrines
OPEN DEFECATION	Disposal of human faeces in fields, forests, bushes, open bodies of water, beaches or other open spaces, or with solid waste

Note: improved facilities include flush/pour flush to piped sewer systems, septic tanks or pit latrines; ventilated improved pit latrines, composting toilets or pit latrines with slabs.

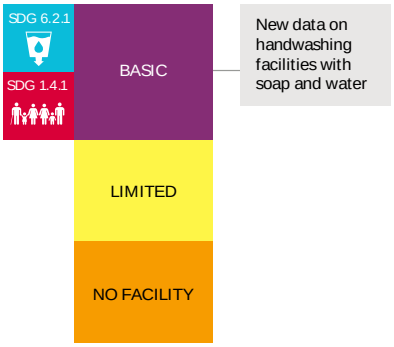
Source: WHO-UNICEF (2017a), pp. 2 and 8.

JMP hygiene service ladder

JMP considers hygiene as part of SDG 1.4.1. Explicitly including hygiene in SDG 6 is a big step forward (WHO-UNICEF, 2017a). "To gain the full benefits in public health and dignity of improved access to water and sanitation services, people must practice good hygiene behaviour, particularly hand-washing at critical moments" (UN-Habitat, 2014c, p. 22; see also Howard and Bartram, 2003). While hygiene can comprise much behaviour, experts have identified handwashing with soap and water as a top priority in all settings, as well as a suitable monitoring indicator (JMP, 2017b, p. 18).

In terms of handwashing facilities, JMP considers not only a sink with tap water but also "other devices that contain, transport or regulate the of flow water", which includes buckets with taps, tippy-taps and portable basins, bar soap, liquid soap, powder detergent and soapy water (JMP, 2017a, p.18). For the hygiene service to be considered basic there needs to be a handwashing facility with soap and water available on premises (Figure 4). If there is a handwashing facility but a lack of water and/or soap, it is classified as having limited hygiene access.

Figure 4
JMP hygiene service Ladder



SERVICE LEVEL	DEFINITION
BASIC	Availability of a handwashing facility on premises with soap and water
LIMITED	Availability of a handwashing facility on premises without soap and water
NO FACILITY	No handwashing facility on premises

Note: Handwashing facilities may be fixed or mobile and include a sink with tap water, buckets with taps, tippy-taps, and jugs or basins designated for handwashing. Soap includes bar soap, liquid soap, powder detergent, and soapy water but does not include ash, soil, sand or other handwashing agents.

b) Available data

1. Improved vs. non-improved water source

The DHS and MICS set of response categories is the more exhaustive and accurate as detailed in table 19. These categories allow defining easily whether the water source is improved or not. Moreover, this question is asked for the source of drinking water and another question with the same response categories is asked about the source of water for other purposes (such as cooking and hand washing).

In contrast, LSMS questionnaires vary quite significantly and often include ambiguous categories for which it is not clear whether it is improved or not (Villatoro, 2017a), for example: "private well" or "spring" (unclear whether it is protected or not). This is a critical limitation, as it does not allow assessing the very first basic discrimination into improved and non-improved water sources. Similarly, some surveys do no discriminate whether piped water is within premises,[58] which does not allow defining whether the service can be classified into the "safely managed" category. These inconsistencies across surveys need to be amended as soon as possible.

In terms of water uses, the LSMS reference housing module (Grosh and Glewwe, 2000, vol. 3), asks one question about the main source of water for "drinking and cooking", and another one for the main source of water for "bathing and washing"; this differs from DHS and MICS which separate drinking from other water uses. However, actual implementations of the questionnaire vary greatly across countries. In Latin America, the question typically refers to water for domestic use in general (Villatoro, 2017a, p. 29). Additionally, in certain countries, the LSMS reference questionnaire, DHS and MICS have water questions for the rainy season and for the dry season.

Table 23 shows that about 40% of reviewed surveys have a question either on the main source of drinking water or water in general (this includes a connection to a public network), but the proportion is 73% if one excludes EU-SILC surveys. EU-SILC asks about an indoor bath or shower (which implies access to piped water anyway).

[58] For example, Brazil, Colombia, Ecuador and Guatemala regular household surveys between 2000 and 2014 (Villatoro, 2017).

Table 20
DHS and MICS water source response categories

Piped water
Piped into dwelling
Piped into yard/plot
Public tap/standpipe
Tube well or borehole
Dug well
Protected well
Unprotected well
Water from spring
Protected spring
Unprotected spring
Rainwater
Tanker truck
Cart with small tank
Surface water (river, dam, lake, pond, stream, canal, irrigation channel)
Bottled water
Other

Source: Own elaboration.

2. Accessibility of water (distance, time to water)

In cases in which the water source is not located in the dwelling or yard, DHS and MICS ask about distance to water,[59] information that is absolutely necessary to assess access to basic service. LSMS reference questionnaires (Grosh and Glewwe, 2000) also include a question on distance to the water source, but in practice this question is not commonly included – at least not in Latin America (Villatoro, 2017a).

DHS and MICS additionally ask *who* usually goes to fetch water, which is a key piece of information for intra-household distribution of chores, time use and gender studies. This is related to the *acceptability* aspect of the service, commented on below.[60]

3. Availability of water (quantity)

WHO considers that between 50 and 100 litres of water per person per day (l/c/d) are needed to ensure that most basic needs are met and few health concerns arise.[61] Howard and Bartram (2003) consider 50 l/c/d as an "intermediate level", whereas 100 l/c/d or more is the optimal access. WHO-UNICEF (2000), WELL (1998) and Carter et al. (1997) propose 20 l/c/d as a minimum criterion for water supply, classified as "basic level service" by Howard and Bartram (2003).[62]

Rather than directly measuring the quantity of water delivered, JMP "focuses on the *amount of time* when water is available" (JMP, 2017a, p. 26). DHS Phase 7 (2013–2018) and MICS Round 6 include a question to capture availability: "In the past two weeks was the water from this source not available for at least one full day?" (DHS); "In the last month, has there been any time when your household did not have sufficient quantities of drinking water?" (MICS). Some surveys in Latin America (Mexico, El Salvador, Guatemala, Honduras, Nicaragua and Paraguay) ask similar questions (Villatoro, 2017a).

[59] "How long does it take to go there, get water, and come back?"
[60] Evidence indicates that women and girls typically have the burden of collecting water when water is off premises (WHO-UNICEF, 2017a, p.11).
[61] See OHCHR, UN-HABITAT, WHO (2010), Gleick (1996) and Villatoro (2017a).
[62] Lower thresholds have been proposed for specific circumstances such as disaster relief (Sphere, 2017b).

JMP additionally uses complementary information from regulators and utilities, and uses 12 hours per day as the global minimum benchmark for "available when needed". Interestingly, Howard and Bartram highlighted that "evidence suggests that the volume of water used in the home is sensitive only to gross differences in service level" (2003, p. 19). Thus, the first priority is to ensure basic level access (WELL, 1998).

In terms of availability, UN-Habitat (2014) calls attention to four challenges. First, the availability of these services should be independent of tenure status in the legal framework. Second, water for domestic use as well as subsistence farming should be prioritised and guaranteed by law. Third, public drinking water and sanitation facilities should free of charge to guarantee a minimum of accessibility. Fourth, services should be provided through technologies that can be maintained locally.

4. Quality of water

Water must be free from micro-organisms, chemical substances and radiological hazards that constitute a threat to a person's health.[63] Satisfying this requirement in addition to the above is what makes water service "safely managed". Verifying the water quality requires the recommended E.coli test (WHO-UNICEF, 2017a), which has been included in MICS Round 6 for a subsample of randomly selected households. This has not yet been extended to DHS or LSMS.[64] JMP uses information from administrative sources, including regulators, to assess water availability and compliance with drinking water standards.

DHS, MICS and also some LSMS include questions on whether the household does anything to make the water safer to drink; the options are: boil, add bleach/chlorine, strain through a cloth, use water filter, solar disinfection, and let it stand and settle.

5. Improved vs. unimproved toilet facility

Household surveys typically collect information on sanitation systems, but the level of detail varies greatly and it is not always possible to determine whether the service is safely managed. In some cases it is not even possible to accurately determine whether the sanitation facility is improved or not. The DHS and MICS ask "What kind of toilet facility do members of your household usually use?" and offer the response categories detailed in table 21 which condenses the kind of toilet facility with the system of excreta disposal.

Table 21
DHS and MICS toilet facility response categories

Flush or pour flush toilet
Flush to piped sewer system
Flush to sceptic tank
Flush to pit latrine
Flush to somewhere else
Flush, don't know where
Pit latrine
Ventilated improved pit latrine
Pit latrine with slab
Pit latrine without slab/open pit
Composting toilet
Bucket toilet
Hanging toilet/Hanging latrine
No facility/bush/field
Other

Source: Own elaboration.

[63] OHCHR, UN-HABITAT, WHO (2010).
[64] See the "Water Quality Testing Questionnaire" in MICS surveys. Also see Teran (2017).

Additionally, DHS and MICS ask *where* the toilet facility is located (on premises or not) and whether it is *shared* with other households (and with how many). For those replying "flush to septic tank" MICS additionally asks whether the septic tank has ever been emptied and where was it emptied the last time. In other words, these questions cover issues of *accessibility* and *quality* of the sanitation service.

LSMS tends to separate the question about the kind of toilet from the type of excreta disposal. Most typically, there is a question that reads: "What is the type of toilet used in your household?", and the response categories are flush toilet, traditional latrine, ventilated improved latrine, bowl/bucket, other/specify, and no toilet. LSMS then asks "What disposal system is this toilet connected to?", and the response categories are sewer system, septic tank, none/discharges to surface groundwater.[65] Additionally, there is a question on whether the toilet facility is shared with other households or not.

In practice however, the implementations have variations. For example, among surveys in 17 Latin American countries, while all ask whether the household has a toilet or not, only half of them include the question on whether the toilet facility is shared. Further, only a few ask whether the toilet facility is in the respondent's own dwelling or yard/plot or elsewhere else, or ask about the specific toilet facility (flush toilet, ventilated latrine, etc.) (Villatoro, 2017a, pp. 35–37). Table 23 also shows the heterogeneity in sanitation questions across different country surveys, offering a quite fragmented picture and making proper cross-country comparisons difficult.

JMP highlights that it is important to distinguish between sewered (predominant in urban areas) and non-sewered sanitation facilities (predominant in rural areas). A key point is that "septic tanks" and "pit latrines" cover in practice many kinds of on-site storage systems that may not necessarily have all the safety features. While JMP treats all these systems as "safely managed", it reports them separately (JMP, 2017a, p.16).

JMP emphasises that the typical questions on excreta management actually provide no information about the amount of excreta lost in transport, the amount that bypasses treatment plants or the amount that is discharged without treatment. Data on excreta management in on-site systems is also limited. JMP complements survey data with information from national authorities including ministries, regulators and statistical offices. But again, the fact that there is treatment technology installed does not guarantee that management is actually safe.

6. Access to basic hygiene

Questions the on availability of handwashing facilities with soap are being incorporated into recent household surveys (DHS Phase 6 onwards; MICS 4 onwards). These require the surveyor to observe and record the presence of handwashing materials (table 22).[66] Materials other than soap (ash, soil, sand) are counted as limited handwashing facilities (these are less effective agents than soap) (JMP, 2017a, p.18). LSMS-type of surveys have not yet incorporated these questions.

7. Affordability of water and sanitation

Payment for services should not present a barrier to access – or prevent people from meeting other basic human needs. There is as of yet no consensus on how to measure the affordability of basic services, but a benchmark that water costs should not exceed 3% of household income has been used by UNDP, governments and other international agencies (JMP, 2017a).[67] However, expenditure surveys may not coincide with surveys that adequately capture other non-monetary poverty indicators, as is most often the case in Latin America, where household surveys only collect information on income.

8. Acceptability of water and sanitation

"Water should be of an acceptable colour, odour and taste for each personal or domestic use, and all water facilities and services must be culturally appropriate and sensitive to gender, lifecycle and privacy requirements" (WHO, 2015). While JMP does not explicitly discuss this requirement, it is worth noting

[65] Grosh and Glewwe (2000), vol. 3.

[66] It is considered that this is a more reliable proxy for handwashing behaviour than asking individuals whether they wash their hands (WHO-UNICEF, 2017a, p. 18).

[67] OHCHR, UN-HABITAT, WHO (2010).

that the requirement of having a toilet facility that is not shared with other households, the kind of facilities defined as improved, and the requirement of the use of soap for hygiene are norms that are intended to guarantee acceptability.

Table 22
Hygiene module implemented in DHS and MICS

DHS and MICS questions	
We would like to learn about the places that households use to wash their hands Can you please show me where members of your household most often wash their hands?	Observed Fixed facility observed (sink/tap) In dwelling In yard/plot Mobile object observed (bucket/jug/kettle)
Record result and observation	Not observed No handwashing place in dwelling/yard plot No permission to see Other reason (specify)
Observe the presence of water at the place for handwashing Verify by checking the tap/pump, or basin, bucket, water container or similar objects for presence of water	Water is available Water is not available
Is soap or detergent or ash/mud/sand present at the place for handwashing?	Yes, present. No, not present
Record your observation	Bar soap Detergent (powder/liquid/paste) Liquid soap Ash/mud/sand
Do you have any soap or detergent or ash/mud/sand in your house for washing hands? Can you please show it to me?	Yes/No
Record your observation	Bar soap Detergent (powder/liquid/paste) Liquid soap Ash/mud/sand

Source: Own elaboration.

Table 23
Data availability on non-monetary poverty indicators, part II – basic services indicators
number of surveys considered with available information
(Percentages are over total number of surveys considered in each region)

Region	Main source of Drinking Water	Main Source of Water in General	DW or GW	Bath or shower indoor	Type of Sewage	Has toilet (Y/N)	Kind of Toilet Facility	Indoor flush toilet	Shared toilet	Type of cooking fuel	Type of energy for Lighting	Ability to keep house warm	Garbage Collection[a]
East Asia & Pacific	59 (75%)	40 (51%)	59 (75%)	NA	11 (14%)	NA	52 (67%)	NA	NE	37 (47%)	49 (63%)	NA	12 (15%)
Europe & Central Asia	20 (5%)	20 (5%)	20 (5%)	384 (100%)	4 |(1%)	NA	17 (4%)	384 (100%)	NE	8 (2%)	20 (5%)	384 (95%)	4 (1%)
Latin America & Caribbean	110 (45%)	156 (64%)	212 (86%)	NA	198 (80%)	245 (100%)	89 (36%)	NA	94 (38%)	193 (79%)	188 (76%)	NA	149 (61%)
Middle East and North Asia	80 (57%)	27 (21%)	81 (43%)	10 (100%)	38 (29%)	NA	40 (31%)	10 (10%)	25 (21%)	42 (33%)	45 (36%)	NA	26 (19%)
South Asia	27 (100%)	21 (77%)	27 (100%)	NA	6 (22%)	NA	24 (89%)	NA	NE	24 (89%)	27 (100%)	NA	6 (22%)
Total	**296 (33%)**	**264 (30%)**	**399 (42%)**	**394 (41%)**	**257 (29%)**		**222 (25%)**		**155 (17%)**	**304 (34%)**	**329 (37%)**		**197 (22%)[b]**

Source: Own elaboration based on DAPI.
[a] Refers either to the question on the way in which the household disposes of solid waste or the yes/no question on whether the household is reached by the solid waste collection system.
[b] This proportion is over a total of 886 surveys for which the availability of this specific question was checked (out of the total of 940)

c) Discussion and recommendations

The desired standards for water, sanitation and hygiene are much clearer than for other indicators. Their aim is to achieve basic services for all but also, even if in the longer term, to achieve safely managed services. Thus, a few clear recommendations arise, which derive mainly from the contrast between the desired standards, used indicators and information availability.

In the case of water indicators, it is of outmost importance to promote:

1) the incorporation of a detailed list of response categories for water sources that avoids the now common ambiguous categories such as "well". The DHS and MICS response categories could be used, as they are quite exhaustive.

2) the inclusion of a question on whether the water source is inside or outside the premises is also key, as well as the question on the distance to water and – ideally – the question about who typically goes to fetch the water.

These are two small improvements that are absolutely necessary for determining whether there is access to basic service. Additionally, it may be advisable to separate the question on water source for drinking and cooking from water for other purposes.

Further, given that access to basic water service is already quite extensive, incorporating second-order level questions that can determine whether the service is safely managed are highly desirable. This would require (1) incorporating a question such as "how many hours per day does the household have the water service?", and (2) performing the water quality test (which can be done to a subsample, as in MICS).

In turn, to determine whether there is access to basic sanitation service sanitation, it is of fundamental importance that all surveys ask:

(a) about the type of toilet facility (the structure of DHS and MICS presented in table 21 seems very convenient, as it summarises the kind of toilet with the excreta disposal system),

(b) whether the toilet facility is shared with other households or not, and

(c) whether the toilet is within the premises or not.

There is a longer way to go to attain universal basic sanitation than to achieve universal basic water service. However, given that the ultimate goal is achieving safely managed services, a few other questions should be included, namely, the type of excreta disposal system (whether the household is connected to sewerage or not) and, for households using septic tanks, the MICS question about whether the septic tank has ever been emptied, and where was it emptied the last time.

Finally, it would be highly desirable to record the presence handwashing facilities with water and soap, given that the health gains of basic water and sanitation services do not accrue if hygiene practices are not followed.

2. Access to clean energy

Access to clean energy is not yet recognised as a human right (Villatoro, 2017a, p.24), although it is increasingly seen as instrumentally important. The MDGs provided the first significant push to acknowledge and promote increased access to clean fuels. Although the goal of expanding access to electricity was not explicitly mentioned, it was obviously needed to meet the MDGs related to health, gender equality and education (Sachs et al., 2004). In 2011, the UN Secretary-General launched the Sustainable Energy for All initiative,[68] the goal of which was to ensure universal energy access. Then, in 2015, sustainable energy was made an explicit goal of the SDGs (SDG 7). Additionally, the Global Network on Energy for Sustainable Development (GNESD),[69] and the Poor People's Energy Outlook

[68] http://seforall.org
[69] http://www.gnesd.org

(PPEO)[70] have pioneered efforts to develop a people-centred perspective on energy access (Castán Broto et al., 2017, p. 778). Because of its links to poverty, education, health, work productivity, pollution and gender issues, access to clean energies impacts virtually all SDGs.[71]

Standards and indicators in access to clean energy are being developed by the Global Tracking Framework (GTF), led jointly by the World Bank/Energy Sector Management Assistance Program (ESMAP) and the International Energy Agency (IEA). GTF performs an analogous role to that of JMP for WASH.

a) Indicators and standards

Access to electricity and some form of clean cooking fuel is considered within the access to basic services referred to in Goal 1.4. Additionally, Goal 7.1 states "By 2030, ensure universal access to affordable, reliable and modern energy services". Its indicators, 7.1.1 ("proportion of population with access to electricity") and 7.1.2 ("proportion of population with primary reliance on clean fuels and technology"), are both classified as Tier I indicators. However, a lot of work is still being done to determine the most robust and accurate way to measure them.

The cleanest cooking fuels are electricity, gas and, more recently, alcohol (ethanol), as these emit negligible quantities of health-damaging pollutants (Practical Action, 2010). During MDG years, fuels considered unclean were coal and biomass sources: wood, charcoal, crop residues and dung (UN, 2003). Kerosene was considered acceptable. These designations were followed in the global MPI. However, evidence shows that household use of kerosene can lead to levels of particulate matter and other pollutants that exceed WHO guidelines; also, there are significant risks of burns, fires and poisoning. Thus, WHO (2014) has recommended discouraging the household use of kerosene; a recommendation supported by GTF (WB-ESMAP and IEA, 2013).

Energy provides six key services in the household: lighting, cooking and water heating, space heating, cooling, information and communications, and earning a living; each of which has stipulated minimum levels of availability (Practical Action, 2010, p. ix).

The basic two indicators that assess energy access are the proportion of population connected to the electric power grid and the proportion of the population who cook with a clean fuel. Yet, accurate monitoring of progress towards universal energy access requires more than this. "Most often, energy access is erroneously represented as a binary phenomenon" (Castán Broto et al., 2017, p. 777). Empirical evidence shows that households frequently use multiple (clean and unclean) fuels simultaneously (Hiemstra-van der Horst and Hovorka, 2008; Castán Broto et al., 2017).

In view of the complexity of determining access to clean forms of energy, GTF has proposed a Multi-Tier Framework for Measuring Access to electricity and access to cooking fuel, which is a counterpart to the WASH ladders proposed by JMP.

For electricity, the six-tier proposal of GTF combines (a) access to electricity supply, defined by increasing levels of six supply attributes: quantity (peak available capacity), duration, evening supply, affordability, legality and quality; and (b) use of electricity services, defined according to the ownership of appliances categorised by tier, each corresponding to the equivalent tier of electricity supply needed for their adequate operation (GTF, 2013, pp. 83–84). In terms of cooking fuel, the six-tier proposal of GTF combines (a) the technical performance of the primary cooking solution and (b) how those solutions meet the needs of the household (GTF, 2013, pp. 85–87).

Incorporating the necessary questions into household surveys to monitor the full six-tier energy access framework will be a long process. Thus, for immediate action, GTF proposes a simplified three-level measurement system that would require only marginal improvements in data collection (GTF, 2013): No access, basic access, and advanced access. These three levels condense the six-tiers of the multi-tier proposal (Figure 5).

[70] https://policy.practicalaction.org/policy-themes/energy/poor-peoples-energy-outlook.

[71] In terms of health, indoor smoke biomass smoke causes chronic obstructive pulmonary disease, lung cancer, blindness, cardiovascular diseases, acute lower respiratory infections in children and low birth weight (Practical Action, 2010, p.41). Also note that it is women who devote much of their time in tasks that could be facilitated by energy access, plus they spend more time at home, and thus are more exposed to the health risks of non-clean fuels (Practical Action, 2010, p.viii).

Basic electricity access is associated with the level of electricity services that can be provided by a solar lantern whereas *advanced access* includes off-grid and grid solutions. It should be noted that the increasing range of alternatives to generate and distribute electricity in a decentralised way is a promising path, as it is a faster track to reaching people without access to electricity (Power for All, 2016; Castán Broto et al., 2017). These alternatives include pico solar, pay-as-you-go solar home systems, multi-technology (wind, hydro, solar and biomass) mini grids, and mobile solar farms, which are designed specifically for places where the grid cannot reach easily or cost-effectively. Importantly, these alternative ways of generating electricity are also sustainable (Power for All, 2016, p.4).

With the three-tier scheme proposed by GTF, advances under programs such as Lighting Africa and Lighting Asia would be counted as basic access, whereas stand-alone off-grid and mini-grid solutions would be counted as advanced access. However, these three simplified categories do not consider the characteristics that allow a more nuanced evaluation of the service, such as the legality of the connection and the quality and stability of the service (elements that define Tiers 2 to 5, all within 'Advanced Access' in the condensed three tier classification). In fact, legality, quality and stability of the service are prevalent problems in urban areas of countries where the grid is more extensive (such as many countries in Latin America).

No access to cooking fuel corresponds to self-made cookstoves. *Basic cooking fuel access* reflects the use of manufactured non-BLEN cookstoves (BLEN accounts for biogas-liquefied petroleum gas-electricity–natural gas);[72] *advanced access* corresponds to BLEN cookstoves or the equivalent. This measurement system is based on the simple observation of fuels and cookstoves.

Figure 5
Condensed multi-tier energy framework

Tracking access to electricity	Global tracking	**No access**	**Basic access**	**Advanced access**			
		No electricity	Solar lantern, rechargeable battery lantern	**Home system or grid connection**			
	Country-level tracking	Tier-0	Tier-1	**Tier-2**	Tier-3	Tier-4	Tier-5
Tracking access to cooking fuel	Global tracking	**No access**	**Basic access**			**Advanced access**	
		Self-made cookstove	Manufactured non-BLEN cookstove			**BLEN cookstove**	
	Country-level tracking	Tier-0	Tier-1	Tier-2	Tier-3	Tier-4	Tier-5

Source: GTF (2013, figure 2.5, p.89).

One additional point to note is that access to energy has strong links with many other indicators of non-monetary poverty such as tenure, housing materials and durable goods. As happens with water and sanitation services, tenure status affects the possibility and security of the energy services. Housing materials obviously affect the energy requirements for heating or cooling of the home. Finally, energy services and appliances work as complementary goods. Thus, for a better understanding of energy availability and uses, it is essential to have key questions across the different survey modules that identify the interconnections between indicators and construct comprehensive energy indicators.

The global MPI, conceived within the data limitations of 2010, uses the basic definitions for energy deprivation: access versus no-access to electricity (the accuracy of this definition depends on each survey) and use of non-biomass and non-coal cooking fuel (considering kerosene as non-deprived, as was the case in the MDG years). National MPIs, so far, also use similar definitions. A few differences to highlight are that the MPI in Mexico considers a household deprived in cooking fuel if the household uses wood or coal

[72] Non-BLEN cookstoves include kerosene cookstoves.

with no chimney, understanding that the use of wood is not a deprivation *per se*, which is in line with the evidence from many countries (Hiemstra-van der Horst and Hovorka, 2008). In the Dominican Republic's MPI there is deprivation in electricity if the household has electricity less than 14 hours/day, notably incorporating the stability of the service into the deprivation indicator. Also, Armenia and Moldova's MPIs include an indicator of healthy heating (any other source other than central heating, electricity, natural gas or liquefied gas is considered deprived). Armenia also includes an indicator of access to hot running water. South Africa's MPI has three separate indicators: one on fuel for lighting (deprived if household uses paraffin, candles, nothing or other), another on fuel for heating and another on fuel for cooking (deprived if household uses wood/coal/dung, other or none). The MPI of Malaysia includes an indicator on access to electric or kerosene or wood/charcoal stove, already mentioned in the durables goods section.

Developed countries are within the advanced access tiers of both multi-tiers of electricity and cooking fuel. The indicators there focus on heating; in fact the Eurostat indicator for SDG 7.1 is "the percentage of people affected by fuel poverty (inability to keep home adequately warm)" (Eurostat, 2017). This indicator has been previously used in many studies (Townsend, 1979; Mack and Lansley, 1980; Nolan and Whelan, 2011), and it is included in EU-SILC surveys. Moldova includes it in its MPI. Scotland's Tolerable Standard included an indicator on whether the house has "satisfactory facilities for cooking of food within the dwelling" (Atkinson et al., 2002, p. 159).

b) Available data

GTF (2017) considers household surveys as the instruments best suited to obtaining energy data but emphasises the need to design additional energy-focused questions. In particular, it suggests:

a) facilitating the reporting of households served by off-grid technologies (solar lanterns or stand-alone home systems) and households connected to decentralised mini-grids,
b) capturing the level of electricity supplied,
c) identifying electricity applications used within the household, and
d) having comprehensive questions about the fuels and types of cookstoves used by households.

Current surveys are very heterogeneous in their questions about energy. table 24, table 25 and table 26 repoduce the energy questions included in DHS, LSMS and MICS, correspondingly. DHS has remained quite limited; it asks about the main type of cooking fuel used, whether cooking is done inside the dwelling or not, and whether the household has access to electricity (yes/no). The recommended LSMS questionnaire (Grosh and Glewwe, 2000) has some additional questions. In particular, it differentiates the use of energy for lighting, cooking *and* heating. For lighting it includes some limited alternatives beyond "yes/no" regarding access to electricity, and it asks about the number of hours – on average – that electricity was available in the dwelling in the previous month (stability/quality of the service). In the longer version of the questionnaire, it also asks whether the household has an individual electric meter or whether it is shared (which allows capturing the legality of the connection). However, actual implementations of LSMS vary significantly (Villatoro, 2017a). MICS is really at the forefront in terms of the energy module. It asks about kind of electricity connection (if any); the type of cookstove, plus whether it has a chimney and a fan; the main source of energy for the cookstove; whether cooking is done in the house or not; energy for heating; and kind of lighting used. Response categories are very detailed. MICS questions allow for a basic three-tier classification of electricity and cooking fuel. Additionally, they allow measuring the stability of the electrical service. If a question on the legality of the connection was added (e.g., as the question on whether the meter is shared or not in LSMS), it would allow further differentiation of the service level.

Table 23 reflects the state of energy data availability at the country level. We see that about a third of the reviewed surveys have data on the type of cooking fuel and more than a third have data on the source of lighting, but if one excludes the EU-SILC surveys (which do not ask these questions), these percentages are higher (55% and 60%, correspondingly). EU-SILC asks the question about the ability of the household to keep the house warm.

Table 24
DHS energy questions

What type of fuel does your household mainly use for cooking?	Electricity Liquid natural gas Biogas Kerosene Coal, lignite Charcoal Wood Straw/shrubs/grass Agricultural crop Animal dung No food cooked in household Other
Is the cooking usually done in the house or in a separate building or outdoors?	In the house In a separate building Outdoors Other (specify)
Does your household have: Electricity A radio A television A non-mobile telephone A computer A refrigerator	Yes/No Yes/No Yes/No Yes/No Yes/No Yes/No Yes/no

Source: DHS Household Questionnaire, Phase 6.

Table 25
LSMS energy questions

What is the main source of lighting in your dwelling?	Electricity Kerosene, oil or gas lamps Candles or battery flashlights No lighting
How many hours a day on average was electricity available in your dwelling last month?	Number of hours
What fuel do you use most often for cooking?	Gas Electricity Wood Coal Kerosene Peat/manure Other (specify)
Does your household heat your dwelling in winter?	Yes/No
How does your household heat your dwelling?	Water radiators – centralized hot water Water radiators in rooms from a gas, coal or electric boiler within the house Electric heaters Coal stove Wood stove Kerosene stove Stoves for straw, brush, manure, peat Other (specify)
How many months during the last 12 months was your dwelling heated?	Number of months
During how many of those months was your dwelling sufficiently warm?	Number of months
Do you have an individual electric meter or do you share it with other persons?	Joint meter Individual meter

Source: Glewwe et al (2000), vol. 3. Housing Services Questionnaire.

Table 26
MICS energy questions

Does your household have electricity?	Yes, connected to the grid Yes, off-grid (generator/isolated system) No
In your household what type of cookstove is mainly used for cooking?	Electric stove Solar cooker Liquefied petroleum gas /cooking gas stove Piped natural gas stove Biogas stove Liquid fuel stove Manufactured solid fuel stove Traditional solid fuel stove Three-stone stove/open fire No food cooked in household Other (specify)
Does it have a chimney?	Yes/No
Does it have a fan?	Yes/No
What type of fuel or energy source is used in this cookstove? If more than one, record the main energy source for this cookstove	Alcohol/ethanol Gasoline/diesel Kerosene/paraffin Coal/lignite Charcoal Wood Crop residue/grass Straw/shrubs Animal dung/waste Processed biomass (pellets) or woodchips Garbage/plastic Sawdust Other (specify)
Is the cooking usually done in the house, in a separate building or outdoors?	In main house No separate room
If in main house, probe to determine if cooking is done in a separate room.	In a separate room In a separate building
If outdoors, probe to determine if cooking is done on veranda, covered porch or open air.	Outdoors Open air On veranda or covered porch Other (specify)
What does your household mainly use for space heating when needed?	Central heating Manufactured space heater Traditional space heater Manufactured cookstove Traditional cookstove Three-stone stove/open fire Other No space heating in the household

Table 26 (concluded)

Does it have a chimney?	Yes/No
What type of fuel and energy source is used in this heater?	Solar air heater Electricity Piped natural gas Liquefied petroleum gas/cooking gas Biogas Alcohol/ethanol Gasoline/diesel Kerosene/paraffin Charcoal Wood Crop residue/grass/straw/shrubs Animal dung/waste Processed biomass (pellets) or woodchips Garbage/ plastic Sawdust Other (specify)
At night, what does your household mainly use to light the household?	Electricity Solar lantern Rechargeable flashlight, torch or lantern Battery powered flashlight, torch or lantern Biogas lamp Gasoline lamp Kerosene or paraffin lamp Charcoal Wood Crop residue/grass/straw/shrubs Animal dung/waste Oil lamp Candle Other (specify) No lighting in household

Source: MICS 6 Household Questionnaire.

c) Discussion and recommendations

It is of utmost importance to refine the energy questions in household surveys in developing countries in order to meet (at least) the three-tier scheme proposed by GTF. It is important to add questions that allow capturing off-grid technologies, the level of the electricity supplied, what the electricity is used for and type of cookstove).

MICS surveys provide an excellent guide; they cover energy availability and quality for half of the six basic uses identified by Practical Action (2010), namely, lighting, cooking and heating. Additionally, the energy questions can be complemented with the questions on durable goods (addressed in section I.A.4). It would be important to add a question related to the legality of the connection (such as that one in the LSMS about the meter).

3. Solid waste collection and nearby sources of contamination

"The safe removal and subsequent management of solid waste sits alongside the management of human excreta (sanitation) in representing two of the most vital urban environmental services. (...) Failing to manage properly the “back end” of the materials cycle has direct impacts on health, length of life, and the human and natural environment"(UN-Habitat 2010a, p. xx).

While the MDGs did not include an indicator related to solid waste, the SDGs include two explicit references in SDG 11.6.1 and SDG 12.4.2.[73] The evaluation of a comprehensive set of indicators of the waste management system is beyond the scope of this study; here the focus is placed on an indicator of whether some form of solid waste collection service reaches households.

Poor urban areas are typically not reached by a garbage collection service or receive a lower quality service for various reasons, including that households in these areas do not pay taxes and that refuse vehicles are too big to enter unplanned urban areas (UN-Habitat, 2010b). Yet the poor are less able to make their own arrangements for getting rid of their waste (UN-Habitat 2010b, p. 22). Lack of access to a solid waste collection service directly affects health. Uncollected solid waste causes flooding and the subsequent spread of water-borne diseases, and favours the breeding of flies, mosquitoes and rodents (all vectors of serious diseases) (UN-Habitat, 2010a, p. xx).[74] If there are hazardous wastes present in the garbage, contact or exposure to these can cause cancer and birth defects (Spies, 2010).[75]

a) Indicators and standards

There is no *one* ideal waste management system. The convenience of a particular management system depends on a number of factors that vary across countries, across regions within countries and even across areas within cities. The international recommendation is to progress towards an Integrated and Sustainable (solid) Waste Management (ISWM) in each city (UN-Habitat, 2010a). An ISWM needs to consider (1) *public health* (the system must ensure healthy conditions in cities, particularly through a good waste collection service), (2) *environment* (the system must try to protect the environment throughout the waste chain, especially during treatment and disposal) and (3) *resource management* (the system needs to do as much as possible to comply with the "3Rs" – reduce the amount of waste generated, reuse and recycle). In terms of governance, the three keys are to (1) be inclusive (try to involve the different stakeholders to contribute as users, providers and enablers)[76], (2) be financially sustainable (cost-effective and affordable) and (3) rest on a base of sound institutions and pro-active policies (UN-Habitat, 2010a). The recommendation is that cities need to build upon the indigenous processes that are already working well (UN-Habitat, 2010a).

In terms of household poverty indicators, the relevant indicators are the ways in which households dispose of their waste, whether they are served by a municipal waste collection service and its quality (frequency of the service, for example).

The global MPI does not have a solid waste collection indicator. However, three of the national MPIs — Costa Rica, Ecuador and Armenia — include an indicator of whether the household is reached by the waste collection system. Chile and the Dominican Republic include an indicator of nearby sources of contamination.

b) Available data

Many household surveys do not collect information on methods of waste disposal or access to a collection service. DHS, MICS and the reference LSMS module do not include questions on this matter. However, many regular national LSMS-type surveys currently contain one question on the way in which the household disposes of its waste. This is the case in most Latin American countries, for example. The proposed OPHI-MPPN Light Survey Module has such a question (table 27). Another question that is sometimes included simply asks a "yes or no" question about whether the household has access to the municipal garbage pick-up service. table 23 shows that even if either of these two questions (forms of

[73] SDG 11 ("Make cities and human settlements inclusive, safe, resilient and sustainable"); Indicator 11.6.1 is the "Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities". SDG 12 ("Ensure sustainable consumption and production patterns"); Indicator 12.4.2 is "Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment". Europe has adopted a related indicator that is the recycling rate of municipal waste (Eurostat, 2017).

[74] See Spies (2010) for a detailed account of such diseases.

[75] Children are particularly vulnerable to all these health risks: they often play outside; might pick up dangerous materials; and have a faster rate of breathing than adults, thinner layers of skin, and a lower metabolic capacity to detoxify and excrete toxins (Spies, 2010, p. 15).

[76] The informal sector often provides an extensive solid waste collection service and recycling activity (Onyanta, 2016; Wilson et al., 2012; Wilson et al., 2006). The current trend is to integrate informal collectors into the system but to provide them with adequate equipment and training (Spies, 2010).

disposal or pick-up service availability) is included, only 22% of reviewed surveys contain some information on solid waste disposal, and the two questions are obviously not strictly comparable.

Table 27
OPHI-MPPN Light Survey Module question on waste

How do you dispose of your household waste? [Multiple codes apply]	Composting Recycling some items Burning Burying[a] Municipal garbage pick-up Dump in rivers/stream Dump in forest Dump on open land Other (specify)

Source: Own elaboration.
[a] Burying is not actually included as an option in the OPHI-MPPN questionnaire, but it is included as a response category in many Latin American household surveys. Armenia's Integrated Living Standard Survey has a similar question.

Only rarely, is there a question about the frequency of the service (e.g., Honduras' Encuesta Permanente de Hogares de Propósitos Múltiples). Another more rare kind of question is on whether the household separates different kinds of wastes (e.g., Costa Rica's Encuesta de Hogares de Propósitos Multiples). Relatedly, some surveys (e.g., in Argentina and Chile) include a question on whether there is a nearby source of contamination, such as an open dump or a contaminating factory (e.g, table 28).

Table 28
EDSA question on nearby sources of contamination

In the square block/neighbourhood where you live, there is (yes or no) a problem of... • Contaminating factories? • Open dumps? • Flooded yards and/or streets? • Waste burning/grass or pastureland burning/tyre burning? • Pests (rats, cockroaches, other)? • Dust, ashes, earth? • Contaminated rivers, streams?

Source: Questionnaire of Encuesta de la Deuda Social Argentina (EDSA) (2017, p. 6.) A similar question is included in the CASEN (2011) survey in Chile.

c) Discussion and recommendations

The issue of the solid waste collection service has not received the attention it deserves. The environmental and health risks are as serious as that of an unimproved sanitation system. The poor live in areas frequently neglected by the municipal service and the risks are compounded by their other deprivations, making their situation even more vulnerable.

It seems of utmost importance to at least include a question like that in table 27. If there was room for more than that, it could be helpful to add some of the questions detailedm table 28. These enquire about the frequency of the collection system, possibly complemented with a question about where the waste is stored (a low frequency collection service can still be satisfactory if waste is stored properly and if temperatures are not too high). Additionally, if there is interest in monitoring progress towards the "3Rs", one can ask whether households are required to separate recyclable waste. Finally, a complementary question asks whether there is a nearby open dump.

Table 29
Possible further questions on solid waste management system

How frequently is the waste collected in your block?	Every day Every two days Once a week Once every two weeks Other (specify)
[If frequency is lower than every two days] Where is the waste stored between collection days?	At home In a community container that remains open In a community container that can be closed Other (specify)
Are you required to separate recyclable kinds of waste from general waste? (Click on the items that need to be separated from general waste)	Glass Paper and cardboard Plastic Organic
[If waste is separated] The recyclable waste...	Is collected on different days by the municipal collection system Is collected by informal waste pickers Needs to be taken to green/recyclable points by the owner

Source: Own elaboration.

4. Transportation

> "The right to mobility is universal to all human beings and is essential for the effective practical realisation of most other basic human rights" (UN-Habitat, 2013a, p.3). Mobility is not about reaching destinations, it is about *accessing opportunities*. Most trips are not taken for the sake of movement per se, but in order to reach destinations, (…) to meet needs" (Sida, 1999; ODI, 2000; and UN-Habitat, 2013a).

Transport deprivation is one of the many dimensions of poverty that reinforces other deprivations. The rural poor typically lack good connections to product markets, health and educational centres, and water. This is both because of lack of infrastructure, precarious or deteriorated rural transport infrastructure, and a lack of ownership of or access to means of transport (ODI, 2000). Poor transport access means that profits (on what the poor produce) are not made, health emergencies are not attended to, epidemics are not stopped and managed in time (ODI, 2000), and children have limited access to educational opportunities, devastating a possible channel for moving out of poverty.

Although in a better position than the rural poor, the urban poor tend to live in geographically marginalised areas located on the periphery (Sida, 1999; ODI, 2000), which are poorly connected to job opportunities and urban services. They have accepted a trade-off between the cost of housing and long travel distances from city centres (ODS, 2000, p. 52). Even in developed and highly urbanised countries, transportation disadvantages have been identified as a dimension of poverty and social exclusion, reinforcing these states, as exposed by a landmark study done in the UK (SEU, 2003).

Different types of barriers to accessing transportation services have been identified (Church et al., 2000; SEU, 2003). These are (1) availability and accessibility: public transport does not reach certain areas, or the frequency is too low or unreliable, or vehicles are not accessible to disabled people, (2) cost: for many people, personal or public transport costs are too expensive, (3) inaccessible services: hospitals, business and retail are sometimes located in areas not easily accessible to people without a car, (4) safety and security: some people are unwilling to use public transport or walk to key services because they fear crime or antisocial behaviour, or fear road accidents, and (5) time: some people are unwilling to travel long distances or endure long journey times; in many cases this is because of other pressing demands on their time (work combined with household and childcare duties).

The transport system in urban areas is composed of four kinds of transportation: non-motorised transport (NMT), formal public transport (FPT), informal (motorised) transport (also called "paratransit")

(IMT) and private motorised transport (PMT) (UN-Habitat, 2013a).[77] The keys to sustainable and inclusive development are (1) developing a good-quality FPT system, (2) promoting NMT and integrating it into the FPT system and (3) bringing services closer to people.[78] NMT includes bicycles, rickshaws, pedicabs, animal-drawn carts (mostly in rural areas) and walking. The problem is that developing countries have low-quality infrastructure for NMT: poor lighting, an absence of footpaths, overcrowding and limited speed enforcement, increasing the risk of accidents (UN-Habitat, 2013a). FPT is a shared passenger transport service available to the general public. It includes cars, buses, trolleys, trams, trains, subways and ferries that are shared by strangers without prior arrangement.[79] Public transport runs on specified routes, has well-designed "stops" for passengers to embark and disembark in a safe manner, follows a timetable and has set fares. The public transport in developing countries – if existent at all – is often poorly maintained, resulting in low-quality service and risks to passengers.

Guidelines (1) to (3) are part of a paradigm shift in transport policy from expanding infrastructure (per se) with highways, viaducts and flyovers, tunnels and footbridges as the symbol of a modern city to promoting accessibility (UN-Habitat, 2013a, b).[80] The goal is to favour compact and connected cities, built around mass public transport. Such cities can be more economically dynamic, healthier and have lower emissions (GCEC, 2014). Weiss et al.'s (2018) study on global travel time to cities exposes the current tremendous disparities in accessibility: they found an unequivocal association between accessibility to cities and indicators of human well-being in low-to-middle income countries. They also found that highly accessible areas include those with abundant transport infrastructure and/or many spatially disaggregated cities.

a) Indicators and standards

The relevance of the transport dimension for development has been recognised in the SDGs. While the MDGs did not include a transport indicator, this theme appears in SDG 9 and in SDG 11, with explicit reference to and focus on the most vulnerable groups affected by transport disadvantage.[81] SDG 11.2 states: "By 2030 provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons". Indicator 11.2.1 is the "proportion of population that has convenient access to public transport, by sex, age and persons with disabilities", which is categorised as a Tier II indicator (UN, 2017b). The indicator refers to urban areas only.

The metadata for SDG Indicator 11.2.1 (UN 2017e) defines convenient access to public transport as when an officially recognised stop is within 0.5 km of a reference point such as home, school, work place, market, etc. Additionally, it has to be accessible to all special-needs customers (the physically, visually and/or hearing impaired; those with temporary disabilities; the elderly; children; and other people in vulnerable situations), offer frequent service during peak travel times, and stops must be in a safe and comfortable environment.

Indicator 11.2.1's recommended methodology relies on a city's administration or service providers mapping the officially recognised public transport stops and the population reached by these. However, the metadata also recommends household surveys collect information on whether the household has access

[77] IMT consists of privately owned vehicles that do not meet one or more legal requirements (necessary permits, size of the vehicle, insurance), or that deviate from routes or stipulated fares (UN-Habitat, 2013a).

[78] The increased use of PMT is a major environmental concern: the transport sector is one of the biggest contributors to greenhouse gas emissions (Sida, 1999; UN-Habitat, 2013). Under the Paris Agreement (UNFCCC, 2015) countries have committed to reducing CO2 emissions to keep the average temperature increase below 2°C. "Decarbonising the road transport" requires increasing the efficiency of fuel-propelled vehicles and introducing alternative vehicles, such as electric vehicles (Andwari et al., 2017; Egbue et al., 2017; Hao et al., 2017; Newbery and Strbac, 2016).

[79] UN (2017e) Metadata of SDG Indicator 11.2.1

[80] This accessibility concept differs from the accessibility requirement of an adequate shelter and is closer to the location requirement presented.

[81] SDG 9 aims at building resilient infrastructure, promoting inclusive and sustainable industrialization and fostering innovation; Target 9.1 is to develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.

to public means of transport within 0.5 km. The aspects of affordability and quality of the service can also be obtained from surveys.[82] [83]

Armenia, Bhutan and Chile's national MPIs include transport-related indicators. Armenia identifies as deprived households that consider the roads within their settlements or to regional towns or markets to be in a poor state.[84] Additionally, there are indicators regarding the accessibility of health and educational facilities (within 20 minutes by any means of transportation). Bhutan includes an indicator that identifies households as deprived if they are more than a 30-minute walk from the road head. The MPI in Chile includes an indicator that defines households as deprived according to the distance to the closest FPT stop, to the closest health-care centre and to the closest school. If the household has employed members, it is also identified as deprived if employed members need to spend more than an hour reaching their work using public transportation or NMT.

The Chilean indicator can be seen as an indicator of accessibility in the broad sense (to nearby services and opportunities), rather than transport access only. Certainly, a long commute time is not necessarily associated with poverty, but such cases can be identified because they will not exhibit other deprivations.[85] Still, for policy information, it may be useful to keep the indicator on distance to a FPT stop separate from the indicator of commuting time, which possibly reveals spatial segregation rather than an inefficient FPT.[86]

b) Available data

Although indicator 11.2.1 is not overly ambitious, information from household surveys at the moment is actually scarce or non-existent. DHS, MICS and OPHI-MPPN surveys do not include any transport questions. EU-SILC surveys include the reason "too far to travel/no means of transportation" among those for an unattended medical examination or treatment.

LSMS recommended modules (Grosh and Glewwe, 2000) include several transport-related questions. A set of accessibility questions is included in the education module (table 30 and table 31), and the same set is included in the health module. These questions record proximity to educational and health centres, mode of transportation used, travel time and cost involved. These questions also offer some indirect information about access to public means of transport within 0.5 km, but the question is not explicitly stated as such. Information for that indicator is better collected in the LSMS-recommended community module on transport (table 32), but this module is not often included.

For example, most (LSMS type) household surveys in Latin America ask whether the person received in-kind payment or income for transportation to and from work, but nothing about distance or accessibility. Peru's Encuesta Nacional de Hogares, Condiciones de Vida y Pobreza survey asks about whether the household made use of different specific means of transport, the frequency with which they were used and the amount paid, with the ultimate aim of estimating transport expenditure. Uruguay's Encuesta Continua de Hogares asks about the mode of transport used for going to work.

Interestingly, Bhutan's Living Standard Survey offers a compact set of questions on accessibility to a range of services, including a bus stop (means of transport and time spent accessing each service) (table 33). EDSA (2017) in Argentina also has a compact, but less informative, set of questions on accessibility (table 34).

Detailed information on transport access and quality of service is actually collected through specific transport surveys, such as the National Travel Survey in the United States (US. Dept. of Transportation, 2009) and the United Kingdom (UK Govt., 2013), including questions on accessibility, safety and quality of the service. While these surveys also collect some socio-economic variables, they miss many of the

[82] As a guideline for an affordability indicator, the poorest quintile should not spend more than 5% of household income on transport.

[83] In the context of developed countries, SEC (2003, Annex A) proposed a list of potential indicators for monitoring improvements in accessibility.

[84] However, households in urban areas are usually not asked this question, and they are assumed to be non-deprived.

[85] Additionally, commuting times may be different for different household members. This requires defining a criterion (union, intermediate, intersection) to determine deprivation in the household. This is addressed further in section II.

[86] As with virtually all the other dimensions, transport, understood within the broader concept of accessibility, is itself multidimensional and would thus permit the design of a dimension-specific multidimensional index.

other indicators reviewed in this report (housing materials, overcrowding, tenure, water and sanitation, energy, solid waste collection, etc.).

Table 30
LSMS transport-related questions within the education module

How far away is the school you have been attending in the last 12 months?	
How long does it take you to travel to school?	
How do you get to school?	Walking Bicycle Car Bus Train Boat Animal Other [specify]

Source: Own elaboration

Table 31
Distance to local schools questions (in the education module) and distance to health facility questions (in the health module)

What is the name of the [...] that is nearest your home?	
What is the name of the [...] that is second/third nearest your home?	
How far away from your home is this in kilometres?	(This is recorded for *each* of the three mentioned facilities in each case: schools/public hospitals/public health clinic/private hospital/clinic)
What mode of transportation would you use to travel to this [...] from your home?	Walking Bicycle Car Bus Train Boat Animal Other [specify]
How much money does it cost to use this mode of transportation to go to this...?	Roundtrip cost (This is recorded for each of the three mentioned facilities in each case.)
How much time does it take to travel to this [...] from your home using this mode of transportation?	Time one way Hours: Minutes: (This is recorded for each of the three mentioned facilities in each case.)
Is there another [...] located within [...] kilometres of your home?	Yes/No

Source: Own elaboration.

Table 32
LSMS transport module (community module)

Now I would like to know about transportation in this community to places that community residents sometimes use, such as bus terminals, markets and post offices. [First ask question 1 for each line, then ask questions 2–7 for each line]	
1. Is the [...] located within or outside the boundaries of the community?	Nearest local bus terminal Nearest intercity bus terminal Nearest daily market Nearest periodic market Nearest place to use a telephone Nearest post office Administrative capital (Level 1) Administrative capital (Level 2)
2. How far is the [...] from the community centre in kilometres?	[Response for each of the services mentioned in 1]
3. Is it possible to travel from the community centre to the [...] using public transportation?	[Response for each of the services mentioned in 1]
4. What is the most common mode of transportation to travel from the community centre to the [...]?	[Response for each of the services mentioned in 1]
5. How much does it cost to travel to the [...] from the community centre using this mode of transportation?	[Response for each of the services mentioned in 1]
6. How long does it take to travel from the community centre to the [...] using this mode of transport?	[Response for each of the services mentioned in 1]
7. Is motorised transportation regularly available to transport people within this community?	Yes/No
8. What types of transportation are regularly available?	Motorbikes Motorised tricycles Car taxis Minibuses Trains Boats Other (specify)
9. Is motorised public transportation available to transport people out of this community to other towns or regions?	Yes/No
10. What is the most common type of road surface in this community?	
11. Is there no road report on the road that passes closest to the community?	No roads, only waterways Asphalt or cement Paved roads (stones, pebbles, etc.) Dirt roads Other (specify)
12. Can four-wheeled motor vehicles travel on the main road in this community?	Yes/No
13. How many years has it been since this road was graded?	Years
14. During the past 12 months how many months was the main road passable by car? How many months was it passable by a heavy truck?	Months passable by car Months passable by a heavy truck
15. Are boats an important means of transportation in this community?	Yes/No
16. For how many months in the last year could motorboats travel in the main waterway?	Months
17. What is the price per litre of [...] in this community?	Gasoline Oil Kerosene

Source: Own elaboration.

Table 33
Transport-related questions of Bhutan's Living Standard Measurement Survey 2007

How do you usually get to the [service]		How long does it take to get to the nearest [service]? (hours/minutes)	
1. Foot	5. Car		
2. Bicycle	6. Foot + vehicle		
3. Motorcycle	7. Other		
4. Bus	8. Not applicable		
Post office		Hrs:	Min:
Nearest phone (if at home, skip)		Hrs:	Min:
Police		Hrs:	Min:
Hospital/health unit		Hrs:	Min:
Drugstore, pharmacy		Hrs:	Min:
Municipality		Hrs:	Min:
Source of firewood		Hrs:	Min:
Tarred road		Hrs:	Min:
Feeder road		Hrs:	Min:
Food market/shop		Hrs:	Min:
Bank		Hrs:	Min:
Agricultural/livestock extension service		Hrs:	Min:
Village temple		Hrs:	Min:
Petrol station		Hrs:	Min:
Bus station		Hrs:	Min:

Source: Own elaboration.

Table 34
EDSA (2017) questions related to distance to services

How many blocks from your dwelling do you have....	Less than five blocks	Between five and ten blocks	More than ten blocks/ there is none in the neighbourhood	Don't Know
A public or private health centre?				
A sports or social club?				
A place for retired people to socialise?				
The closest park?				
The closest ATM?				

Source: Own elaboration.
Note: Less than five blocks is within 0.5 km. The CASEN (2011) survey in Chile uses a 20-block threshold (2.5 km) in these types of questions, except for the distance to the nearest bus stop, which must be within eight blocks (1 km).

c) Discussion and recommendations

Transport deprivation, coupled with spatial segregation, is an important poverty dimension. While monitoring improvements in transport systems involves a complex number of issues and requires data from various sources, household surveys should include the questions required to compute the accessibility to public transport indicator. Having a set of core indicators of non-monetary poverty in the *same* household survey instrument is the only way in which joint deprivations can be assessed.

Table 35 contains a set of possible transport-related questions to include in surveys. Question 1, first row, is the minimum requirement for computing indicator 11.2.1 according to the (minimum) specifications of its metadata (proportion of people with access to a public transportation stop within 0.5 km, i.e. less than five blocks).[87] For a more comprehensive assessment of accessibility issues, the questions which refer to a range of services that are desirable to have near home, can be incorporated. However, because the nearest service is not always the one actually used by households (for quality or other reasons), questions 2 and 3 (based on Bhutan's LSMS in table 33) cover means of transport and

[87] Preferably, the means of public transport should be differentiated, as this allows a more nuanced analysis of environmental impact.

duration of journey to services actually used. While this exceeds the scope of a strict focus on transport efficiency, it allows inferring the quality of the services in the neighbourhood. Questions 4 and 5 would provide some indication of quality, accessibility and other potential barriers to public transport as well as to using NMT, which will provide further insights. These questions can also be complemented with the question on durable goods, which collects information about ownership of certain means of transport (car, bicycle and motorcycle).

Table 35
Proposed transport-related questions

1. How many blocks from your dwelling do you have...		**Less than five blocks**	**Between five and ten blocks**	**More than ten blocks/ there is none in the neighbourhood**	**NA**	**DK**
The nearest public transport station	Metro					
	Train					
	Bus					
The nearest school						
The nearest health unit						
The nearest pharmacy						
The nearest ATM or bank						
The nearest food/market shop						
The municipality or council building						
A road[a]						
Your work						

2. How do you usually get to [the service]		**Means of transport**	**3. How long does it take to get to the [service] you usually go to? (hours/minutes)**	
1. Foot	**5. Car**			
2. Bicycle	**6. Foot + vehicle**			
3. Motorcycle	**7. Other**			
4. Bus	**8. Not applicable**			
The public transport station (bus/train/metro) you use most frequently			Hrs:	Min:
The school your children attend			Hrs:	Min:
The health unit you usually visit			Hrs:	Min:
The pharmacy you usually visit			Hrs:	Min:
The ATM or bank you usually attend			Hrs:	Min:
The nearest food/market shop you usually attend			Hrs:	Min:
Your work			Hrs:	Min:

4. What barriers prevent you from making more journeys via public transportation?	I prefer the car I prefer walking or cycling Lack of information on routes and timetables Distance from bus/train stop to final destination Cost Length of the journey Safety concerns The vehicle is uncomfortable It is difficult to get on and off the bus Other [Specify]
5. What barriers prevent you from making more journeys by foot or bicycle?	I cannot walk long distances I cannot walk at all I cannot cycle long distances I cannot cycle at all I have security concerns Other [Specify]

Source: Own elaboration.
[a] Including “road” as a category is relevant in rural areas and peripheral marginalised urban areas.
The CASEN survey has a question similar to 1.

II. The affiliation sphere

In this study the affiliation sphere encompasses three fundamental dimensions of life and refers to the core institutions of societies that allow human beings to develop, integrate into the social network, acquire a sense of attachment and construct a personal identity. These are education, work and social protection, and health care. The three have several commonalities: (1) they have been recognised as human rights; (2) have intrinsic and instrumental value (enabling rights); and (3) they have formal and informal elements, and while both may play a role, it is the *formal* link to education, work and social protection, and health care, that really enhances human development and prevents poverty.[88]

There are two practical issues with the construction of indicators in this sphere that should be noted if these are to be included in an MPI. Both issues derive from the same characteristic of indicators in this sphere. All of the previously analysed indicators (housing, overcrowding, tenure, durable goods, water, sanitation and hygiene, energy, solid waste collection and transport) are measured – by definition – at the household level.[89] It is assumed that access to all these goods and services is enjoyed and equally shared among all household members, even when this may not always be accurate (Deaton, 1997, ch.4; Alkire et al., 2015, ch.7). In contrast, the indicators within the affiliation sphere are primarily defined at the individual level. These indicators are concerned with the child who is not attending school, the woman who cannot find employment, the elderly person who is not receiving his or her pension, or the child who is not receiving proper health care.

The challenge arises from the definition of the entity to be identified as poor or non-poor, which is not a minor decision. The unit of identification is usually the individual or the household. Each has advantages and disadvantages, which are discussed in the companion document (Santos 2018b). The most common practice so far has been to select the household as the unit to be identified as poor.[90] In fact, all except one of the MPIs considered in this study use the household as the unit of identification. The only exception is the MPI-EU, which uses individuals who are 16 years and older as the unit of identification.

[88] The Human Development Index indirectly includes these dimensions (income is typically a product of work and/or social protection; longevity is the product of adequate health care).

[89] Transport is the only dimension that may have variation across household members (i.e. means used; availability of certain required services by age).

[90] Note that even if the unit of identification is the household, the poverty figures can be reported in terms of people. For further discussion on this matter, see Alkire et al., 2015, ch. 7, and the companion document to this Report (Santos, 2018b).

When the unit of identification is the household, indicators that are originally defined at the individual level need to be 'transformed' so that "…they reflect deprivations of just one unit of identification" (Alkire et al., 2015, p. 221).

Thus, the first issue to resolve is how to convert individual-level indicators into household-level indicators, which needs to consider the indicator's "applicable population". The applicable population refers to the group of people for which a particular achievement is relevant; namely, it *can be* measured *and has been effectively* measured (Alkire et al., 2015, p. 222).[91] Some achievements are conceptually applicable to the whole population (nutritional indicators, for example), but, still are not collected for every household member. Other achievements are conceptually inapplicable to certain groups of the population (for example, earned income for children). The existence of non-applicable populations poses a problem to be resolved when constructing a poverty measure, if that measure is to reflect their poverty also (p. 222).

The typical approach followed when the unit of identification is the household is "to use achievements drawn from a subset of household members (those for whom the individual indicator is conceptually applicable *and* has been measured), and make explicit assumptions about the distribution of such achievements and potential positive or negative intra-household externalities" (Alkire et al., 2015, pp. 224–225).

When following this route, the most common procedure has been to use two levels of cutoffs: one at the individual level and another at the household level.[92] With the cutoff at the individual level one can identify whether an *individual* household member is deprived or not in a certain indicator, such as whether a school-aged child is not attending school or whether an adult's BMI is below 18.5. With the cutoff at the household level, one can determine whether the *household* is deprived or not. In this respect there are two possible extreme criterions to follow, as well as some intermediate criteria. The union criterion defines a household as deprived in a certain indicator if there is at least one person experiencing deprivation in that indicator. Then, for example, with this criterion, a household is deprived in school attendance if there is at least one school-aged child not attending school. At the other extreme, there is the intersection criterion, which requires all the (applicable population) household members to be deprived in a certain indicator in order to identify the household as deprived. An intersection criterion type of indicator would then require all school-aged children not to be attending school in order to identify the household as deprived in school attendance. In between, intermediate indicators can be defined using some proportion of the household members experiencing deprivation as the benchmark for identifying the household as deprived. Santos (2018b) offers more discussion on this issue. The precise criterion followed in each case in the different MPIs will be made explicit.

A second relevant issue to consider when going from indicators of individual deprivation to indicators of household deprivation is how to treat households that do not have any member to whom a certain indicator is applicable. For example, how should households with no school-aged children for the school attendance indicator or households with no nutritional information because there are no children under five years of age be treated? The practice so far has been to consider households with no applicable population for a certain indicator as non-deprived in that indicator. While this may not be perfect, other alternatives may have bigger problems (see Santos, 2018b and Alkire et al., 2015, p. 225).

It is worth clarifying, however, that in the case in which the indicator is conceptually applicable to household members but data is not collected (say nutrition), assuming that there is no deprivation in the household in this indicator is a conservative approach and will lead to a lower bound estimate (Alkire et al., 2015, pp. 225–226).

[91] This is different from the 'eligible population', which is the population that has been defined as eligible to collect information from on a specific indicator (say, nutrition) in a particular survey.

[92] Note that these "two levels of cutoffs" occur prior to the *dual cutoffs* referred to in the Alkire-Foster (2011) methodology. The dual cutoffs of the Alkire-Foster methodology refer to having an indicator cutoff (to determine whether the household is deprived or not in each indicator) and a poverty cutoff (to determine whether the household is multidimensionally poor). The point is that with indicators that are primarily defined at the individual level, an additional cutoff is required *before* the household-level indicator cutoff. The union, intersection and intermediate criterion options apply to distinguishing household-level cutoffs (from individual ones) as well as to defining poverty cutoffs (from the different deprivations).

Of course, if the unit of identification is the individual, there is no further need to "transform" individual achievements into household achievements. This approach may potentially result in a more nuanced analysis, with gender and age decompositions, and an evaluation of the intra-household distribution of poverty. However, this option is not completely problem-free either because the range of indicators that are applicable to all individuals (i.e. "universal") is somewhat restricted. Santos (2018b) discusses these issues further.

A. The education dimension

Education has been widely recognised as a human right[93] and also an *enabling* human right (UNESCO et al., 2015). It is a key instrument for achievements in other important dimensions, such as decent work, better health and social participation.

The Education for All (EFA) Framework, adopted during the World Education Forum in April 2000 in Dakar, set up six educational goals and propelled significant progress in global education.[94] Although less ambitious than the EFA Framework, MDG 2 ("achieving universal primary education") played a key role in the progress achieved in this dimension. However, EFA has yet not been achieved (UNESCO, 2015). There are still 58 million children out of school globally and around 100 million children who do not complete primary education. Moreover, the world's poorest children are four times more likely not to go to school than the world's richest children, and five times more likely not to complete primary school; they are also the least likely to attend early learning programmes (UNESCO 2015, p. 3).

When compared to the MDGs, the education goal and targets of the SDGs have significantly "raised the bar", moving from the goal of having every child in school to the expanded objectives of ensuring that certain minimum skills are actually acquired and educational access extended to younger-aged children. SDG 4 integrates the EFA approach into one overall international development framework within the education theme table 36 presents some selected SDG education targets. The UIS is the official source of cross-nationally comparable data on SDG 4 and for producing the Global Education Monitoring Report (GEM Report). Data on educational indicators must be classified according to the levels and fields of education of the International Standard Classification of Education (ISCED) (UNESCO-UIS, 2012).[95]

Table 36
Selected SDG education targets

SDG 4: By 2030, ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	
Target	**Indicator**
4.1: Ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes	4.1.1: Proportion of children and young people: (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex.
4.2: Ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education	4.2.1: Proportion of children under 5 years of age who are developmentally on track in health, learning and psychosocial well-being, by sex. 4.2.2: Participation rate in organized learning one year before the official primary entry age, by sex.
4.6: Ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy	4.6.1 Proportion of population in a given age group achieving at least a fixed level of proficiency in functional (a) literacy and (b) numeracy skills, by sex.

Source: Own elaboration.

[93] UDHR (UN, 1948, art. 26), the Convention against Discrimination in Education (UNESCO, 1960), the International Covenant on Economic, Social and Cultural Rights (UN, 1966, art. 13), the Convention on the Elimination of All Forms of Discrimination against Women (UN, 1979), the Convention of the Rights of the Child (1989, art. 28), the Convention on the Rights of Persons with Disabilities (UN, 2006), the Convention relating to the Status of Refugees (UN, 1951), and the Resolution on the Right to Education in Emergency Situations (UN, 2010).

[94] Details on the six goals can be found at: http://portal.unesco.org/es/ev.php-URL_ID=22012&URL_DO=DO_TOPIC&URL_SECTION=201.html.

[95] http://uis.unesco.org/sites/default/files/documents/international-standard-classification-of-education-isced-2011-en.pdf. See also the ISCED Operational Manual.

Including quality of education is relevant to outcomes; for example, it is estimated that at least 250 million primary-school-aged children, more than 50% of whom have spent at least four years in school, cannot read, write or count well enough to meet minimum learning standards (UNESCO et al., 2015, p.10). These deficiencies are particularly prevalent among poor children, which dilutes the potential of education as a mechanism to overcome poverty (World Bank, 2005; Santos, 2011). However, broadening the scope of the educational goal so much also has the risk of weakening its policy impact. Indicator 4.1.1 is classified as Tier III (UN, 2017b). Although UIS identified nine cross- national learning assessments that could be used, there are still many issues to be resolved.[96] These issues include identifying globally relevant areas of learning and balancing them with local goals, and defining deprivation thresholds (UIS, 2017, box 9, p. 40). Moreover, data from these assessments (implemented for in-school children only) cannot be integrated with data from household survey data, which contain information on the other indicators assessed in this review. Indicators 4.2.1 and 4.6.1 are classified as Tier II; whereas Indicator 4.2.2 is Tier I, as it is a more traditional access indicator.

In the case of developed countries, Eurostat indicators for SDG 4 (2017) include an indicator on early childhood education and care; early leavers from education and training; underachievement in reading, maths and science using PISA; and young people (aged 18–24) neither in employment nor in education and training.[97]

Despite the acknowledged importance of quality of education, here, the focus is on an access indicator – child school attendance – and an achievement indicator – adult schooling (which is ultimately also an access indicator). Clearly, neither of the two implies that necessary and relevant cognitive skills have been acquired. However, some important advantages are (1) they can be computed relatively straightforwardly with traditional household survey information; (2) they can be compared over time in a long series, providing continuity (though not exact continuity) with the MDG enrolment indicator; (3) they are available in the same survey instrument that collects information on the other indicators, allowing the evaluation of joint deprivations; (4) they are a prerequisite for acquiring competencies in the world today; (5) they can be extended to cover from early childhood education to secondary school, echoing SDG 4.2 (Villatoro, 2017a); (6) they are closely related to three proposed thematic indicators detailed in UIS (2017, table 1, p. 14), (completion rate, out-of-school rate and youth/adult educational attainment rates); and (7) they have been widely used in measures of poverty.

Moreover, evidence still reveals that the poor in the developing world are the ones with greater disadvantage in access to school and schooling completion (UNESCO, 2015).

1. Child school attendance and adult schooling achievement

a) Indicators and standards

Child school attendance and adult schooling are included in the global MPI. The attendance indicator is defined such that a household is considered deprived (and thus all its members) if any school-aged child in the household is not attending school up to class 8 (data on the mandatory age to start school in each country is taken from UIS).[98] The adult schooling indicator is defined such that a household is considered deprived if no household member aged 10 years or older has completed five years of schooling (Alkire and Santos, 2010, 2014).

Indicators of school attendance and adult schooling achievement have been included in UBN measures in Latin America since the 1980s. The MPI-LA (Santos et al., 2015; Santos and Villatoro, 2016) updated the UBN thresholds according to the standards set in recent legislation as well as the current prevailing educational standards (Villatoro, 2007). In the MPI-LA, households are deprived if there is at least one child or adolescent between 6 and 17 years of age who is not attending school. For adult schooling, the MPI-LA requires lower secondary school completion for people between 20 and 59 years of age, and primary school completion for people aged 60 years or older.

[96] See UIS (2017), p. 38, fn. 13.

[97] Further specifications can be found at http://ec.europa.eu/eurostat/data/database. Some of these indicators had been recommended by Atkinson et al. (2002).

[98] http://stats.usi.unesco.org/unesco/TableViewer/tableView.aspx?Reportld=163.

Fourteen of the nineteen national MPIs include a child school attendance indicator and seventeen include an adult schooling indicator. There is significant variation across countries in terms of the age range considered in the attendance indicator, as well as the number of years covered (see table 37). Nine countries use a lower age bound that is either the official entrance age for pre-primary school education or at least one year younger than the official entrance age for primary education. All countries cover at least two years of secondary school education. Four countries consider an age range compatible with theoretically completing all secondary education, and three countries use an extended age, allowing for late entry and repetition.

All MPIs mentioned here (global, LAC regional and national MPIs) consider all household members as deprived if there is at least a child (in the defined age interval) who is not attending school.

Table 37
Age range of school attendance indicator in national MPIs

Country	Lower age bound[a]	Upper age bound[a]	Num.. of years cover	Official entrance age for primary	Theoretical duration of primary	Official entrance age to (lower) secondary	Duration of secondary (lower+upper)	Number of theoretical years of secondary school covered in the indicator
Honduras	3 (EPP)	14	12	6	6	12	5	3
Mexico	3 (EPP)	15 (EUS)	13	6	6	12	6	4
El Salvador	4 (EPP)	17	14	7	6	13	6	5
Panama	4	17	14	6	6	12	6	6[c]
Chile	4	18	15	6	6	12	6	7[d]
Nepal	5 (EP)	12	8	5	5	10	7	3
Vietnam	5	15	11	6	5	13	7	5
Costa Rica	5	17	13	6	6	12	5	6 [d]
Ecuador[b]	5	17	13	6	6	12	6	6 [c]
Dominican Rep.	5	20	16	6	6	12	6	9 [d]
Pakistan	6	11	5	5	5	10	7	2
Bhutan	6	14	9	6	7	13	6	2
Colombia	6 (EP)	16	11	6	5	11	6	6 [c]
Armenia	6 (EP)	17	12	6	4	10	8	8 [c]
South Africa	7 (EP)	15	9	7	7	14	5	2
Malaysia	7	16	10	6	6	11	7	5
Arab MPI	EP age	EP age+7	8					

Source: Own elaboration based on each country's national MPI and UIS information on the official entrance ages for each level and the theoretical duration of each level.
[a] EPP is the official entrance age for pre-primary school (ISCED 0). EP is the official entrance age for primary school. Countries that do not have any clarification (such as EP or EPP) are such that the lower age bound of the attendance indicator is in between the official entrance age for pre-primary school and the official entrance age for primary school – except for Pakistan and Malaysia, which use a lower age bound that is the official entrance age to primary school +1. EUS is the official entrance age for upper secondary school (ISCED3).
[b] Ecuador has an attendance indicator adjusted for age: it counts as deprived children between 5 and 14 years old who are not attending primary school and young people between 15 and 17 who are not attending secondary school.
[c] These countries' schooling indicators cover the full theoretical duration of secondary school.
[d] These countries' schooling indicators cover more years than the theoretical duration of secondary school, presumably allowing for late entry and repetition.
The rest of the countries' indicators cover some range of the theoretical duration of secondary school.
Mozambique also includes a child school attendance indicator, but the age range is not explicitly specified.

The adult schooling indicator in the national MPIs also has some variation (see table 38). About half of the MPIs considered here identify the household as deprived if there is at least one member who has not completed a certain level of schooling or number of years of schooling (i.e. union criterion), whereas the other half of the MPIs (including the global MPI and the MPI-LA and Arab MPI) use an intersection criterion, by which the household is deprived if no household member has completed a certain level. Latin American national MPIs (except for Honduras and Ecuador's MPI), as well as the MPI-LA, typically require different levels of schooling for different age ranges: complete secondary education for

the younger generation, primary education for older people, and sometimes literacy for the oldest people. The other countries place the same requirement (but one that is not too-demanding) regardless of age (but most definitions restrict the indicator to the "adult' population, starting at 10 or 15 years). Ecuador additionally has an indicator for youth not accessing tertiary education for economic reasons. Costa Rica and Moldova use two indicators for schooling, one referred to as "adult population" that uses an intersection criterion and another referred to as "younger population" that uses a union criterion. Colombia uses an intermediate criterion, requiring that the average number of years of education of the adult household members is at least nine.[99]

Table 38
Definition of the (adult) schooling achievement indicator in national, regional and global MPIs

Country	Deprived if...		
	At least one household member... (union criterion)	Intermediate criterion	No household member... (intersection criterion)
Honduras	15–49 years old has six years or less of schooling		
Mexico	People born before 1982: completed primary school, or People born from 1982 onwards: have not completed secondary school		
Panama	18–30 years has not completed pre-secondary education (nine years), or 31–59 years old has not completed primary school (six years), or 60 + years who are illiterate		
El Salvador	18–64 years has not completed secondary school, or 65+ years has not completed sixth grade of primary school		
Chile	18+ years has attained less than the schooling required by law according to his/her age		
Costa Rica	18–24 years has not finished secondary school		For 25–64 years of age people the requirements are: People born before 1957: complete primary; People born between 1957 and 1978: "general basic education"; People born after 1978: complete secondary school
Ecuador	18–64 years old who have not completed basic education (10 years of schooling) and are not attending school. Another indicator:18–29 years of age with no access to superior education for economic reasons.		
Dominican Republic	21–29 years who has not completed (and is not attending) upper secondary school, or 30–39 years who has not completed lower secondary school, or 40–59 years who has not completed primary school (8th year), or 60–69 years who has not finished 4th year of primary school, or 70+ years who is illiterate		
Colombia		The average years of schooling of household members 15 years or older is less than nine years [a]	

[99] The MPI-EU is a poverty index defined for the population that is 16 years and older, and the unit of identification is the individual.

Table 38 (concluded)

Country	Deprived if...		
	At least one household member... (union criterion)	**Intermediate criterion**	**No household member... (intersection criterion)**
Armenia			No member aged 15 or older has completed secondary education
Moldova			There is no working age (15–56 among women and 15–62 among men) household members with secondary education or more
	At least one child aged 12–15 has not completed primary school, or aged 15–18 has not completed lower secondary school		
Vietnam	At least a household member does not have upper secondary school or vocational training		
Pakistan			No man OR no woman aged more than 10 has completed five years of schooling
Nepal			No household member aged 10 years or older has completed five years of schooling
Bhutan			No household member has completed five years of schooling
Arab MPI			No household member has completed primary schooling (to identify acute poverty)/ secondary schooling (to identify poverty)
MPI-LA			Households where no member 20 years or older has achieved a minimum schooling level, which is defined as complete lower secondary school for people between 20 and 59 years, and complete primary school for people aged 60 years or more
Global MPI			No household member aged 10 years or older has completed five years of schooling
South Africa			No household member aged 15 or older has completed five years of schooling
Malaysia			No household member aged 17–60 has completed 11 years of education If all members are 60+, no member has completed six years of education
Mozambique			No household member finished primary school

Source: Own elaboration based on each country's national MPI (each of which is referenced in the introduction of this chapter).
[a] When the household has no members aged 15 years or more it is considered deprived.

Additionally, Costa Rica, El Salvador, Chile, the Dominican Republic and Colombia include an educational gap indicator (children of school age who are attending school but who are one or more years delayed with respect to the grade they should be in according to their age). Panama has an indicator of grade repetition.[100] Pakistan also has an indicator that identifies households as deprived if any child is not going to school because of quality issues (as declared by the respondent) (not enough teachers, schools are far away, too costly, no male/female teacher, substandard schools, etc.), or is attending school but remains dissatisfied with the service.

Aside from many countries having a child school attendance indicator with an age range that starts with a pre-primary education age, El Salvador, the Dominican Republic and Colombia have a separate indicator of early childhood care. These indicators aim at capturing the deprivations of young children who do not attend an early childhood education centre and remain at their homes without adult supervision. Early childhood education is highlighted in SDG 4.2 and with good reason as evidence shows that early childhood care and development critically affects outcomes and performance for the rest of life (UNESCO, 2007). Early childhood care is one of the rights of children as stated in the Convention on the Rights of the Child.

Early childhood care and education (ECE) targets two age groups: children 0–3 years old and children from 3 years old to the age of primary school entrance (most commonly 6). When these programmes comply with a number of conditions, they are considered ISCED level 0. The key condition is that these programmes must have an intentional educational component of sustained intensity and duration (OECD, 2017). Identifying programmes that comply with the desired characteristics through household surveys is not so straightforward. However, UNESCO (2007) had a more flexible approach towards ECE definitions, including formal and informal settings (see p.3), which facilitates collecting data through household surveys. Admittedly, attending an ECE centre is a very limited approximation to actual early childhood development.[101]

b) Available data

Most regular household surveys collect the information required to construct a child school attendance indicator as well as an adult schooling indicator. The basic questions all surveys include in the household roster are whether each household member has ever attended school and, if so, which level and grade was the highest achieved; and also whether he or she is currently attending school and, if so, at which level and grade. That information, alongside age, is sufficient to compute a basic attendance and schooling achievement indicator. In fact, 95% of the reviewed surveys collect the required information to construct a child school attendance indicator and 100% collect information on adult schooling (see table 42).

However, a few details are worth noting. First, the age range over which these questions are applicable varies across countries and survey types. Some surveys complete this information for all members from 5 years old onwards, excluding the possibility of registering early childhood education. Other surveys consider the household members from 3 years old onwards for education information.[102]

Second, care must be taken regarding the way in which age is registered, how the question on attendance is phrased, and in which moment of the year has the survey been conducted. MICS and some DHS rounds have a question on attendance during current year of education and a question on attendance during the previous year of education. Frequently only one of the two questions was actually used. When age is recorded in years only (and not with the date of birth), this obviously corresponds to the time the survey was done. Additionally, surveys are performed at different times of the year across countries; yet the "official" ages for a given level of education correspond to the age of the child at the beginning of the academic year. Thus, if the question used refers to the previous academic year and age data is available

[100] The grade repetition indicator has issues. A decrease in grade repetition can signal increased efficiency and quality, but it can also be due to the adoption of automatic promotion policies (UNESCO, 2015).

[101] UNICEF (2014) has developed a multidimensional index of early childhood development using data from MICS (including health and nutrition, education and care, safety and protection).

[102] Among 17 Latin American countries, only six capture information on child school attendance from 0 years; five countries capture this information from 3 years old onwards, and one from 2 years old onwards (Villatoro, 2017a).

only in years, one year must be subtracted from the age recorded during data collection to compute the attendance indicator accurately. UIS also performs this age adjustment when the majority of observations were collected six months or more after the start of the school year (even if the question refers to the current academic year). If information is available on the birth month and year of school-age children, then age data must be recorded as the age at the start of the academic reference year.[103]

Second, for the adult schooling achievement indicator, the education levels in each country must be correctly associated with the corresponding ISCED levels, so that indicators are cross-country comparable. Third, it is more informative to have data on the highest completed levels (ISCED) of education rather than only years of schooling, and, ideally, it is useful to have both pieces of information to cross-check and validate.

As with other dimensions, the MICS surveys are at the forefront of household data collection in education. Table 39 presents the questions included in the household survey questionnaire and the additional questions included in the other questionnaires. Both question 1, which asks if household members have ever attended school, as well as questions on current and previous attendance (questions 4 and 7 , respectively) include a reference to attendance of an ECE. This is not mainstreamed in other surveys yet. Additionally, the MICS questionnaire on children 5–17 includes a module that aims at assessing foundational cognitive skills in reading and math; this is estimated to take 20 minutes.[104] However, MICS does not include a question on reasons for not attending school (used in Pakistan's MPI).

DHS and LSMS include the typical succinct set of questions (ever attended and currently attending school), and thus are not reproduced in another table. However, interestingly, DHS includes a reading skills question in the women and men's questionnaires as MICS does. The OPHI-MPPN proposed that light survey modules contain the DHS questions on education (although the applicable age range starts earlier, from 3 years old), preceded by a standard question on reading and writing. Additionally the survey includes a question on why (if so) a child is not currently attending school or pre-school and whether there are serious problems with the school (see table 40). Armenia's national MPI also includes a question on the respondent's self-assessment of the quality of the educational services received by the children.

In turn, EU-SILC questions on education vary across countries. The ones asked in the United Kingdom, presented in table 41, follow a different structure from the other surveys considered here, and in fact seem less informative and less natural to follow. Yet it is worth noting that questions are asked about household members aged 3 and up, and they include registration of ECE attendance.[105]

[103] http://uis.unesco.org/en/glossary-term/net-attendance-rate.
[104] The full questionnaire can be found at http://mics.unicef.org/tools.
[105] For example, they somehow assume that people not currently enrolled have some level of education. They combine educational level with type of school (private, public, etc.).

Table 39
Questions on education in MICS

This is completed for each household member (Household Roster) (Copy names and ages of all members of the household. Age is expressed in years.)		
1. Has [name] ever attended school or any early childhood education programme?	Yes No	
2. What is the highest level and grade or year of school [name] has ever attended?	0 ECE Primary Lower secondary Upper secondary Higher DK	Grade/year:
3. Did [name] ever complete that (grade/year)?		
4. At any time during the current school year did [name] attend school or any early childhood education programme?		
5. During this current school year, which level and grade or year is [name] attending?	Level Grade/year	
6. Is (he/she) attending a public school?	If "Yes", record "1". Govt./public Private Religious/faith org. Other DK If "No", probe to code who controls and manages the school	
(There are also questions on receiving tuition support.)		
7. At any time during the previous school year did [name] attend school or any early childhood education programme?		
8. During that previous school year, which level and grade or year did [name] attend?		
Additional questions that appear in the questionnaire on children 5–17 as well as on children under 5	***Additional questions that appear in the questionnaire on children 5–17 as well as on children under 5***	
1. In what month and year was [name] born? (Month and year must be recorded)	1. In what month and year was [name] born? (Month and year must be recorded)	
2. How old is [name]? Probe: How old was [name] at (his/her) last birthday? (Record age in completed years.)	2. How old is [name]? Probe: How old was [name] at (his/her) last birthday? (Record age in completed years.)	
Additional questions that appear in the questionnaire on children under 5	***Additional questions that appear in the questionnaire on children under 5***	
3. Has [name] ever attended any early childhood education programme, such as [insert country-specific programme names]?	3. Has [name] ever attended any early childhood education programme, such as [insert country-specific programme names]?	
4. At any time since [insert month of beginning of school year], did (he/she) attend [programmes mentioned in the preceding question]?	4. At any time since [insert month of beginning of school year], did (he/she) attend [programmes mentioned in the preceding question]?	
5. Does (he/she) currently attend [programmes mentioned in the preceding question]?	5. Does (he/she) currently attend [programmes mentioned in the preceding question]?	
6. You have mentioned that [name] has attended an early childhood education programme this school year. Does (he/she) currently attend this programme?	6. You have mentioned that [name] has attended an early childhood education programme this school year. Does (he/she) currently attend this programme?	
Additional questions that appear in the women and men's questionnaires	***Additional questions that appear in the women and men's questionnaires***	
7. Now I would like you to read this sentence to me (Show card to respondent) If respondent cannot read whole sentence: Probe: Can you read any part of the sentence to me?	7. Now I would like you to read this sentence to me (Show card to respondent) If respondent cannot read whole sentence: Probe: Can you read any part of the sentence to me?	

Source: Own elaboration.
Note: Questions 1–5 are also included in DHS (household questionnaire) and in LSMS surveys, but without reference to ECE programmes. Questions 1 and 2 are also included in the DHS questionnaires for men and women. In the questionnaire on children 5–17, questions 1–5 are repeated.
Questions 1 (without reference to early childhood education programme) and 2 are also asked in the women's questionnaire. Additionally, the questionnaire on children under on children 5–17 includes a module that aims at assessing foundational cognitive skills in reading and math; this is estimated to take 20 minutes. Question 7 is also included in DHS men and women's questionnaires.

Table 40
Questions on education in OPHI-MPPN modules

Can [name] read and write?	Yes No
Has [name] ever attended school?	Yes No
What is the highest level of school [name] has attended?	Pre-school Primary Secondary Higher DK
What is the highest grade [name] completed at this level?	
For people 3–16 years of age:	
Did [name] attend school or pre-school at any time during the (this/that) school year?	Yes No DK
(If no) Why is [name] not currently attending school or pre-school?	Too old/ too young/finished school School is too far away School is too expensive Is working Useless/uninteresting Illness Failed exam Got married or pregnant Other
Were there serious problems with the school [name] attended?	No problems (satisfied) Lack of books/supplies Poor teaching Lack of teachers Children were not safe Lack of toilets Lack of building Other facilities in bad condition Other problem (specify)

Source: Own elaboration.

Table 41
Questions on education in EU-SILC UK

(For people 3–75 years old) Is [name] currently in full time education?	
(For people 19 and over and 16–18 who are not currently in full-time education) At what age did [name] complete full-time education?	(If still in full time education: 96 If never in full time education: 97) Give an estimate if not known Age:
What type of school or college does [name] attend?	Nursery school/nursery class/ playgroup/pre-school State-run primary (including reception classes) Special school state run (for children with disabilities and special educational needs) Middle-deemed primary school (state run or assisted) Middle-deemed secondary school (state run or assisted) Secondary school (state run or assisted) Non-advanced further education/6th form/tertiary/further education college Any private independent school (prep/primary/secondary/city technology colleges) University polytechnic/any other higher education home schooling
How many hours per day does [name] usually attend school?	
At any time during the seven days ending Sunday the [Date Sunday] did [name] attend any of the places shown on this card?	Playgroup or pre-school? Day nursery or workplace crèche? Nursery School? Infant's school? Primary school? Breakfast/after-school club? Children's centre/integrated centres? None of the above

Source: Own elaboration.

Table 42
Data availability on non-monetary poverty indicators, part III – affiliation sphere indicators number of surveys considered with available information
(Percentages are over total number of surveys considered in each region)

Region	Child school attendance	Adult schooling	Employment	Social security	Health insurance
East Asia & Pacific	71(91%)	75(96%)	62(79%)	36(46%)	33 (42%)
Europe & Central Asia	401 (99%)	404(100%)	393(97%)	399(98%)	9 (2%)
Latin America & Caribbean	245 (100%)	245(100%)	220(89%)	178(100%)	188 (77%)
Middle East and North Asia	130 (81%)	245(100%)	103(70%)	15(12%)	23 (18%)
South Asia	27 (100%)	130(82%)	21(77%)	5(18%)	15 (50%)
Total	874 (95%)	874 (100%)	797(85%)	633(78%)	267 (30%)

Source: Own elaboration based on DAPI.

c) Discussion and recommendations

School attendance and adult schooling achievement of the household are basic pieces of information that need to be included among indicators of non-monetary poverty. For the attendance indicator a key issue is to define the age range used for computation. One natural option is to define an age range that covers the mandatory education in the country. The ages corresponding to primary and lower secondary school are now typically covered. The question is whether to extend this age range to include one or more years of pre-primary school education and to include upper secondary school.

Using a lower lower-age bound for the attendance indicator (4–17 rather than 6–17) in 15 Latin American countries increases the average deprivation rate from about 8% to 12% in urban areas, and from about 18% to about 24% in rural ones (Villatoro 2017a). The increment is higher among the poorest quintiles. Also, there is evidence that children who start school late are more likely to drop out before they complete their education; moreover, this problem has greater effect on disadvantaged children (UNESCO, 2012). This evidence, alongside the importance placed in SDG 4 on early childhood education, favours the extension of the attendance indicator to cover at least one year of pre-primary education and possibly two, but this needs to be in accordance with national laws to have full enforcement and meaningfulness. Collecting data on early school attendance requires only a very simple adjustment to current household surveys.

In terms of the upper-age bound, middle-income countries seem to be adopting the standard of extending the attendance indicator up to 16 years at least, and some to even 17 or more – a reasonable practice in view of SDG 4. However, if national laws do not require upper secondary school attendance, such an age requirement may be too demanding. At the very minimum, the age interval needs extend up to the necessary age of completion for lower secondary education.

Given that education is a human right, the definition that if *at least one child* in the defined age range is not attending school, the household is considered deprived is a desirable practice.

For the adult schooling achievement indicator, standards and educational laws have evolved significantly in the last 20 years. Thus, requiring a complete upper secondary education for the younger generation, a complete lower secondary for middle-aged people, primary education for older individuals, and literacy for the eldest seems to be in line with SDG 4 and the prevailing standards in many countries. However, if this was too demanding to certain national contexts, it can be adapted.

Defining the household-level indicator requires determining whether a union, intersection or intermediate criterion will be followed. While the global MPI has followed an intersection criterion (and used a very mild requirement of five years of education), national MPIs in Latin America have most frequently used a union criteiron, defining a household as deprived whenever any member has not completed his or her corresponding education level. This signals a clear interest at the country level in enforcing educational standards as much as possible, and thus it would be counterintuitive to suggest less. However, again, if a union criterion was too demanding in certain national contexts, it can be adapted.

Admittedly, there are educational externalities within the household (Basu and Foster, 1998) that may support a milder requirement.

There are two further improvements on which progress is already being made and which can be scaled up in the near future: exploring whether a compact survey instrument could be incorporated in regular surveys on (a) early childhood care and (b) fundamental cognitive skills. The data analysis and experience of the most recent round of MICS will offer advice on both matters. Most likely, however, both MICS instruments, especially the one to assess cognitive skills, will require a substantial abridgement and include only the very core literacy and numeracy functions.[106]

B. The employment and social protection dimension

The dimension of employment and social protection is quite broad and multidimensional in itself. While each of these two themes can be addressed separately, there are very strong links between them that favour a joint treatment.

The right to (quality) employment and social security has been recognised since the Universal Declaration of Human Rights (UDHR) (UN, 1948, art. 23 and 24 for employment, 22 and 25 for social security), and they have been reaffirmed in several subsequent conventions.[107] Minimum standards have been delimited in the Social Protection Floors Recommendation (ILO, 2012).

The relevance of employment goes beyond its (potential) enabling power to provide an adequate standard of living, it is also an important means of social integration; it prevents isolation from society's prevailing lifestyle and culture (Atkinson et al., 2002, p. 137).

The concept of decent work, officially introduced by the International Labour Office (ILO) in 1999, in essence reaffirms what was already stated in the UDHR in 1948. "Decent work means productive work in which rights are protected, which generates an adequate income, with adequate social protection. It also means sufficient work, in the sense that all should have full access to income-earning opportunities" (ILO, 1999). Decent work has four pillars: (1) international labour standards and fundamental principles and rights at work, (2) employment creation, (3) social protection, and (4) social dialogue and tripartism (employers, employees and government).

Social protection or social security is one of the pillars of decent work. The ILO (2017) defines social protection as the set of policies and programmes designed to reduce and prevent poverty and vulnerability *throughout the life cycle*. It includes contributory schemes (social insurance) and non-contributory tax-financed benefits for (1) children and families, (2) maternity, (3) social assistance (income poor), (4) unemployment, (5) employment-related injury and illness, (6) old age, (7) disability, as well as (8) health protection. "Social security provisions are essentially supplementations of the processes of market exchange and production" (Sen, 1981).

The MDGs included several employment-related indicators (in Goal 3 and Goal 8, and in complementary indicators).[108] Social security was not mentioned as such in the MDGs, but it was obviously instrumental to them. As with other goals, the SDGs have expanded the inclusion of goals related to decent work and social security. Goal 8 addresses the achievement of productive employment and decent work for all. Some particularly relevant Targets are Target 8.5 (productive employment and decent work for all women and men), 8.6 (reduce the proportion of youth not in employment, education or training), 8.7 (eradicate forced labour, modern slavery, human trafficking and the worst forms of child labour) and 8.8 (protect labour rights and promote safe and secure working environments for all workers).

[106] Delimiting the age range over which cognitive skills will be assessed is an additional non-trivial decision.

[107] International Covenant of Economic, Social and Cultural Rights, (UN, 1966, arts. 6 and 7 for work; arts. 9 and 11 for social security); the Convention on the Elimination of all Forms of Discrimination against Women (UN, 1979, arts. 11 and 14); the Convention on the Rights of the Child (UN, 1989, arts. 26 and 27); and the Convention on the Rights of Persons with Disabilities (UN, 2006, art. 28).

[108] These were the share of women in wage employment in the non-agricultural sector (Goal 3) and the unemployment rate of young people aged 15–24 years (Goal 8). Additional indicators were the employment-to-population-of-working-age ratio, the unemployment rate, and informal sector employment as a percentage of employment.

Social protection is the focus of Target 1.3 ("implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable"). It is also instrumental to Target 2.2 (nutrition) and Goal 10 (reducing inequality). Decent work is also part of Target 2.3 (increasing opportunities for non-farm employment) and Target 5.4 (recognising unpaid care and domestic work). Finally, social protection is also related to Target 3.8's goal of achieving universal health coverage, but this is discussed separately in section II.C. More broadly, expanding decent work and social protection will contribute directly or indirectly to virtually all SDGs (ILO, 2017, p. 3; UNDP, 2017, p.10).

Decent work and many aspects of social protection are not only instruments for reducing monetary poverty (World Bank, 2015; ILO, 2015; UNDP, 2017), but they are also increasingly understood as constituent elements of multidimensional poverty. Many deprivations in decent work and social security, such as not finding a job, not having access to needed health care or paid vacation, are functionings failures that – within a capability perspective – can be signs of poverty.

For example, since 2001, the Europe 2020 poverty reduction target includes in its definition of the target population a (quasi-)jobless household indicator (Social Protection Committee [SPC] Indicators Sub-Group, 2015).[109] This indicator is included in the MPI-EU by Alkire and Apablaza (2016). The global MPI does not include indicators of employment or social protection. This is essentially due to the reality that data sources with information from the other global MPI indicators −indicators that were undeniably relevant and necessary for a measure of *acute* poverty− included very limited or no information on employment and social protection.

The MPI-LA does include an indicator for employment and one for social protection that also includes access to health care (Santos et al., 2015). Twelve of the 18 national MPIs also include indicators for employment and social security (figure 1), which suggests that deprivation in these dimensions is increasingly seen as a potential sign of poverty.

On the one hand, unemployment would not be so harmful if there was a good social protection scheme in place. Yet social security coverage is still very far from being universal: only 45% of the world's population are effectively protected by a social protection system in at least one area, and only 29% have access to comprehensive social protection systems (ILO, 2017). On the other hand, being employed is obviously no guarantee of escaping poverty. Labour market segmentation translates into the poor accessing precarious jobs with non-existent or deficient social protection (Kaztman, 2010); every year 17 million people join vulnerable forms of employment (ILO, 2018). In-work poverty is a problem that is monitored worldwide and is present both in developing and developed countries.[110]

These arguments – just a few highlights of an extensive body of research on poverty, employment conditions and social security – reaffirm the importance of including a few core indicators of deprivation in decent work among the multidimensional poverty indicators. However, the selection social protection indicators to be included in an MPI must be made carefully to avoid a tautological problem: receiving social assistance does not prevent a person from being poor both ex-ante and ex-post (the transfers usually are of very little size in developing countries) and receiving an unemployment benefit does not eradicate the functioning failure of not being able to work. Thus, certain social protection indicators are not suitable for inclusion in an MPI.

1. Indicators and standards

Both decent work and social security encompass a wide range of aspects. However, including too many indicators in this dimension has at least two disadvantages in this context: (1) it may be difficult or impossible to implement a measure with so many indicators widely across developing countries due to

[109] The Europe 2020 poverty reduction target is the population that meets any of three criteria: (a) being below the 60% income threshold, (b) being deprived in four or more items, or (c) people 0–59 years of age living in a (quasi-) jobless household, defined as households where the working age members worked less than 20% of their total potential during the previous 12 months (SPC Indicators Sub-Group, 2015; Eurostat, 2017).

[110] See for example Atkinson et al. (2002), ILO (2018); Tripney et al. (2009), Horemans, Marx and Nolan, (2014).

data constraints, and (2) such a measure may fall beyond the scope of assessing and monitoring key aspects of multidimensional poverty.

Table 43 presents the *aspects* (not the precise indicator definitions) of deprivation in decent work and social security that have been included in national MPIs so far, as well as in Europe 2020's poverty and social exclusion reduction targets. It also indicates links to various SDG indicators, to OECD's (2014) quality of work concept, and to Eurostat (2017) indicators for the SDGs. The organisation of the table borrows from Glebjerman (2017) and ILO (2003, 2017).

The table shows that two aspects that stand out as being most frequently included in national MPI indicators are (1) being unemployed or in long-term unemployment (Europe, 11 national MPIs [nine official] and the MPI-LA include it, and it has been recommended as a level 1 indicator by Atkinson et al., 2002) and (2) not contributing to a pension system (included in nine official national MPIs), which is most frequently used as a proxy for informal employment. Other included aspects are being employed below the minimum wage (in five national MPIs), child labour (in five national MPIs), and people of retirement age who do not receive a pension (in four national MPIs and in MPI-LA).

Less frequently covered aspects are time-underemployment (being a part-time worker involuntarily), being employed without a pay, working an excessive number of hours, being an independent informal worker (although many of these people can be captured if the aspect related to pension system contributions is included), not being entitled to paid vacation and other employment benefits, not having health coverage (but again, this may be included in a general health-care access indicator), being in a short-term contract, being a discouraged worker, and young people not in employment or in education or training.

The issue of child labour deserves a special comment. While child labour should be abolished (ILO, UNICEF, children's right No 32), its existence might be deemed essential to the survival of the household by some parents (Basu and Van, 1998). The eradication of child labour is not straightforward; sometimes, well-intentioned policy interventions might actually have undesirable side effects (debilitating intra-household cohesion, stigma, more domestic work, increased gender gap, and even more poverty) (Basu and Tzannatos, 2003 and references therein; Noceti, 2016; Piza, 2012). In fact, "international standards on child labour allow for exceptions to general prohibitions (…). There can therefore be no uniform legal definition of child labour for universal application." (ILO, 2008, p. 57).[111] There are also issues of misreporting of child labour in household surveys. Thus, an accurate assessment of the problem of child labour requires advancing much more on international consensus on the standard to be used, and on survey instruments that accurately capture the required data. This falls beyond the scope of this study.

In turn, the social security aspects typically covered are being a contributor to the pension system (for working-age people) or rather receiving a pension (for people in retirement age), and having health coverage (treated in section II.3) Developed social security systems also include transfers to different vulnerable groups: children, the unemployed, and the disabled.[112] [113] Only two countries include access to some of these in their national MPIs: Costa Rica includes whether disabled people are receiving some income transfer, and Ecuador whether the unemployed are receiving unemployment insurance. As clarified above, the inclusion of some indicators of access to social protection in an MPI is at risk of being tautological, and thus, it is debatable. First, note that the income perceived in transfers is already considered in the identification of monetary poverty. Second, the transfers compensate but do not eliminate the functioning failure. These indicators are important to monitor the performance and coverage of the social protection system, but it does not seem sensible to use them to identify the poor.[114]

[111] Two key elements for the measurement of child labour are the age of the child and the precise activity she or he performs (ILO, 2008).

[112] "National social protection floors should (…) include at least: (1) access to essential health care, including maternity care; (2) basic income security for children; (3) basic income security for persons of working age who are unable to earn sufficient income, in particular in cases of sickness, unemployment, maternity and disability and (4) basic income security for older persons" (ILO, 2017, p. 195).

[113] Non-contributory cash transfer programmes, especially conditional cash transfer programmes (CCT), pioneered by Mexico in the 1990s, spread rapidly throughout the world. About 130 countries now have at least one of such cash transfer programmes (ILO, 2017).

[114] However, the case of disability transfer is different from unemployment benefits. The first is, in general, a permanent income that compensates for an irreversible condition. The second, instead, is a temporary transfer due to a state that should be overcome.

Thus, the first step is to delimit the aspects of decent work and social security to be included among non-monetary indicators of poverty. Next, for each aspect to be considered, a deprivation threshold must be defined at the individual level. While the ILO provides international employment definitions, summarised in box 1,[115] there is still scope for quite a bit of heterogeneity and some definitions are actually somehow inconsistent with the notion of decent work.

Specifically, the definition of "applicable population" for each indicator and the reference period used still result in variations across countries. Most countries consider the working-age population to be 15–65 years of age. For developed countries, Atkinson et al. (2002) suggest setting the age range at 18–59 and excluding people aged 18–24 who are in full-time education (and inactive). However, the interval seems a bit narrow for developing countries. While the age requirement for compulsory schooling is increasing, it does not reach age 17 in all developing countries. Also, many countries are actually postponing the mandatory retirement age due to increased life expectancy.

In terms of the reference period, the ILO typically relies on a seven-day period for determining employment and a four-week period for defining unemployment, but again, this varies across countries. Anderson Schaffner (2000) recommends using the previous week *and* a 12-month reference period, but with less ambitious questions regarding the 12-month period. In general, shorter reference periods tend to elicit more accurate responses. However, if the aim is to capture access to employment and, especially, to something close to "decent work", the one-week reference period can be misleading. Of course, one possibility is to complement this information with information on informal employment. These issues confirm that a consensus about minimum employment standards that are also compatible with the notion of decent work is yet to be reached. In addition, the reference period to capture those minimum standards must be made uniform.

Once those challenges are sorted, if the indicator is to be integrated into an MPI with the household as the unit of identification, the next step is to define a household-level indicator. On this matter, there is yet no international standard. One initial difficulty is that it is common to combine different categories into one indicator at the household level. For example, Costa Rica combines long-term unemployment with discouraged workers (having at least one household member in any of these two categories), and Ecuador combines unemployed household members with those in "inadequate employment". Panama combines unemployment with having an unpaid family worker or potentially active member. The MPI-LA's employment indicator was defined as households with at least one member between the ages of 15 and 65 being unemployed, employed without pay or a discouraged worker. Some countries, such as Honduras, even combine an unemployment aspect and a social security aspect into the same indicator: having an employed person who is not contributing to a pension system or having someone unemployed makes the household deprived.

Another important issue when defining a household-level indicator is whether to use a union, intersection or intermediate criterion. So far, most national MPIs use a union criterion for the employment and social security indicators. Exceptions are the Dominican Republic's MPI on "household livelihood", which requires no member aged 18 years or above to be employed, but the labour informality indicator uses a union criterion. An example of an intersection criterion is the quasi-"jobless household" indicator used in the Europe 2020 poverty reduction target (that *all* working-age people in household worked less than 20% of their total potential) (SPC Indicators Sub-Group, 2015).

[115] Note that Indicator 8.3.1 (proportion of informal employment in non-agricultural employment, by sex) is Tier II, and Indicator 8.5.2 (unemployment rate, by sex, age and persons with disabilities) and 8.6.1 (proportion of youth [aged 15–24 years] not in education, employment or training) are Tier I.

Table 43
Aspects of decent work and social security that have been included in indicators of non-monetary poverty

Aspect		Included in....	Linked to...
Aspects of decent work			
People in the labour force			
Being unemployed	Unemployed	EU- SPC Indicators Sub-Group; Glebjerman (2017); national MPIs of Ecuador, Panama, Honduras, El Salvador, Chile, Dominican Republic, Moldova, South Africa; MPI-LA; MPI-EU	SDG Ind. 8.5.2, OECD (2014), Eurostat (2017), Atkinson et al. (2002)
	Long-term unemployed (12 months or more)	Glebjerman (2017); national MPIs of Costa Rica, Colombia, Armenia	OECD (2014), Eurostat (2017), Atkinson et al. (2002)
Various forms of informal work (ILO, 2003)	Involuntarily a part-time worker	Glebjerman (2017); national MPIs of El Salvador, Armenia, Moldova	Atkinson et al. (2002)
	Below minimum wage employment	Glebjerman (2017); national MPIs of Costa Rica, Panama, Honduras, El Salvador, Ecuador.	SDG Ind. 8.5.1, OECD (2014)
	Being employed without a pay	Glebjerman (2017); national MPIs of Panama, Armenia; MPI-LA	
	Excess number of hours of work	Glebjerman (2017)	OECD (2014)
	Independent informal worker (enterprise is in the informal sector)	Glebjerman (2017); national MPIs of Costa Rica, Armenia, Moldova	
	Not contributing to pension system	Glebjerman (2017); national MPIs of Costa Rica, Panama, Ecuador, Honduras, El Salvador, Mexico, Chile, Dominican Republic, Colombia; MPI-LA	
	Not entitled to paid vacation and/or sick leave, and/or advanced notice of dismissal	Glebjerman (2017), Costa Rica MPI	
	Not entitled to health coverage	National MPIs of Mexico, Colombia, El Salvador; MPI-LA	SDG Ind. 3.8.1
	Short-term or seasonal contract or no right to advanced notice of dismissal	National MPI of El Salvador, Armenia.	Eurostat (2017)
Unsafe work		Glebjerman (2017)	SDG Ind. 8.8.1, OECD (2014)
People outside the labour force			
Discouraged worker		Glebjerman (2017); national MPIs of Costa Rica, Panama;* MPI-LA	Atkinson et al. (2002)
Inactivity due to caring responsibilities		Costa Rica's MPI*	SDG Ind. 5.4.1, Eurostat (2017)
Less than half of working-age household members are not in the labour force		National MPIs of Armenia and Moldova	
Young people neither in employment nor in education and training		Glebjerman (2017)	SDG Ind. 8.6.1, Eurostat (2017)
People with work to be abolished			
Child labour		Glebjerman (2017); national MPIs of Ecuador, Honduras, El Salvador, Dominican Republic, Colombia.	SDG Ind. 8.7.1
Aspects of social security**			
People of retirement age not receiving a pension		National MPIs of Costa Rica, Ecuador, Mexico, Chile, Vietnam; MPI-LA	SDG Ind. 1.3.1
Disabled people not receiving any transfer		National MPI of Costa Rica	SDG Ind. 1.3.1
Unemployed people not receiving unemployment insurance		National MPI of Ecuador	

Source: Own elaboration based on the sources cited in the table.
Notes: Ind.: Indicator. *Panama includes in one of the employment deprivation indicators people aged 18 and above who are not in the economically active labour force but "are ready to work", among whom there may be discouraged workers. Costa Rica considers as deprived people who are outside the labour force "because of family duties", most likely women who act as caretakers for children and elderly household members. **Access to health insurance/coverage is part of social security but it is treated separately in section II.3.

Box 1
Some basic ILO definitions

Working-age population

All persons above a specified minimum age threshold for which an inquiry on economic activity is made. While no international standard on age limits exists, most commonly, the working-age population is defined as persons aged 15 years and older, but this varies from country to country. Some countries also apply an upper age limit (which tends to coincide with the mandatory retirement age) (ILO 2013, p. 29).

Employed

All persons of working age who, during a specified short period of either one week or one day, were in the following categories:

(a) paid employment
- (a1) at work: persons who, during the reference period, performed some work (i.e. at least one hour) for wage or salary, in cash or in kind;
- (a2) with a job but not at work: persons who, having already worked in their present job, were temporarily not at work during the reference period and had a formal attachment to their job;

(b) self-employment
- (b1) at work: persons who, during the reference period, performed some work (i.e. at least one hour) for profit or family gain, in cash or in kind;
- (b2) with an enterprise but not at work: persons with an enterprise (which may be a business enterprise, a farm or a service undertaking) who were temporarily not at work during the reference period for any specific reason.

Unemployed

All persons of working age who were (1) without work during the reference period, i.e. were not in paid employment or self-employment; (2) currently available for work, i.e. were available for paid employment or self-employment during the reference period; and (3) seeking work, i.e. had taken specific steps in a specified recent period to seek paid employment or self- employment.

For purposes of international comparability, the period of job search is often defined as the preceding four weeks, but this varies from country to country (ILO, 2013, p.30).(Some countries have recently changed the reference period to the previous week.) (Details on the definition of paid employment and self- employment can be found in ILO, 1982.)

In long-term unemployment

Persons who have been unemployed for the previous 12 months or more (ILO, 2016).

Time-related underemployment

All persons in employment (as defined by the 13th International Conference of Labour Statisticians) who, during the reference period used to define employment, were (1) willing to work additional hours, (2) were available to work additional hours and (3) whose hours actually worked in all jobs during the reference period were below a threshold to be determined according to national circumstances. To consider a person as being time-related underemployment, all three criteria must be satisfied simultaneously (ILO, 2007, p. 18).

Discouraged worker

There is no official international definition. However, it is most commonly defined as persons who are without work and are available for work who give specific reasons related to their discouragement for not seeking work in the recent past (e.g., that there were no jobs available, there were none for which they would qualify, or they had given up hope of finding employment).

In addition to the criteria stated above, some best practices suggest adding two additional criteria to define discouraged workers: (1) a “desire for work” (or “willingness to work”) and (2) an active job search at some time in the past over a long period, for example, at some time over the last year excluding the last four weeks (ILO 2013, p. 36).

Informal employment (from ILO, 2003, Point 3)

Comprises the total number of informal jobs, whether carried out in formal sector enterprises, informal sector enterprises, or households, during a given reference period. Informal employment includes the following types of jobs:
- (i) own-account workers employed in their own informal sector enterprises;
- (ii) employers employed in their own informal sector enterprises;
- (iii) contributing family workers, irrespective of whether they work in formal or informal sector enterprises;
- (iv) members of informal producers’ cooperatives;
- (v) employees holding informal jobs (as defined below) in formal sector enterprises, informal sector enterprises, or as paid domestic workers employed by households;
- (vi) own-account workers engaged in the production of goods exclusively for own final use by their household, if considered employed.

Employees are considered to have informal jobs if their employment relationship is, in law or in practice, not subject to national labour legislation, income taxation, social protection or entitlement to certain employment benefits (advance notice of dismissal, severance pay, paid annual or sick leave, etc.). The operational criteria for defining informal jobs of employees are to be determined in accordance with national circumstances and data availability.

Youth not in employment, education or training, 15–24 years

Youth not in employment, education or training (NEET). It provides a broader measure of potential youth labour market entrants than youth unemployment. It includes discouraged worker youth as well as those who are economically inactive due to disability and engagement in household chores, among other reasons. NEET is also a better measure of the current universe of potential youth labour market entrants as compared with the youth inactivity rate, as the latter includes those youth who are not in the labour force and are in education, and thus cannot be considered currently available for work (ILO, 2013, p.38).(Atkinson et al., 2002, p.131 suggested the age range 18–24 instead.)

Source: Own elaboration.

2. Data availability

All regular national household surveys include a significant module on employment (and typically also income or consumption). The most common of which are the ILO's Labour Force Surveys and LSMS surveys. LSMS recommended modules (Grosh and Glewwe, 2000, vol. 3, module for ch. 9) include three versions of an employment module: a short one, a standard one (which is similar to the ones used in most Latin American countries) and an extended one. Even the short one is quite extensive. Within the short module, there is a set of questions that are recommended as essential core questions for multi-topic surveys. These are detailed in table 44. Then , table 45 presents three questions related to social security that are included in the transfers and non-labour income module proposed in the LSMS (Grosh and Glewwe, 2000, vol. 3, module for ch. 11).

DHS and MICS are multi-topic surveys that do not focus on the labour force. DHS contains a succinct set of employment questions that are only applicable to men and women of reproductive age and which do not allow identifying unemployment. DHS has no question on social security. MICS, in turn, contains a few core questions on social security benefits (similar to those in table 45) but no employment questions. The OPHI-MPPN light survey modules include a module on employment and social security (table 46) which is a very interesting compromise. The EU-SILC surveys contain quite detailed information on employment (occupational status, underemployment, occupation type), employment benefits and social transfers.

Table 47 summarises the employment and social security aspects that have been or could be included in non-monetary indicators of poverty (detailed in table 43) that are covered in the different surveys mentioned. Except for MICS, all surveys collect information to determine employment and, all except DHS, to determine unemployment and long-term unemployment. This is also reflected in table 42, where it can be seen that 85% of analysed surveys offer some information on employment (but this includes the limited information that DHS surveys offer). One point worth noting is that LSMS uses both a seven-day and 12-month period for the question on having worked, and a seven-day reference period for looking for work; DHS and EU-SILC UK also use the seven-day reference period, but the OPHI-MPPN modules use a one-month reference period for both the have worked question and the have been looking for a job question.

Time-related underemployment (which requires asking whether the person would like to work more hours or is looking for another job) is not frequently captured in brief employment modules, although it is obviously captured in the standard LSMS. Employment that is compensated at a rate below the minimum wage is captured whenever questions on hourly earnings are included, but this is not the case in the short modules in DHS or OPHI-MPPN. Capturing seasonal contracts (or other forms of precarious employment contracts) also requires more extensive employment modules. Importantly, employment benefits (paid vacation, sick leave, etc.) and contributions to a pension system are captured in the LSMS standard module but also in OPHI-MPPN modules, which are more succinct. Work safety is typically not covered. The OPHI-MPPN module contains a few questions that allow capturing extreme working conditions as well as injuries at work. The discouraged worker problem and presence of "potentially active people" – relevant in terms of gender issues – are not usually covered, but this can be amended easily by adding the required response categories for the question on why the person is not looking for a job. Finally, while in table 42 one sees that 78% of analysed surveys offer some information on social security, this is typically restricted to the contribution to and/or perception of the retirement pension system, which is obviously fundamental information. Coverage of other components of social security is usually incomplete. This can be included relatively easily in the household roster, in line with MICS.

Table 44
Suggested core employment questions in LSMS surveys

1. During the past seven days, have you worked for someone who is not a member of your household, for example, an enterprise, company, the government or any other individual?	Yes (go to 3) No
2. At any time during the last 12 months, have you worked for anyone who is not a member of your household?	Yes No
3. During the past seven days, have you worked on a farm owned or rented by a member of your household, either in cultivating crops or in other farming tasks, or have cared for livestock belonging to a member of your household?	Yes (go to 5) No
4. At any time during the last 12 months have you worked on a farm owned by a member of your household, or have cared for livestock belonging to a member of your household?	Yes No
5. During the past seven days, have you worked on your own account or in a business enterprise belonging to you or someone in your household, for example, as a trader, shop-keeper, barber, dressmaker, carpenter or taxi-driver?	Yes No
6. At any time during the last 12 months did you work on your own account or in a business enterprise belonging to you or someone in your household?	Yes No
Check the answers to questions 2, 4 and 6 (worked in last seven days). Yes (go to 11) No	
7. Do you have a permanent job even though you did not work in the last seven days?	Yes No (go to 9)
8. What is the main reason that you did not work in the last seven days? Sick Maternity Household Member Vacation Strike/suspension Temporary work load reduction Other (specify)	
9. Have you looked for work in the last seven days?	Yes (end) No
10. What is the main reason you did not look for a job in the last seven days? (Most important reason) Student Housewife/childcare Too old/retired Handicapped Waiting for reply from employer Waiting for recall by employer Waiting for busy season Other (specify)	
Check answers to questions 3, 5 and 7 (worked in the last 12 months)	Yes (cont.) No
I would like to ask you some questions about the work you did in the last seven days and the last 12 months, whether on your own account or for someone else. Let's start with the work you did in the past seven days. If you did not work in the last seven days but you had a permanent job, please describe your permanent job. If you did not have a job during the past seven days, describe the work you did in the past 12 months.	
11. What did you do?	Written description Occup. code
12. What kind of trade or business is it connected with?	Written description Industry code
13. For how many days in the last seven days did you do this work, for any employer?	Days per week
14. For how many hours in the last seven days did you do this work?	Hours per week
15. For how many weeks in the last 12 months did you do this work?	Weeks per year
16. During these weeks, how many hours per week did you usually do this work?	Hours per week
17. In this work, were you (read all responses): An employer? A worker on own account or unpaid worker in a household farm or nonfarm business enterprise? A paid worker on a household farm or in nonfarm business enterprise? An employee of someone who is not a member of your household?	

Table 44 (Concluded)

18. Is your employer for this work... (read all responses) A private company, enterprise or cooperative? Rural public works program? The government, public sector or army? A state-owned enterprise? A private individual?	
19. Is this job covered by a collective bargaining agreement?	Yes/No
20. Did you receive wages, salary or other payments either in cash or in other forms from this employer for this work?	Yes/No
21. What is the main reason you received no payments for this work? Apprenticeship or unpaid traineeship Labour exchange Paying of debt Other (specify)	
22. How much was your last payment? What period of time did this payment cover?	Amount: Time unit:
23. How many hours did you work for the pay you just reported? (Please include any hours of paid vacation or sick leave)	Hours
24. Are any income, social security or worker's compensation taxes deducted from your pay?	Yes/No
25. Did you receive any additional payments in the form of tips, gratuities, bonuses, food, clothing, housing or transportation in this work?	Yes/No
26. What was the value of those payments? Over what time interval?	Amount: Time unit:
27. Is this the only employer for whom you did this work in the last 12 months?	Yes/No
28. During the last 12 months, for how many weeks did you work for this employer?	Weeks per year
29. During the weeks you worked for this employer in the last 12 months, how many days did you usually work per week?	Days per week

Source: Grosh and Glewwe (2000), vol. 1 (ch. 6) and vol. 3.
Note: The reference to crops and farming tasks is obviously not applicable to urban areas but such examples can be excluded from the questions or replaced for other relevant ones. Questions 11–29 are asked about both primary and secondary jobs.

Table 45
Questions related to social security in the transfers and non-labour income module of LSMS

In the last 12 months, has any member of your household received any payment from the following sources?	State pension Company or private pension Survivor's pension Unemployment benefit Illness or disability payments Job search programs Maternity payments Child allowances Social assistance payment
Who is the member of your household who received income from this source?	(List all members)
How much did [name] receive from this source in the past month?	

Source: Own elaboration.

Table 46
Employment and social security questions in OPHI-MPPN questionnaires
(included both in men and women's questionnaires)

1. Did you do any type of work for pay in the last four weeks – including informal or self- employed work?		Yes/No			
2. Were you absent from work in last four weeks?		Yes/No			
3. Have you been looking for work and ready for work in the last four weeks?		Yes/No			
4. What was the main reason for not working in the last four weeks and not looking for work?		No work available ..... Seasonal inactivity ..... Student ..... Household/family duties ..... Too old/too young..... Infirmity ..... Other.....			
5. How many jobs did you have in the last one year? Please list job codes in order of time spent doing each, i.e. primary job as job 1 (See occupation codes.)		Description Occupation code	Description Occupation code	Description Occupation code	Description Occupation code
6. During which months did you work on this job during the past one year? Yes ..... 1 No ..... 2 Ask for each month Occupation codes may be revised to include care. Occupation codes must distinguish socio-economic strata insofar as is possible.		**Job 1**	**Job 2**	**Job 3**	**Job 4**
	January				
	February				
	March				
	April				
	May				
	June				
	July				
	August				
	September				
	October				
	November				
	December				
7. How many hours per week did you work on average in the last month? Number of hours		**Job 1**	**Job 2**	**Job 3**	**Job 4**
8. Did you work relatively more or less than usual in the last month?		More than usual Same as usual Less than usual			
9. How were you paid for the main job you worked at during the last year (i.e. job 1)?		Wages/salary ..... 1 Payment in kind ..... 2 Casual (hourly/daily)..... 3 Unpaid or volunteer ..... 4 Self-employed..... 5			
10. For whom did you work for in your main job?		Government..... 1 Parastatal..... 2 Private business..... 3 Private person/household ..... 4 Other (specify)..... 77			
11. What is the main activity at the place of your main job?		Agriculture ..... 1 Mining/quarrying..... 2 Manufacturing/processing ..... 3 Construction ..... 4 Transport ..... 5 Trade/Selling..... 6 Education/health ..... 7 Administration ..... 8 Miscellaneous services ..... 9 Other (specify)..... 77			

Table 46 (Concluded)

12. Are you entitled to the following? Yes / No / N/A / DK	Paid sick leave Paid holiday Maternity/paternity leave Retirement pension Social security benefits Health insurance/free medical care
13. Have you suffered any accidental injury, illness, disability or other physical or mental health problem caused by work during the past 12 months?	Yes No DK
14. Did any of these incidents lead to a loss of work for one or more days?	Yes No DK
15. The most serious incident had	No permanent effect ..... 1 A permanent effect, but you're able to carry on with the same job ..... 2 A permanent effect, but you're able to work, although not in the same job ..... 3 A permanent effect that prevents you from working at all ..... 4 N/A..... 66 Don't know 98

Source: Own elaboration.

Table 47
Coverage of employment aspects addressed in non-monetary indicators of poverty in different household surveys

	LSMS core questions	LSMS short version	LSMS standard version	LSMS extended version	DHS	MICS	OPHI-MPPN	EU-SILC
Employment aspects								
Employment	√	√	√	√	√	X	√	√
Employment status (employed; self-employed)	√	√	√	√	X	X	X	√
Occupation type (code)	√	√	√	√	√	X	√	√
Unemployment	√	√	√	√	X	X	√	√
Long-term unemployment	√	√	√	√	X	X	√	√
Time-related underemployment	X**	X	√	√	X	X	X	√
Below the minimum wage	√	√	√	√	X	X	X	√
Employed without a pay	√	√	√	√	√	X	√	√
Short term/seasonal contract	X	X	X	√	X	X	√	√
Access to employment benefits (paid vacation, sick leave, advanced notice of dismissal, health benefits)	X	√***	√	√	X	X	√	√
Contributing to pension system	X***	√***	√	√	X	X	√	√
Work safety	X	X	X	X	X	X	√	X
Discouraged worker	X*	X*	X*	X*	X	X	X	X*
Youth not in employment nor in education	√	√	√	√	√	X	√	√
Potentially active people****	X	X	X	X	X	X	X	√
Social security aspects								
Receiving of some kind of public transfer	NA	√ (transfers and non-labour income module)			X	√	X	√
Receiving a retirement pension	X		X		X	√	X	√
Is part of a public work program or training	√	√	√	√	X	X	X	√

Source: Own elaboration based on the questionnaires in the surveys mentioned in the table. The reference period used in EU-SILC UK is the previous week.

* They have the question on why someone is not looking for work, to which reasons related to discouragement could be added.** Several questions on hours, days and weeks of work are asked but there is no question on willingness and availability to work more hours.*** The question is quite general ("entitled to benefits of social security program") and does not really discriminate between the pension system and other social security benefits, but it can be made more precise or explicit.**** Note that to capture "potentially active people" it is necessary to ask a couple of questions of this type (included in EU-SILC UK): (1) "Even though you were not looking for work in the [reference period], would you like to have a regular paid job at the moment, either a full- or part-time job?" and (2) "Are you prevented from seeking work by any of the following? Disability or illness; caring for a disabled or elderly person; having to look after child(ren); None of these".

3. Discussion and recommendations

Combining existing practices with data availability, the following recommendations are made for employment and social security indicators of non-monetary poverty.

(1) Include an unemployment indicator, as a complete lack of work is an extreme situation (ILO, 2007) that disables a person's access to labour income, which is the main income source in developing countries and among vulnerable populations in any country. Considering *only* long-term unemployment can be a too conservative option.[116]Data on unemployment is readily available in most prevalent surveys, although admittedly with a very undemanding definition for those considered "employed". Both the working-age population and the reference period should be harmonised across countries to preserve comparability.

(2) Whenever possible, combine the unemployment indicator with the presence of discouraged workers and workers with no pay. Discouraged workers constitute an invisible form of unemployment, and this can be captured relatively easily by adding the required response categories into an already quite mainstream question. Data on workers with no pay is also available.

(3) Include contributing to a pension system (for employed people – both employed and self-employed), as it is a key element of informal labour (as well as a predictor of poverty in old age) that is typically included in standard employment modules, and even in shorter ones such as OPHI-MPPN modules. It is important to also include here self-employed people. Access to other employment benefits should also be considered, especially in view of the undemanding employment definition. Data is generally available or can be relatively easily collected (with a question like no. 12 in table 46).

(4) Include whether people of retirement age are receiving retirement pensions, as this is one fundamental floor of social security systems. While the receipt of transfers to other vulnerable groups (unemployed, disabled, children, pregnant women) may not be included in MPIs, these data should still be collected, and indicators computed for an accurate monitoring of the social protection system. Data collection on these aspects is being increasingly included in surveys. This can be done with some further questions in the household questionnaire, even included in the household roster.

(5) For clarity and transparency of the measures, **aspects of employment and social protection should be grouped into homogeneous categories** that can inform policy, especially when breaking down MPIs by dimensions and indicators. Thus, for example, whether there is at least one member in the household who is unemployed, a discouraged worker or a worker without a pay, are all aspects of essentially the same problem. Aspects of labour informality should be captured in a separate indicator.

(6) Countries may start with a conservative intersection criterion in employment and social security indicators (assuming the unit of identification is the household) and, as progress is made, move to a union criterion. Currently, the union criterion has been most commonly used in national MPIs of Latin American (middle-income) countries.[117] From a human rights approach (and from an individual well-being perspective), a union criterion is the correct decision. However, it is also true that households share fortunes and misfortunes (even if sometimes unequally) and some transfers such as CCTs are usually targeted to households. Additionally, problems need to be tractable for effective policy action. In light of this, it is recommended that countries in which the scale of unemployment and/or the low coverage of the social security system are too big and widespread start with a conservative intersection criterion employment

[116]. Underemployment (both time related and income related) demands more extensive questionnaires and further care with cross-country comparability. The NEET indicator is interesting as a standalone indicator, but it can lead to double counting of deprivations in an MPI if included alongside an unemployment and attendance to school indicator.

[117] Except for Chile, the other Latin American countries with national MPIs are middle-income countries. According to the Human Development Index 2017, two of these countries (El Salvador and Honduras) have medium human development, six of these countries (Colombia, Costa Rica, Dominican Republic, Ecuador, Mexico and Panama) have high human development, and one country (Chile) has high human development.

indicator (in line with the jobless households indicator proposed by Atkinson et al., 2002) and, as progress is made, move to a union criterion indicator.

C. The health dimension

Access to health coverage is a fundamental element of social protection that is widely supported by a human rights approach (UN, 1948, art. 25 of UDHR), both for intrinsic as well as instrumental reasons. The International Covenant on Economic, Social and Cultural Rights (ICESCR) (UN, 1966) and several ILO conventions have reaffirmed the right to health coverage. ILO Medical Care Recommendation (ILO, 1944, no. 69) states that medical care service should cover all members of the community, "whether or not they are gainfully occupied" and provides comprehensive guidelines for the provision and delivery of medical care (ILO, 2017). The Social Security (Minimum Standards) Convention (ILO, 1952, no. 102) states the need to provide preventive as well as curative care for "any morbid condition" as well as pregnancy. The Medical Care and Sickness Benefits Convention (UN, 1969, no. 130 and no. 134) extended the standards of Convention No. 102. The Social Protection Floors Recommendation (UN, 2012, no. 202) declares that all in need should have access to essential health care, including maternity care that meets the criteria of availability, accessibility, acceptability and quality.

The MDGs had one health goal, which was focused on one critical aspect: improving maternal health. In the SDGs, that goal has become the first of many targets of the much more ambitious Goal 3, which is to "Ensure healthy lives and promote well-being for all at all ages". Other targets aim at reducing the presence of other specific health issues, such as neonatal and under-five mortality, tuberculosis and malaria. However, Targets 3.7 and especially 3.8 relate to universal *access* to general health care, echoing the human rights framework. Target 3.8 is to "Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all", whereas Target 3.7 aims at ensuring universal access to sexual and reproductive health-care services (strongly linked with Target 5.6).

Promoting universal health coverage has obvious linkages with reducing poverty (SDG 1), universal educational access and better educational quality (SDG 4), advancing gender equality (SDG 5) and inclusive societies (SDG 16) (WHO and World Bank, 2018).

A lack of access to health care is one expression of poverty. The health status of a person can enable or inhibit a wide range of capabilities, including being "employable", remaining healthy for work, developing cognitive skills, and enjoying subjective well-being, etc. Lack of health has the potential to be a source of a number of different poverty traps (Banerjee and Duflo, 2011).

1. Indicators and standards

Universal health coverage indicators are one type of many possible health indicators, which can be classified in multiple ways, table 48 summarises the categories and examples of indicators addressed in what follows; this is aligned with the WHO and EU classifications, but it does not replicate these classifications exactly. table 49 summarises the health indicators included in the global MPI, the MPI-LA and the national MPIs so far.

One noteworthy distinction is between indicators of *access* and indicators of *functionings*. SDG 3.8 puts forward an access indicator. Indicator 3.8.1 is the "Coverage of essential health services (defined as the average coverage of essential services based on tracer interventions that include reproductive, maternal, newborn and child health, infectious diseases, non-communicable diseases and service capacity and access, among the general and the most disadvantaged population)". The minimum information needed to measure this is whether each household member is covered by some sort of insurance or health benefit and which type of insurance it is.

However, health-care systems are structured differently across countries. Data on the services covered, deductibles, co-insurance and benefit ceilings are important for an assessment of the effect of health insurance on an individual's health status, behaviour and utilization of health care services (Grosh and Glewwe, 2000). However, such detailed information seems to exceed the requirements for an indicator

of health coverage as a non-monetary indicator of poverty. At most, the indicator could consider whether a few key benefits are covered, but such key benefits can be quite numerous.[118]

Indicators of (general) health insurance are included in the national MPIs of Mexico, Chile, Colombia, Costa Rica, the Dominican Republic, Moldova, and Vietnam, and in the MPI-LA; the details of actual services covered are not considered. In the MPI-LA, to be considered non-deprived in health, a person is required to have *contributory* health insurance; as it is understood that public health-care provisions tend to be of low quality in Latin America (CEPAL, 2014, p. 80). In that sense, the MPI-LA is more demanding than the access indicators considered in the national MPIs. However, the MPI-LA uses an intersection criterion (no household member has a contributory health insurance), whereas the indicators in the national MPIs use a union criterion, and, in that aspect, they are more demanding than the MPI-LA.

Within access indicators, there is the indicator of *effective* access or coverage: whether the person has received a medical check or treatment when needed. This indicator has some problems. First, usually only a sub-sample has experienced a health issue, which reduces the representativeness of the indicator. Second, the indicator is based on self-reported perceptions of needs, which tend to be related to education, occupation and household income (Grosh and Glewwe, 2000, p. 185). Third, effective access to preventive health care is not necessarily covered (people may not perceive preventive services as a need).[119] In other words, *demand* for health care and actual *need* may not always coincide, and thus self-reported "effective" coverage indicators must be interpreted with caution. Also, an accurate indicator of effective coverage would require information on the quality of the service received (Hogan et al., 2018).[120] Armenia's national MPI includes an indicator of health service quality, but this is from self-reported evaluation of the service, with the limitations this entails.

Despite its drawbacks, "Self-reported unmet need for medical examination and care" is one of Eurostat (2017)'s indicators for SDG 3 (and had been recommended by Atkinson et al., 2002). It is possible that these indicators are more accurate in developed countries, where the general educational level is higher, than in developing ones. Yet similar indicators are included in the national MPIs of Panama, Colombia, Chile, the Dominican Republic, Pakistan and Vietnam. Panama also includes another indicator that covers whether at least one woman aged 15–49 in the household was pregnant in the past five years and did not attend pregnancy checks, for any reason. Pakistan also includes a similar indicator. Mozambique and Armenia's national MPIs include an indicator that may be classified as an "accessibility" indicator, which is related to the distance of the nearest health-care facility (addressed in section I.B.4).

Indicators of functionings are also frequently referred to as indicators of health status or health outcomes. A further distinction within these is between objective and subjective indicators of functionings. The most commonly used objective indicators of functionings include life expectancy at birth, under-five mortality, maternal mortality, low birth weight, arm circumference and anthropometric indicators. Key anthropometric indicators for children under five years old are weight-for-height, which detects wasting as well as children who are overweight and obese; height-for-age, detects stunting; and weight-for-age, which detects underweight children. There is also the BMI-for-age indicator, which also detects wasting, being overweight or obesity.[121] For adults, the anthropometric indicator used is the Body Mass Index [122]

[118] Hogan et al. (2017) developed a composite index of (16) essential health service coverage indicators to monitor SDG Indicator 3.8.1 (note that Indicator 8.3.1 is Tier III). Such an index can be constructed with DHS or MICS data, but again, it seems to exceed the scope of a synthetic non-monetary poverty health-coverage indicator.

[119] There is evidence from India suggesting that the poor tend to look for a cure rather than prevention (Banerjee and Duflo, 2011).

[120] An experiment in New Delhi, India, demonstrated that doctors had very low competence; they tended to underdiagnose and overmedicate (Das and Hammer, 2005).

[121] Wasting reflects a recent and severe process of weight loss often associated with acute starvation or severe disease; stunting reflects cumulative deficient growth associated with long-term factors, including chronic insufficient daily protein intake; and being underweight can be produced by any or both of the other two indicators (UN, 2003). When the measured values in these indicators is below minus two standard deviations from the corresponding median value in the reference population (WHO, 2006), the child is wasted, stunted or underweight, correspondingly, and if the value is below minus three standard deviations from the corresponding median value in the reference population, the case is severe. Weight-for-height or BMI-for-age values above one, two or three standard deviations from the median indicate being at risk of becoming overweight, being overweight or being obese, correspondingly. Stunted children can become overweight.

[122] BMI is computed from data on weight and height (kg/m^2). Adults are considered malnourished if their BMI is below 18.5, overweight if BMI is 25–30, and obese if BMI is above 30.

Many of these objective indicators of health functionings are part of other SDGs, namely SDGs 2.2 (stunting, wasting and being overweight), 3.1 (maternal mortality) and 3.2 (under-five and neonatal mortality). Life expectancy at birth is one of the EU indicators for SDG 3 (Eurostat, 2017). The global MPI and the national MPIs of the Dominican Republic, Nepal and Bhutan include an indicator of child mortality, defined as whether any child has died in the family in the five-year period preceding the survey.

Malnutrition is actually at the core of an absolute concept of poverty. "Starvation, clearly, is the most telling aspect of poverty," (Sen, 1981, pp. 12–13).[123] The limitation on including anthropometric indicators in studies of poverty is that these are not typically collected in regular household surveys (despite LSMS Guidelines recommending the anthropometric module). Surveys that measure income or consumption do not typically measure anthropometry, and vice versa (as is the case with DHS and MICS).

An anthropometric indicator is included in the global MPI, currently defined as whether any adult under 70 years of age or any child for whom there is nutritional information is undernourished in terms of weight for age (Alkire and Kanagaratnam, 2018). Mozambique includes a stunting indicator for children under five years old. Chile also includes a self-reported child malnutrition indicator (whether any household member is undernourished, at risk of undernourishment or is overweight).

The Dominican Republic and Mexico include a nutrition-related indicator that covers households at moderate and severe risk of food insecurity in the case of Mexico, and severe risk of food insecurity in the case of the Dominican Republic. The classification follows the Food Insecurity Experience Scale (FIES) developed by the FAO and adapted for Latin America (FAO, 2012), which is based on the concept of food security proposed by FAO (2006). Colombia is also considering modifying its national MPI to include an indicator of food security (Botello, 2017). The food insecurity indicator is SDG Indicator 2.1.2. It is an indicator constructed from a scale created from the responses to eight questions on a household's self-reported experiences of worrying about an ability to obtain food, having to compromise the quality and variety of food, reducing quantities and skipping meals, and experiencing hunger. Box 2 details the eight standard questions. Food insecurity can be seen as *approximating* nutritional indicators while perhaps posing less of a burden in terms of data collection, but it is in reality a complement indicator, not a substitute.

Subjective indicators of health functionings have also been extensively used for assessing health status. Among subjective indicators of functionings are those on a respondent's physical ability to carry out daily activities in, typically, two categories: basic (bathe oneself, feed oneself, put clothes unaided, stand up from a sitting position in a chair, go to the toilet unaided and rise from sitting on the floor) and intermediate activities (carry a heavy load for 20 meters; sweep the floor or yard; walk 5 km; draw water from a well; bend, kneel or stop). They have been found to be reliable instruments to study the health status of adults (Grosh and Glewwe, 2000).[124] So far, these indicators have only been used in the MPI-EU, but OPHI-MPPN includes a module with these questions. Armenia includes a related but different indicator on "termination of usual activities" due to illness, injury or bad health. Disability is one of the elements repeatedly mentioned by Sen as influencing "conversion factors" from resources into functionings and capabilities.

Another frequently used subjective indicator is self-reported general health status, which is based on the respondent's answer to the question, "In general, how is your health at this time?" where the response categories are "excellent", "very good", "fair", "poor" and "very poor". This indicator is correlated with future mortality (even after controlling for many other variables); yet it does depend on the subjective understanding of what it is to be "healthy" as well as on people's contact with the health system (Grosh and Glewwe, 2000). Self-perceived health status is one of the European Union's indicators for SDG 3 (Eurostat, 2017), but it has not yet been used as an indicator of non-material poverty.

[123] The biological approach to poverty prevailed since the very first poverty measurements (Booth, 1894, 1903; and Rowntree, 1901, in the United Kingdom). In fact income poverty lines are a monetary valuation of the minimum food basket to achieve a minimum adequate nutritional level.

[124] Note that questions on ability are asked about specific daily activities and not with a general reference to "daily activities", a category that is open to more subjectivity.

There are also indicators of health determinants, which vary from access to basic services such as water, sanitation and clean energy (discussed in section I.B.1) to behaviours related to tobacco and alcohol consumption, sexual behaviour and infant feeding practices. Access to water, sanitation and energy have been included as health indicators in Honduras, access to safe water and sanitation as health indicators in Panama and Mozambique's MPIs. Mozambique additionally includes a distance-to-water indicator. In this study, water, sanitation and energy indicators have been placed in the habitat sphere, within basic services.

Finally, there are indicators of health interventions, which the European Union further differentiates into indicators of health services, such as child immunization, breast cancer screenings, hospital beds and so on, and health promotion, such as policies on healthy nutrition.

Table 48
Some relevant categories of health indicators that can be collected in household surveys

Kind of indicator	Examples
Health access indicators*	
Access to health care (in general)	Has health insurance
	Services covered by insurance
Effective access to health care (in general)	Received health care when needed
Health functionings or health status or health outcomes	
Objective	Child/maternal mortality
	Anthropometric indicators
Subjective	Self-rated general health status
	Self-rated limitations in daily activities
	Food insecurity
Health determinants or risk factors	Access to safe drinking water
	Access to safe sanitation
	Access to clean energy
	Behaviour towards tobacco and alcohol
	Sexual behaviour
	Infant feeding practices
Health interventions	
Health services	Vaccination of children***
Health promotion	Nutritional programmes

Source: Own elaboration based on the classification of the European Community Core Health Indicators (https://ec.europa.eu/health/indicators/echi/list_en) and the WHO classification of core health indicators (WHO, 2015). However, the categories used in the table do not exactly replicate those in the mentioned classifications.
*Here the "access and effective access indicators" are contained in the "services coverage" category of WHO, for example. **WHO and the European Union consider anthropometric indicators as risk factors, not as health outcomes. ***Vaccination could also be included among health determinants or risk factors.

Table 49
Health indicators that have been used in MPIs

Indicator		MPI where it has been used
Access indicators		
Health care insurance		Mexico, Chile, Colombia, Costa Rica, Dominican Republic, El Salvador, Moldova and Vietnam's MPIs; MPI-LA
Effective access to health care		Panama, Colombia, Chile, Dominican Republic, El Salvador, Armenia, Pakistan and Vietnam's MPIs;[a] MPI-EU.
Effective checks during pregnancy		Panama and Pakistan's MPIs
Distance to closest primary health centre		Mozambique's and Armenia's MPIs
(Self-reported) quality of health service		Armenia's MPI
Functionings Indicators		
Malnutrition	Anthropometric	Mozambique and Nepal's MPIs; Arab MPI and global MPI
	Self-reported	Chile's MPI
	Food security	Mexico, El Salvador, Dominican Republic, and Bhutan's MPIs
Child mortality		Dominican Republic, Nepal, Bhutan, and South Africa's MPI; Arab MPI and global MPI
Early pregnancy and female genital mutilation		Arab MPI
Disability		Moldova's MPI, MPI-EU
Self-reported overall health status		Moldova's MPI, MPI-EU
Limitations in daily activities		MPI-EU
Health Risk Factors Indicators		
Access to safe water		Panama, Honduras and Mozambique's MPIs; Malaysia's trial MPI
Distance to water		Mozambique's MPI
Improved sanitation		Honduras and Mozambique's MPIs; Malaysia's trial MPI
Clean energy		Honduras' MPI

Source: Own elaboration based on the documents describing each national MPI (cited in the Introduction), Alkire and Santos (2014) and Santos et al. (2015). All access and functionings indicators use a union criterion (at least one member experiencing deprivation) except for the MPI-LA, which uses an intersection criterion. a: In the case of Vietnam's MPI the indicator of effective access is different from the others; there is one indicator that considers as deprived households where no member has used health-care services in the past 12 months and another indicator that considers as deprived households where no member has used health-care services in district-level hospitals or higher-level hospitals during the past 12 months.

Box 2
Food insecurity questions

The FIES survey module

The FIES-SM questions refer to the experiences of the individual respondent or of the respondent's household as a whole. The questions focus on self-reported food-related behaviours and experiences associated with increasing difficulties in accessing food due to resource constraints.

During the last 12 months, was there a time when, because of lack of money or other resources:
(1) You were worried you would not have enough food to eat?
(2) You were unable to eat healthy and nutritious food?
(3) You ate only a few kinds of foods?
(4) You had to skip a meal?
(5) You ate less than you thought you should?
(6) Your household ran out of food?
(7) You were hungry but did not eat?
(8)You went without eating for a whole day?

Source: http://www.fao.org/in-action/voices-of-the-hungry/fies/en/ (Accessed February 2018).
Note: The reference period may also be 30 days.
From the answers to the eight questions a scale has been developed and validated that ranges from mild to moderate to severe food insecurity. Mild insecurity is associated with anxiety about the ability to obtain food; moderate is associated with compromising quality, variety and skipping meals; and severe is about experiencing hunger. See FAO (2012), FAO (Voices of the Hungry), UN metadata on SDG 2 (UN 2016).

Source: Own elaboration

2. Data availability

The availability of health indicators from household surveys varies widely. Surveys such as DHS and MICS are especially designed to cover a wide range of fundamental health issues in developing countries such as malnutrition, child mortality and maternal health. At the other extreme, regular national household surveys are sometimes labour force type of surveys and thus cover very few, if any, health issues. In between, some multitopic surveys (of LSMS type for example) offer a middle-range amount of health information.

This array of health indicators availability is evidenced in table 50, which summarises the availability of different kinds of indicators across the different type of surveys considered in this study. The column corresponding to the LSMS type of surveys is not based on the recommended modules contained in Grosh and Glewwe (2000), but rather on what seems to be the most common practice, based on Latin American regular household surveys. There is an extensive LSMS health module proposed in Grosh and Glewwe (2000) that covers most of the topics mentioned in table 49, as well as an anthropometric module. The OPHI-MPPN survey modules constitute an interesting option, collecting several key health indicators without becoming a health survey.

Information on access and kind of health-care insurance is generally collected in regular household surveys of LSMS type on all household members (see table 51) Response categories on the *kind* of health insurance should be as exhaustive and specific as possible, tailored to each country. With some knowledge of the insurance systems in the country at hand, this in turn allows an assessment of the quality of health coverage. A similar question is also collected in DHS and MICS, but on restricted sub-populations (there is no information on elderly members of the household). However, as can be seen in table 42, even considering all these cases, only 30% of analysed surveys contain the health insurance question; this percentage is 55% if the EU-SILC surveys are excluded. Questions about effective access to health are not included in DHS, MICS or in the OPHI-MPPN survey. It is sometimes included in national regular surveys and in EU-SILC (see table 52). Table 53 allows comparing with more detail the information available on both access and effective access to health care across the surveys in 17 Latin American countries used for the estimations of the MPI-LA (Santos et al., 2015; Santos and Villatoro, 2016). Fifteen surveys had a question on access and kind of health insurance (with high heterogeneity in response categories, some surveys providing very little discrimination across programmes). Only seven countries included the question on effective access to health care, and the reference periods used range from the previous month to the previous year. The recall period recommended by LSMS is the previous 30 days, as health incidents are more difficult to remember after longer periods (Grosh and Glewwe, 2000). However, it is also true that a longer period (perhaps three months as used in CASEN) captures more health events in the survey. The reasons for an unmet health need are usually asked about, but the array of options varies (as in table 52). Five of the surveys also enquire about further details on the medical services used during the health episode, their cost and insurance coverage, but it is probably impossible to make a full calculation of the benefits of insurance using LSMS-type surveys (Grosh and Glewwe, 2000, p. 189), and thus may not be worth it.

In terms of health functionings, DHS and MICS focus on objective key health functionings in developing countries such as anthropometrics and child mortality. Rarely some LSMS surveys collect some information on fertility and child mortality, but without the detail of a birth record. In contrast, EU-SILC focuses on subjective but highly validated instruments, namely self-reported daily activity limitations, disability and general self-rated health. Interestingly, the OPHI-MPPN survey combines these two approaches. Basic data on child mortality can be collected with DHS and MICS short questions detailed in table 54, without need of constructing a birth record. OPHI-MPPN modules reproduce these questions. Mexico's Encuesta Nacional del Ingresos y Gastos de los Hogares uses an even shorter set, focused on questions 1 and 3 of table 54. Finally, behavioural health determinants are only collected in health-focused surveys such as DHS and MICS, which is understandable.

Table 50
Available health indicators in different types of household surveys

	DHS	MICS	OPHI-MPPN	LSMS-type*	EU-SILC
Access and effective access questions					
Access to/covered by health insurance and type of health insurance	√(r)[a]	√(r)[a]	√(r)[d]	√	X
Effective access to health care (met or unmet need) and reasons for unmet need	X[b]	X	X	sometimes	√
Maternal health (antenatal, delivery and postnatal care)	√	√	√	X	X
Newborn care	√	√	X	X	X
Health functionings questions					
Daily activity limitations	X	√	√	rarely	√
Disability	X	√	√	rarely	√
General self-rated health	X	X	X	rarely	√
Child anthropometrics (height, weight)	√	√	√	X	X
Adult anthropometrics (height, weight)	√(r)[c]	X	√	X	X
Anaemia	√	X	X	X	X
Weight at birth	√	√	X	X	X
Infant and child mortality	√	√	√	rarely	X
Health determinants or risk factors*					
Infants feeding practices	√	√	X	X	X
Tobacco and alcohol behaviour	√	√	X	X	X
Child vaccination	√	√	X	rarely	X
Behaviour regarding malaria (use of mosquito nets, etc.)	√	X	X	X	X
Behaviour regarding HIV/AIDS	√	√	X	X	X
Family planning (use of contraceptives) and fertility	√	√	X	X	X

Source: Own elaboration based on each survey questionnaire mentioned. In the case of EU-SILC, the questionnaires of the United Kingdom and Spain were consulted. *For LSMS, the column is based on more extended practices rather than recommended questionnaires and guidelines contained in Grosh and Glewwe (2000).
Notes: **We exclude from this table access to safe water, sanitation and clean energy, as these have been covered in section I.B.1. r: restricted in some form detailed in each case.
a: In DHS the question is asked of women and men of reproductive age (thus, there is no information for the elderly and children); in MICS it is also asked about children. b: In the household questionnaire there is a set of questions related to unmet needs, but in a different format. The questions enquire whether some household member was sick for at least three months in the past 12 months and whether he or she received any medical support, such as medical care, supplies or medicine, for which they did not have to pay. Also, in the women's questionnaire there is a related question, but it is different in essence and thus not comparable to the typical question about unmet health care given perceived need. It asks "When you are sick and want to get medical advice or treatment, is each of the following a big problem or not a big problem: (a) Getting permission to go to the doctor? (b) Getting money needed for advice or treatment? (c) The distance to the health facility? (d) Not wanting to go alone." c: restricted to women and men of reproductive age. d: questions on the ability to take part in daily activities are asked only about children. d: The question is asked of employed people, and only as an item alongside other work benefits (Are you entitled to paid sick leave, paid holiday ..., health insurance, etc.?).

Table 51
Most commonly asked questions about health insurance

In Latin America's regular household surveys	
Are you affiliated with, are you contributing to or are you a beneficiary of some health insurance? (Provide examples of insurance in the country) (Ask for insurance card)	Yes/No Details of health insurances available in the country
Do you have some kind of medical coverage for which you pay or some amount of money is deducted from your salary?	Details of type of health insurance
In DHS and MICS	
Are you covered by any health insurance?	Yes/No
What type of health insurance are you covered by? Record all mentioned.	Mutual health organization / community-based health insurance Health insurance through employer Social security Other privately purchased commercial health insurance Other (specify)

Source: Own elaboration from the surveys' questionnaires. In regular household surveys in Latin America the question is asked about each household member. In MICS, the questions are included in all individual questionnaires (women aged 15–49, men aged 15–49, children aged 5–17 and children under age five). In DHS, these questions apply to questionnaires for women (aged 15–49) and men (aged 15–59).

Table 52
Questions on effective access to health care

in EU-SILC	
Was there any time in the last 12 months when, in your opinion, you personally needed a medical examination or treatment for a health problem but you did not receive it?	Yes/No
What was the main reason for not receiving the examination or treatment (the most recent time)?	Could not afford to (too expensive) Waiting list Could not take time because of work, care for children or for others Too far to travel/no means of transportation Fear of doctor/hospitals/examination/treatment Wanted to wait and see if problem got better on its own Didn't know any good doctor or specialist Other reasons
An example in Latin America: CASEN survey (Chile 2011)	
In the last three months, did you have any health problem, illness or accident?	Yes/No
Did you have a medical check or attention due to that health problem, illness or accident?	Yes No DK/Does not remember
Why did you not have a medical check or attention?	Did not consider it necessary and did nothing Did not consider it necessary and took traditional medicines Decided to take my usual medicines Preferred to ask in a pharmacy for medicines for my health problem Preferred to see a specialist in alternative medicine Preferred to look for attention of indigenous healer Considered consulting but did not have time Considered consulting but did not have money Considered consulting but it is too difficult to reach the health-care unit Asked for an appointment but could not get it Got an appointment but am still waiting Got an appointment but did not use it

Source: Own elaboration based on surveys' questionnaires.
Notes: In EU-SILC the same set of questions is repeated separately for dental care. CASEN is Encuesta de Calidad de Vida de los Hogares in Chile, conducted every two or three years.

Table 53
Comparative details on access to health-care questions in Latin American surveys

	Survey	Type of health insurance	Met/unmet need	Reference period for the health need	Reason for unmet need	Details on health insurance coverage
Argentina	Encuesta Permanente de Hogares	√	X	N/A	X	X
Bolivia	Encuesta Continua de Hogares	√	√	Last four weeks	X	X
Brazil	Pesquisa Nac. Por Amostra de Domicilios	X	X	N/A	X	X
Chile	Encuesta de Caracterización Socioeconómica Nacional	√	√	Last three months and last 12 months[d]	√	Details on coverage of health incident and details on other coverage
Colombia	Gran Encuesta Integrada de Hogares	√	√[a]	Last 12 months	Only financial	X
Costa Rica	Encuesta de Hogares de Propósitos Múltiples/ Encuesta Nacional de Hogares	√	X	N/A	X	X
Dominican Republic[b]	Encuesta Nacional de Fuerza de Trabajo	√	X	NA	X	X
Ecuador	Encuesta de Empleo, Desempleo y Subempleo	√	X	NA	X	Whether private insurance covers hospitalization

Table 53 (concluded)

El Salvador	Encuesta de Hogares de Propósitos Múltiples	√	√	Last month	√	Details on coverage of health incident
Guatemala	Encuesta Nacional de Condiciones de Vida	√	√	Last month	√	Details on coverage of health incident
Honduras	Encuesta Permanente de Hogares de Propósitos Múltiples	√	X	N/A	X	X
Mexico	Encuesta Nacional de Ingresos y Gastos de los Hogares	√	√	Last 12 months	√	X
Nicaragua	Encuesta Nac. de Hogares sobre Medicion de Niveles de Vida	√[c]	X	N/A	X	X
Paraguay	Encuesta Permanente de Hogares	√	X	N/A	X	X
Peru	Encuesta Nacional de Hogares, Condiciones de Vida y Pobreza	√	√	Last four weeks	√	Details on health insurance coverage for different health services
Uruguay	Encuesta Continua de Hogares	√	X	NA	X	X
Venezuela	Encuesta de Hogares por Muestreo	X	X	NA	X	X

Source: Own elaboration based on surveys' questionnaires.
Notes: The survey in Bolivia additionally asks whether children under five years old in the household had diarrhoea and whether the child received attention and its cost, etc. This survey also asks about immunizations for children under three years old, as well as fertility and child mortality. a: Colombia's survey asks a different question: "In the last 12 months, did you not see a doctor or not get hospitalized because of lack of money?" Colombia also asks about reasons for not contributing to a health insurance. b: This survey is not the one used for the national MPI. The Dominican Republic designed a special module for that purpose. El Salvador's survey includes fertility and child mortality questions. Guatemala includes some questions on newborn care, child immunization, diarrheal and respiratory conditions among young children. Mexico additionally asks about child mortality. c: In Nicaragua, not all rounds have included the question. d: Chile considers people who needed medical attention in the previous three months or who have been in treatment in the last 12 months for a condition covered by Garantías Explicitas en Salud [AUGE-GES] a public health insurance programme for certain conditions.

Table 54
DHS, MICS and OPHI-MPPN questions on child mortality (with no birth record)

1. Now I would like to ask about all the births you have had during your life. Have you ever given birth?	Yes/No
2. What was the date of your first birth? I mean the very first time you gave birth, even if the child is no longer living, or whose father is not your current partner.	Date of first birth Day Don't know day Month Don't know month Year Don't know year
3. Have you ever given birth to a son or a daughter who was born alive but later died? If no: Any baby who cried or showed signs of life but did not survive?	Yes No Don't know Will not answer
4a. How many boys have died? 4b. How many girls have died?	Number of boys dead Number of girls dead
5. Which of these deaths occurred in the last five years?	Total number of deaths in the last five years
6. Were any of your children more than five years old when they died?	

Source: Own elaboration.

3. Discussion and recommendations

Overall access to some form of health insurance is a baseline recommended indicator whose inclusion should be extended to all regular household surveys. The question should be such that (a) it is asked about *each* household member and (b) the response categories for the kind of insurance should be as detailed as possible (covering contributory versus non-contributory schemes) in order to allow quality discrimination if necessary. Yet, overall access to health care is quite limited as a standalone indicator.

One possibility for enriching the health-care access indicator would be to add one synthetic question about the level of coverage of the health insurance for different broad key categories of medical services, following the Social Security Minimum Standards Convention (ILO, 1952). Yet it may be more effective to complement detailed information on insurance type with secondary information about what that insurance programme actually covers. Building consensus on deprivation thresholds (such as minimum number of services that should be covered, level of cost coverage, etc.) would perhaps be more effective.

Another possibility would be to complement the access indicator with the effective access indicator. This would also offer a comparability point with countries in the European Union region, as this question is included in EU-SILC. Homogenising response categories and reference periods for this question would facilitate comparability. However, the effective access questions are not yet so widespread across surveys, and it is recognised that these are limited instruments. They do not reveal functionings, nor quality of the medical service received. The deprivation levels of this indicator tend to be low, for the reasons explained above (perception of need, incidence of health issues in reference period, level of education).[125] Thus, it is not totally clear that it would add much valuable information. If included, for the purposes of informing policy, it should preferably be kept separate from the health coverage (to discriminate clearly whether there is a problem of affiliation with a system or of delivery of the medical services). Also, reasons for unmet need that qualify as deprivations would need to be defined.[126]

A final note calls attention to anthropometric and child mortality indicators. Although costly, anthropometric indicators provide invaluable information which, as argued above, is at the core of poverty. Capturing malnutrition does not require big sample sizes (the standard of 5000 households is acceptable). Admittedly, collecting height and weight data requires special equipment and in general entails that one member is added to the survey field team (Grosh and Glewwe, 2000). However, the benefits of anthropometric data being available in a more extended and regular way would bring, both in developing and developed countries (where being overweight and obesity are increasing, and is frequently related to poverty), can outweigh the costs. Food security questions are an interesting, easier option. In fact, they can be justified on their own as indicators of non-monetary poverty, but they actually capture a different problem. In turn, child mortality reflects the worst possible health functioning failure. Collecting basic data on households' experiences of a child's death can be done even using only questions 1 and 3 of table 54.

[125] In the European Union (which uses a one-year reference period), the percentage of people with a self-reported unmet need for medical examination and care has ranged between 3.1% in 2010 to 3.2% in 2015. There is some variation across countries: in Luxembourg it ranged from 0.6% to 0.9%, whereas in Italy it ranged from 5% to 7.2% (http://ec.europa.eu/eurostat/web/sdi/good-health-and-well-being). In Colombia (using a one-year reference period) the deprivation rate in this indicator is 7%; in Panama (six-month reference period), 8%; and in Chile (a reference period of three months and 12 months for certain illnesses), 5%. Also note that when this indicator is included in an MPI, as this requires a (cross- dimensional) poverty cutoff, the proportion of people who are poor and deprived in effective access to health care (what is called the 'censored headcount ratio'), will be lower. The problem of low incidence in the sample survey worsens the more specific the health indicator is (e.g. maternal checks).

[126] Financial hardship and waiting lists are undeniable. However, other reasons may also be included, such as distance to the health-care unit and even lack of knowledge.

III. Concluding Remarks

This report has reviewed the most salient indicators of non-monetary poverty covering quite a comprehensive range of dimensions, namely: housing, basic services, education, employment and social security and health, in an attempt to contribute to the operationalization of SDG Targets 1.2 and 1.4.

The specific recommendations for each indicator have already been summarised at the beginning of the document. The overall message is that tremendous progress has been done since the specification of the MDGs back in 2000 on three fronts: putting poverty eradication at the forefront of the international and national development agenda, building international consensus on indicators that matter for poverty reduction and improving data collection. The SDGs are a new opportunity to continue those advancements. The bar has been raised in quantity and comprehensiveness of the intended goals. There are essentially two overarching messages from this report.

First, it is important to continue building international consensus regarding the desirable minimum thresholds. The conceptual delimitation of minimum requirements for water and sanitation by JMP, for energy by GTF for example, are a showcase. Having clarity on such minimums helps the effectiveness of policy. More of that kind of work is required in several other areas, in which although there is vast literature, there are still no so clear minimum thresholds to be achieved, through the lens of poverty reduction. Some of these areas with minimums yet to be more precise are housing materials, overcrowding, housing tenure and durable goods, minimum cognitive skills, employment and health insurance, among others.

Second, there is still room and need for significant improvements in data collection. The delimitation of minimum thresholds will surely inform a more efficient survey design. Advancing towards an integrated and frequent survey instrument, internationally homogenised, focused on a core set of poverty indicators will be a fundamental tool for achieving the first SDG.

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Annexes

Annex 1
Acronyms

CESCR: International Covenant on Economic, Social and Cultural Rights

DHS: Demographic and Health Survey

ECE: UN Economic Commission for Europe

ECEC: Early Childhood Education Care

ECI: Equivalised Crowding Index

ECLAC: UN Economic Commission for Latin America and the Caribbean

EFA: Education for All

ESCAP: UN Economic and Social Commission for Asia and the Pacific

ESCWA: UN Economic and Social Commission for Western Asia

EU-SILC: EU-Statistics on Income and Living Conditions

FAO: Food and Agriculture Organization of the United Nations

FAPP: Floor Area Per Person

GTF: Global Tracking Framework

ILO: International Labour Office

ISWM: Integrated and Sustainable (solid) Waste Management

JMP: Joint Monitoring Programme for Water Supply, Sanitation and Hygiene

LIFI: Legal and Institutional Framework Index

LSMS: Living Standard Measurement Survey

MICS: Multiple Indicator Cluster Survey

MPI: Multidimensional Poverty Index

MPI-LA: Multidimensional Poverty Index for Latin America

MPPN: Multidimensional Poverty Peer Network

PPB: People per Bedroom

PPR: People per Room

UDHR: Universal Declaration of Human Rights

UIS: UNESCO Institute for Statistics

UN: United Nations

UNFCCC: United Nations Framework Convention on Climate Change

UNICEF: United Nations International Children's Emergency Found

WASH: Water, Sanitation and Hygiene

WHO: World Health Organisation

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Annex 2
Summary of recommendations by dimension

Housing

Housing materials

1- Advance towards a more comprehensive international consensus regarding the adequacy of the different materials – especially for rudimentary materials.

2- Response categories should keep each material separately. If grouped, take care not to include adequate and inadequate materials within the same response category

3- For a more accurate assessment of deprivations, include questions on whether the walls have external cladding/revoke and on whether the roof has a ceiling.

4. New response categories may need to be developed to register sustainable building practices based on natural but properly treated materials.

5- Consider constructions using cement fibre as deprived, as it includes asbestos.

Key:

6- Include European Union Statistics on Income and Living Conditions (EU-SILC) questions on visibly damp, leaky roof or rot (Table 8) as a testing module. At the very minimum, they should be a good complement to traditional questions on housing materials. In the best scenario, they may become good substitutes for the traditional questions on housing materials.

Overcrowding

Key:

7- The people per bedroom (PPB) indicator seems to be a good compromise indicator between the ideal and the possible in the near future. The threshold can be set at two people per bedroom to assure that couples at least have a separate room from their children (Kaztman, 1995). If this is not possible, use the people per room indicator.

Further improvements

8- In the middle to long run, build an international consensus on the minimum satisfactory square metres per person, based on social housing requirements across countries.

9- A complementary indicator of external co-residence – whether there are different households living in the same dwelling – is recommended for policy purposes but need not be included in an MPI.

Housing tenure

Key:

10- Include an ownership question, preferably with EU-SILC phrasing (In which of these ways do you occupy this accommodation?).

11- Use a detailed set of response categories. The categories considered in question 3 of table 16 could be used or, alternatively, the categories used in the first question of EU-SILC UK. This is to be decided with as much consensus as possible.

12- Include a question on type of document held, such as question 2 in UIS (table 12). Further consensus needs to be built regarding the response categories considered as deprived, and this needs to be verified with the specific context.

13- Include a question on whether the dwelling is located within an informal settlement or not (Villatoro, 2017a). This provides complementary information at the meso level from the same instrument that contains micro-level information.

Further improvements

14- Combine a question on how long has the person been living there with a question on the type of document or tenure form to assess security, as suggested by UN-Habitat.

15- Inquire about name of the holder of document to allow the construction of gender indicators.

16-Include a question on the perception of tenure security, like question 11 (and perhaps question 10) in UIS (table 12), as complementary information related to the macro level.

Durable Goods

Key:

17- Include a question on access to a core set of durable goods: car, motorbike, bicycle, telephone, TV, refrigerator, washing machine and computer.

Basic Services

Water

Key:

18- Promote the generalised incorporation of a detailed list of response categories of water sources that avoids the now common ambiguous categories such as "well". The DHS and MICS response categories could be used, as they are quite exhaustive (see table 20).

19- A question about whether the water source is in or outside the premises is also key to incorporate, as well as the associated distance-to-water questions (and ideally, the question on who typically goes to fetch the water).

Further improvements

20- Additionally, it may be advisable to separate the question on water source for drinking and cooking from water for other purposes.

21- Incorporate questions and data to determine whether the service is safely managed: (1) "How many hours per day does the household have the water service", and (2) perform the water quality test (which can be done to a subsample, as it is done in MICS).

Sanitation

Key:

22- In terms of sanitation, in view of the basic service definition it is of fundamental importance that all surveys ask about:

(a) the kind of toilet facility (the structure of DHS and MICS presented in table 21 seems very convenient, as it summarises the kinds of toilet with excreta disposal systems),

(b) whether the toilet facility is shared with other households or not,

(c) whether the toilet is within the premises or not.

Further improvements

23- Given that the ultimate goal is achieving safely managed services, a few other questions should be included: on the excreta disposal system and, (for septic tanks) on frequency with which the septic tank is emptied.

Handwashing

24- The presence of handwashing facilities with water and soap should be recorded, given that the health gains of basic water and sanitation services do not accrue if hygiene practices are not followed.

Energy

25- Progressively refine and expand the energy questions in household surveys in developing countries in order to capture issues of off-grid technologies, the level of the electricity supplied, electricity applications used within households and type of cookstoves. MICS surveys provide an excellent guide.

26- Additionally, the energy questions can be complemented with the questions on durable goods.

27-.A question on the legality of the connection would be useful too.

Solid Waste Collection

Key

28- The solid waste collection service has not received the attention it deserves. The environmental and health risks are as serious as that of an unimproved sanitation system.

29- It seems of utmost importance to at least include a question on type of waste disposal.

Further improvements

30- It could be helpful to add questions on the frequency of the collection system, the kind of storage between collection services, recycling practices and whether there is a nearby open dump.

Transportation

Key

31- Transport deprivation is an important poverty dimension. Mobility is a human right in itself and a facilitator of other human rights.

32- It should be possible to include the questions required to compute the accessibility to public transport indicator. (See question 1 in table 35).

Further improvements

33- For a more comprehensive assessment of accessibility issues, incorporate questions on the services that are desirable to be near home. Also, because the nearest service is not always the one actually used by households (for quality or other reasons), questions on means of transport and duration of journey of services actually used can be incorporated.

34- Questions on potential barriers to public transport as well as to non-motorized transportation can provide further insights.

Education

Key

35- Child school attendance and adult schooling achievement of the household are basic pieces of information that need to be included among indicators of non-monetary poverty.

36- The attendance indicator should be extended to cover at least one year of pre-primary education and possibly two, but this needs to be in accordance to national laws to be fully enforceable and meaningful. It would be a simple adjustment to require surveys to collect attendance data since 4 or 5 years of age.

38- In terms of the upper-age bound, to the very minimum the interval needs to cover up to the necessary age of completion of lower secondary education.

39- For the adult schooling achievement indicator, follow the practice of requiring different educational levels according to age and national contexts.

40- If individual indicators need to be transformed to match the household as the unit of identification, the union criterion is recommendable for the child school attendance indicator (to align with the rights of the child). Adult schooling may use an intersection criterion in contexts of more widespread educational deprivations, and gradually move towards a union criterion as progress is made. However, awareness of

implied identification issues of the extreme criterions (union and intersection) in these transformation procedures are important (see Santos 2018b).

Further improvements

41- Explore (based on MICS experience) whether a compact survey instrument on (a) early childhood care and (b) fundamental cognitive skills could be incorporated in regular surveys.

Employment and social protection

Employment

42- Include an unemployment indicator. However, both the definition of the working-age population and the reference period should be harmonised across countries to preserve comparability. Given that the international definition of employment is quite undemanding, it is desirable to include indicators for informal employment.

43- Whenever possible, combine the unemployment indicator with the presence of discouraged workers, potentially active people and unpaid workers. The first two categories constitute an invisible form of unemployment and can be captured relatively easily by adding the required response categories into an already quite mainstream question. Data on unpaid workers is also frequently available.

44- Include an indicator on contributions to the pension system, as they are a key element of formal labour (as well as a predictor of poverty in old age). It is important to also include self-employed people in this indicator.

Social protection

45- Include an indicator that measures whether people of retirement age are receiving retirement pensions, as this is one fundamental floor of social security systems.

46- Aspects of employment and social protection should be grouped into homogeneous categories that can inform policy, especially when breaking down MPIs by dimensions and indicators.

47- If individual indicators need to be transformed to match the household as the unit of identification, countries may start with a conservative intersection criterion in employment and social security indicators. As progress is made, they can move to a union criterion. Again, awareness of implied identification issues of the extreme criterions (union and intersection) in these transformation procedures are important (see Santos 2018b).

Further improvements

48- The receipt of transfers to vulnerable groups (unemployed, disabled, children, pregnant women) shall not be included in MPIs (to avoid a tautological problem), but such indicators need to be collected for an accurate monitoring of the social protection system.

49- Access to other employment benefits could also be considered (and data is generally available or can be relatively easily collected) but these have been included less frequently in indicators of non-monetary poverty.

Health

50- Access to some form of health insurance is a baseline recommended indicator which inclusion should be extended to all regular household surveys. The question should be such that (a) it is asked about each household member, (b) the response categories for the kind of insurance should be as detailed as possible (covering contributory vs. non-contributory schemes) in order to allow quality discrimination if necessary. Yet, overall access to health care is quite limited as a standalone indicator.

51- A practical way to enrich the health care access indicator is to complement it with secondary information about what that insurance programme actually covers. Consensus needs to be built on (and across) deprivation thresholds related to coverage of the different medical services.

52- Another possibility would be to complement the access indicator with the effective access indicator, which would offer a comparability point with countries in the EU region. However, deprivation rates being typically low throughout developed and developing countries in this indicator cast doubts on the real value added of this indicator.

53- Anthropometric and child mortality indicators should be included, at least among less developed countries. Anthropometry can also be useful in developed countries, to capture overweight and obesity problems, more widespread among the poor.

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