The Investment Case for SDG 4 Data

Concept Note

Technical Cooperation Group
on SDG 4–Education 2030 Indicators
Dubai, United Arab Emirates

Summary and purpose[1]

Imagine the scenario in which a newly appointed education minister arrives at the ministry, with a modern approach and steadfast commitment to the spirit and reporting of the Sustainable Development Goal on education (SDG 4). Yet the momentum fades quickly, as the minister realizes that they are in many ways like an air traffic controller, who sees a deadly storm looming on the horizon of a major airport when suddenly 80% of their navigation instruments begin to malfunction. In many countries, education ministers simply don't have the data to avoid or even mitigate a global learning crisis, which is engulfing more than half of all children of primary and lower secondary school age, according to estimates by the UNESCO Institute for Statistics. In short, the optimum management of an education system is no less complex than managing a country's air traffic control system.

Both the political agendas and monitoring frameworks of the SDGs and Education 2030 are extremely ambitious. They demand an unprecedented increase in the collection, processing and dissemination from and, most importantly, within countries. The main purpose of the SDG 4 monitoring framework is to guide countries towards a comprehensive education agenda while minimising the burden on them of monitoring these activities.

Knowing how much this monitoring will cost is therefore both important and complex but it can also serve to identify the funding needs and add a "reality" check on the resources involved. It can thus inform dialogue on how we, as a community, get organized to monitor SDG 4. But focusing only on costs is to know the price of things and not the value of anything. The paper thus also starts trying to estimate how much we would benefit from better monitoring. Thus, the paper sets out the case for investing in SDG 4 data in all dimensions and is designed to raise the profile of the needs for monitoring and to build the case for multi-year commitment.

The intended audience for the material in this document is countries (officials and civil society), the international community and potential investors in education data. Resource mobilisation and communication staff are likely to produce shorter/more focused versions to support specific audiences and purposes. This longer document serves as reference.

The global governance mechanisms currently in place provide an excellent context to define a sound strategy. To achieve the SDG 4 agenda, everybody (national statistics offices, international organizations, donors and other stakeholders) needs to be aligned according to some sort of global compact or strategic plan or agreement on what matters, how to fund it, and who does what. The notion of a thorough, one-off planning re-set (without pretending one can have a one-off blueprint for more than a whole decade, but with cost estimates in any case), implemented with more energy and funding, is key.

The measurement challenges are complex and substantial. The investment case in education data and sustainable information systems is required to:

    a.   Ensure that the SDG agenda has a well-funded monitoring framework;

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[1] This document was prepared by Silvia Montoya, Director of the UNESCO Institute for Statistics (UIS), and Louis Crouch, Senior Economist of Research Triangle International (RTI). The costing simulation has benefitted from insights by Manos Antoninis, Director of the Global Education Monitoring Report.

b. Guide investment with clear recommendations in terms of prioritisation according to various criteria; and
c. Address multiple SDG indicators by focussing on coverage issues of different sources of information.

The investment over the remaining period until 2030 is around US$2.8 billion. This would comprehensively cover all the costs of a solid monitoring compact. Some two thirds of the cost is due to the set of global set of indicators and the rest are due to the thematic indicators. The costs assumes that all thematic indicators would be collected by all countries. The per-country cost over this long period is only US$135 million on average, or US$1.35 million per country per year.

From the total cost of US$280 million per year, 45% are new funds (US$128 million) to add to the US$152 million currently being spent either through aid to low-income and lower-middle-income countries and self-funding for the SDG 4 agenda in the upper-middle-income and high-income countries. 50% of the new funding should be aid for low-income and lower-middle-income countries. The reminder is the self-funding investment of upper-middle-income and high-income countries.

To invest or not to invest in SDG 4 data? The answer is quite simple. Based on comparing the benefits (or potential savings) with the resources allocated to gather the data, it is clear that the investment will have a high return, especially for low-income countries. Data show that US$1.4 million per year are needed to generate data, while this spending could liberate US$143 million for the average country.

The idea is to build on already-existing methods and frameworks for producing education data. For example, education management information systems (EMIS) and finance data are prevalent in most countries, so the effort now should be on increasing efficiency and coverage in terms of disaggregation. Thus, there is no need to develop new sources of data but to invest in improving and expanding current methods.

Most of the funding needs are for new assessments focused on learning and skills outcomes from early childhood development to higher-level skills acquired for various domains. But a lot of work remains to be done regarding the use of data.

Other data sources, such as household or school random sample surveys, have proven to be useful in other sectors but are often distrusted and/or misused by education planners. Very often planners are not aware of the potential of these surveys, when they are properly undertaken. It is therefore important to question what may be the best strategy: whether to address each new indicator by adding an education module to existing surveys or to create a new, dedicated survey. It seems impossible to add as many questions as needed to most existing surveys and it is better to think of a combined household and school survey that could take care of ALL indicators that are not possible through learning assessments or administrative data.

Although they represent a small share of the overall investment, methodological development and resources needed for capacity development and technical assistance are incorporated into all estimations.

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1.   Motivation

The Agenda for Sustainable Development combined with Education 2030 present an ambitious commitment for the international education community. This vision places new demands on countries, especially producers and users of education data. In contrast to the Millennium Development Goals (MDGs) and Education for All (EFA), which emphasised universal completion of basic education and reducing educational disparities linked to sex, the focus of Sustainable Development Goal (SDG) 4 is "inclusive and equitable quality education and lifelong learning opportunities for all."

Monitoring SDG 4 requires reliable, high-quality and cross-nationally-comparable data from a variety of data sources, compiled at regular intervals. The data must be collected, processed and disseminated based on a common set of norms and standards. The data must also be made easily accessible to policymakers and other stakeholders to ensure that education policy is guided by sound data.

The production and dissemination of high-quality education statistics is essential for effective planning, as well as for monitoring progress toward national and global education targets. Evidence-based planning reduces system costs by allocating resources more effectively. The added cost of improving data—as long as the data are actually used—is likely much lower than the implicit cost of bad or no information. Planning with bad data inhibits optimal policy implementation, particularly with respect to resource allocation and its equity and efficiency. For example, if input and enrolment data are not clearly traceable to the school level, some schools are apt to have two or three times as many resources per child as other schools. Sometimes this is associated with poverty (e.g. schools for the poor get fewer and worse resources) and sometimes it is simply random. Studies have found, in some countries, that some districts use up as much as 100 times more of specific resources (e.g. paper) per pupil than others, without discernible impact on results. This is both inequitable and inefficient.

The SDG monitoring framework has a set of 43 thematic indicators. Of the 43, the current set of 11 global and 32 thematic indicators for the follow-up and review of the SDG 4–Education 2030 Agenda were developed during the period 2014 to 2015 and agreed in 2016 by the United Nations Statistical Commission (UNSC) and the Technical Cooperation Group on SDG 4–Education 2030 Indicators (TCG) respectively. Both sets of indicators *(see **Table 1**)* were subjected to several rounds of open consultations before being finalised and agreed by countries.

Table 1. The SDG results framework

Target	Number of indicators	Global	Concepts
4.1 Quality in primary and secondary education	2	1	Learning
	2		Completion
	2		Participation
	1		Provision
4.2 Access to quality early childhood development, care and pre-primary education	2	1	Readiness to learn
	2	1	Participation
	1		Provision
4.3 Access to affordable and quality technical, vocational and tertiary education	3		Participation
4.4 Relevant skills for employment, decent jobs and entrepreneurship	2	1	Skills
4.5 Elimination of gender disparities in education and ensuring equal access to all levels of education for the vulnerable	Parity indices		Equity across targets
	4		Policies
4.6 Adult literacy and numeracy	2	1	Skills
	1		Participation
4.7 Knowledge and skills needed to promote sustainable development	3	1	Provision
	2		Knowledge
4.a Education facilities that provide safe, non-violent, inclusive and effective learning environments for all	3	1	Resources
	2		Environment
4.b Expand globally the number of scholarships available to developing countries	2	1	Scholarships
4.c Increased supply of qualified teachers	2	1	Qualified teachers
	2		Trained teachers
	2		Motivation
	1		Support
Total	**43**		

Note: See Annex III for details.
Source: UNESCO Institute for Statistics.

Many countries are already challenged in collecting the most basic data on education systems, yet the broader global monitoring efforts mandated by the SDGs will require a wider range of indicators. Moreover, SDG 4 presents more complex demands than the MDGs, with its strong focus on quality education leading to effective learning outcomes, and with the importance given to the development of basic literacy and job-relevant skills of the population. Implementing the agenda on improving learning and the population's knowledge and skills in different domains is complex. This complexity poses significant new challenges to producing data and indicators required for monitoring progress towards SDG 4 targets linked to the quality of education *(see **Table 2**).*

For effective monitoring of the SDGs, a combination of data from a multiplicity of sources is essential. This is especially true for SDG 4, where administrative data, which play a crucial role for national planning purposes, provide only some of the information needed for monitoring progress towards the goal of inclusive and equitable quality education and lifelong learning opportunities for all. Some of the key data sources that constitute a comprehensive education data and information system include administrative datasets, data collected through household surveys, learning assessments, and finance and expenditure datasets. There are different challenges with each data source as described in Annex I.

Table 2. Indicators by source of information

Data source	Number of global indicators	Number of thematic indicators
UIS from EMIS and other sources	2	16
Household Surveys	3	3
Learning Assessments	2	2
School-based surveys	1	2
Other sources	3	20

Note: See Annex III for details.
Source: UNESCO Institute for Statistics.

2. Rationale for investing in education data

In the process of measuring the SDGs and assessing how much information to produce in pursuit of the SDGs, various commentators have commented on the cost of information on the indicators. But there seems to be *little discussion about the value of information: a benefit that could potentially offset the cost.*

This section describes an approach to calculating the value of information, using basic education as an example. We suggest that by basing policy on good data, education systems could get a certain volume of output X out of their current expenditure.

Many examples suggest that some of the biggest problems are in data accessibility and actual data usage for management and decision-making, especially for managerial use below the central ministry level. The non-usage of data creates a chicken-and-egg problem: if systems do not have good examples demonstrating that the use of data leads to improved resource allocation (and if policymakers do not trust the data), then they will tend to under-invest in data, which will in turn make it difficult to develop good management using data and increase trust.

Evidence from the health sector strongly suggests that interest in data preceded, and led to, the hugely disproportionate investment made in data systems in that sector relative to the education sector (e.g. DHS Program and the fact that MICS has so much more health data than education data, or the existence of DHIS2 which has not been duplicated in the education sector).

How much can a system save or, better, how much more can a system do with current resources? We proposed that the upper bound on the value of information is the difference between the "net

revenue" produced by an education system under "best practice" information and under "normal practice" information.[2] The approach focuses on the value of reducing uncertainty by providing information. In other words, a "rational" actor should be willing to pay for information right up to the point where the payment for the information eats up the extra "profit" (in a private or social setting) generated by having the information.

This is the upper bound since political and economic considerations can stop the system from acting on "best practice" information. There is no observable characteristic, though, that differentiates a system that lacks data from one that does not act on it. Rational actors would not pay for information if they know ahead of time that they cannot act on it.

This is a very simplified version of the problem that can be summarised in the following expression:

$$Value\ of\ Information = \ \max((BBP - BNP) - (CDC\ BP - CDC\ NP))$$

where

Value of Information is the value of information,

BBP is the extra benefit generated by best practice,

BNP is the benefits generated by normal practice,

CDC is the cost of data collection for Best Practice *BP* and *NP.*

Graphically *(see **Figure 1**)* we could consider that a country is producing for a combination of inputs in point E. The country could either move to point B to maximise production (by making better use of resources and not reducing expenditure) or it could stay in point E saving money for the same level of production. Thus, there is a scenario where a system could either produce more with the same resources (from point E to point B) or save money for the same output (stay in point E) using less resources[3].

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[2] This is a standard definition or approach, similar to the "Expected Value of Perfect Information" approach.

[3] We are assuming that this saving could take various forms from quantity to the quality of the resources. A feature of information, thus, might be the knowledge that, for example, it might be better to have relatively large class sizes but with better teachers. Or, that by altering the mix of inputs between teachers and the presence of high-quality coaches (or in-service training and support for the teachers) one can improve the quality of teaching, which then gets reflected in the difference between the outputs achievable under best practice and under normal practice.

Figure 1. Production possibility frontier
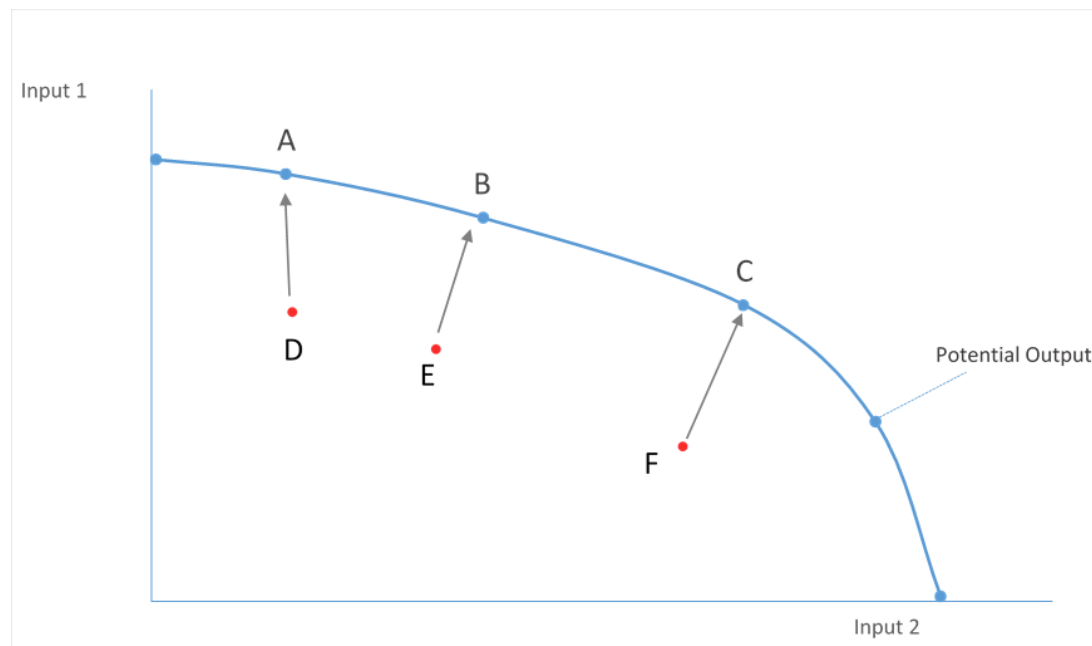
But is information enough? Is information the only input that would allow the system to move from point D to point A? Not in our view. Data (i.e. information) are necessary but not the only factors to produce an efficient education system. To improve efficiency, three inputs are needed to identify the upper bound of how much could be gained and, in fact, achieved:

- Information about what to do and how to do it, what works, and which is the best mix of inputs or the good practices;

- "Political will" to act on that information; and

- Management information, unit by unit, to identify who is under-producing. In general, this step is fairly straightforward.

All three elements are needed to generate improvement. If you have the information but no political will or management capacity, then the results will not achieved. But WITHOUT information, efficiency is lost due to unawareness.

What can be the gains in efficiency? In other words, how much less can a given country spend to achieve the same outputs, liberating resources for other areas? **Box 1** describes previous literature, with estimated gains ranging from 10% to 30%[4].

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[4] Di Gropello, E. (2006). "Meeting the Challenges of Secondary Education in Latin America and East Asia". *Directions in Development* . doi:10.1596/978-0-8213-6645-5.
Herrera, S. and G. Pang (2005)." Efficiency of Public Spending in Developing Countries: An Efficiency Frontier Approach". *SSRN Electronic Journal*. doi:10.2139/ssrn.2018832.

Box 1. Measuring efficiency: A review of literature

In their World Bank Policy Research Working Paper, "Efficiency of Public Spending in Developing Countries: An Efficiency Frontier Approach", Santiago Herrera and Gaobo Pang attempt to quantify the measurement of efficiency. The authors present an application of non-parametric methods to analyse the efficiency of public spending, and based on their sample of 140 countries, they estimate efficiency scores.

Their results show that on average developing countries could increase their educational attainment between 10% and 30%, with the same input level. Some institutional or economic factors cause some countries to be more efficient than others. For example, the authors have found that countries which have low education efficiency scores have larger expenditure levels, public financing which represents a large share of total expenditure of services, inequality in the income distribution and de-urbanisation .

Another paper that takes an attempt at measuring efficiency is "Meeting the Challenges of Secondary Education in Latin America and East Asia: Improving Efficiency and Resource Mobilisation". In this paper, Emanuela di Gropello measures the efficiency of education resources in her effort to evaluate how countries can address the multiple challenges they face in secondary education, given their different development levels and technical and financial capacities.

The paper employs a production frontier for this analysis, which is derived from observing the most efficient operations of countries or schools, demonstrating relatively high output for input. The idea, of course, is to be as close as possible to the efficiency frontier to be deemed efficient. The resulting efficiency score analysis shows substantial margins for improvement in the two regions examined. On average, the author calculates a 15% increase in academic achievement and grade attainment at equal cost if systems were to be efficient.

2.1 Simulating the efficiency gains

Let's do an analysis using expenditure data from the UIS [database](). The upper bound that can be attained in efficiency will be based on the empirical studies described in Box 1, with efficiency gains ranging from 15% to 30% with current expenditure.

In the best case scenario, there would be an efficiency gain of 30% in the upper bound. If this 30% is applied as "savings" or resources liberated to expand either the quantity or quality of public expenditure of a given country X, then we have a concrete picture of the amount of resources liberated.

Thus, as a first step, **Table 3** presents the simple average expenditure for all countries (including the high-income countries with high expenditures) and for countries classified according to the level of income.

Table 3. Public expenditure (in millions of current US$)

Expenditure	Low-income countries	Lower-middle-income countries	World
Median expenditure	361	1,006	1,431

Notes: Average for the period 2007-2015. Public expenditure for influential countries (such as China and Nigeria) with missing data was estimated using average regional percentage of spending on education as percentage of GDP.

The second step is to estimate the upper bound of 30% as potential savings for low- and middle-income countries, using the assumption that high-income countries implement better practices already. The results of this exercise is presented in **Table 4**. The table described this upper bound along with alternative scenarios for savings of 20% or 10%, respectively.

Table 4. Simulation of savings per year per country (in millions of current US$)

Savings	Low-income countries	Lower-middle-income countries	World
10% savings	36	101	143
1% savings	4	10	13

Source: UNESCO Institute for Statistics.

These alternatives scenarios are second- and third-best options if other constraints (e.g. political will, technical or managerial issues) do not permit the achievement of the full maximisation point of 30%. The table summarises savings per average country in millions of US dollars per year.

As we will see below, improving data in most countries would cost only a very small fraction of what could, in principle, be saved or how much more could be done by using that information. Even if the use of data could save only 10%, we are dealing with a negligible investment for such a big return to investment.

3. What are data shortcoming and gaps?

The challenges and constraints that can hinder the production and use of education data at the national and international levels can be grouped around five key factors that are linked and reinforce each other:

1. The mandatory data collections may not be carried out, may be slow or may be inaccurate;
2. The institutional environment may be weak, including political will and managerial shortcomings, to implement changes;
3. There may be a lack of methodologies and standards or a multiplicity of them;
4. Technical capacity, in particular to add value to and interpret data, may be insufficient; and
5. Data use and data literacy may be limited.

Figure 2. Factors that can explain the lack and poor quality of education data
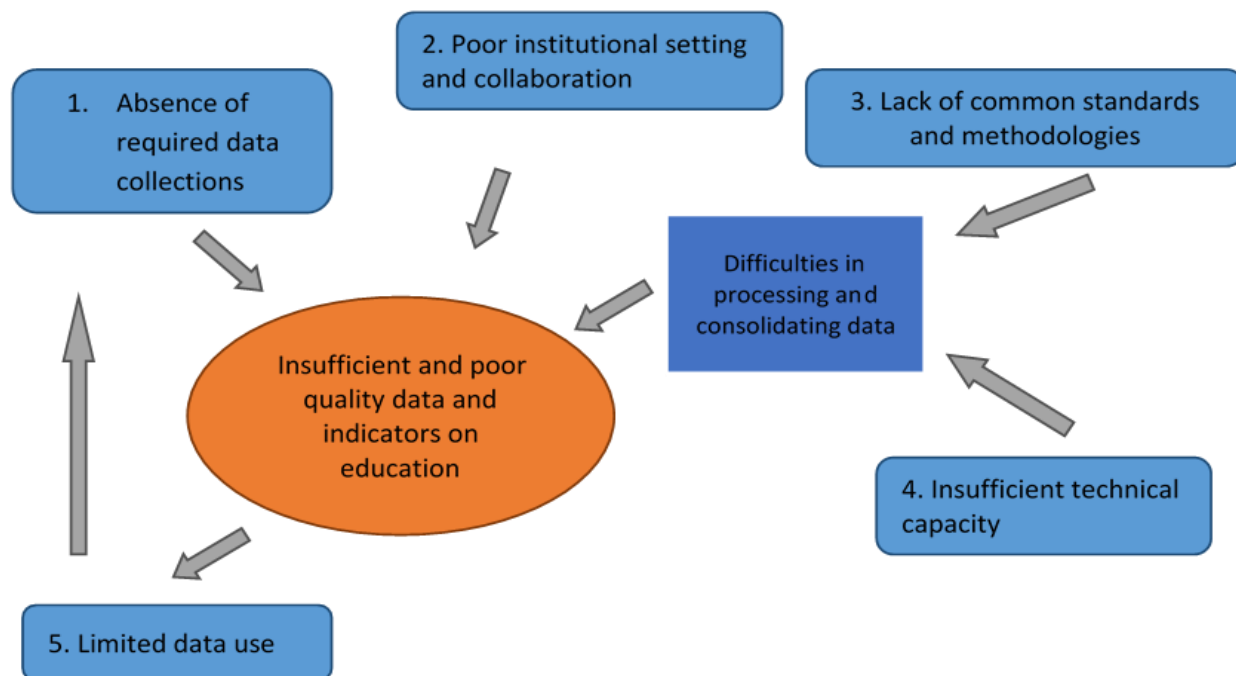
Several critical gaps are plaguing the current international monitoring dashboard. Some parts of the education system are not well covered, some populations are excluded and, finally, some aspects of education simply are not measured. Gaps exist according to different criteria.

3.1 Data gaps by sector

Table 5 presents another view by providing a summary of what data are currently available by data source. **Table 6** shows that most equity-focused initiatives that attempt to produce data for the global monitoring of equity in education are actually secondary data sources, relying mostly on non-education, non-equity-focused primary sources.

Table 5. Availability of education data by sector

	Enrolment	Graduates	Teachers' count	Teachers' training	Government expenditure	Household expenditure	Learning outcomes/skills assessment	Other surveys
Early childhood care and education	green (very good)	N/A	light green (good)	light green (good)	yellow	orange	red	orange
Primary education	green (very good)	green (very good)	green (very good)	light green (good)	yellow	orange	orange	orange
General secondary education	green (very good)	light green (good)	light green (good)	yellow	yellow	orange	orange	orange
Formal TVET	light green (good)	light green (good)	yellow	yellow	orange	red	red	orange
Non-formal TVET	red	red	red	red	red	red	red	orange
Formal adult education	light green (good)	orange	red	red	red	red	red	orange
Non-formal adult education	red	red	red	red	red	red	red	orange
Tertiary education	light green (good)	light green (good)	light green (good)	red	yellow	orange	red	orange

- green: Data exist, usable, well defined, accessible and with very good coverage
- light green: Data exist, usable, well defined, accessible and with good coverage
- yellow: Data exist, usable, well defined but would need extra efforts to compile nationally and report internationally
- orange: Some data exist but with limited coverage/quality/usability
- red: No data/problematic data/require major developments and resources

Table 6. Measuring equity with currently existing data sources

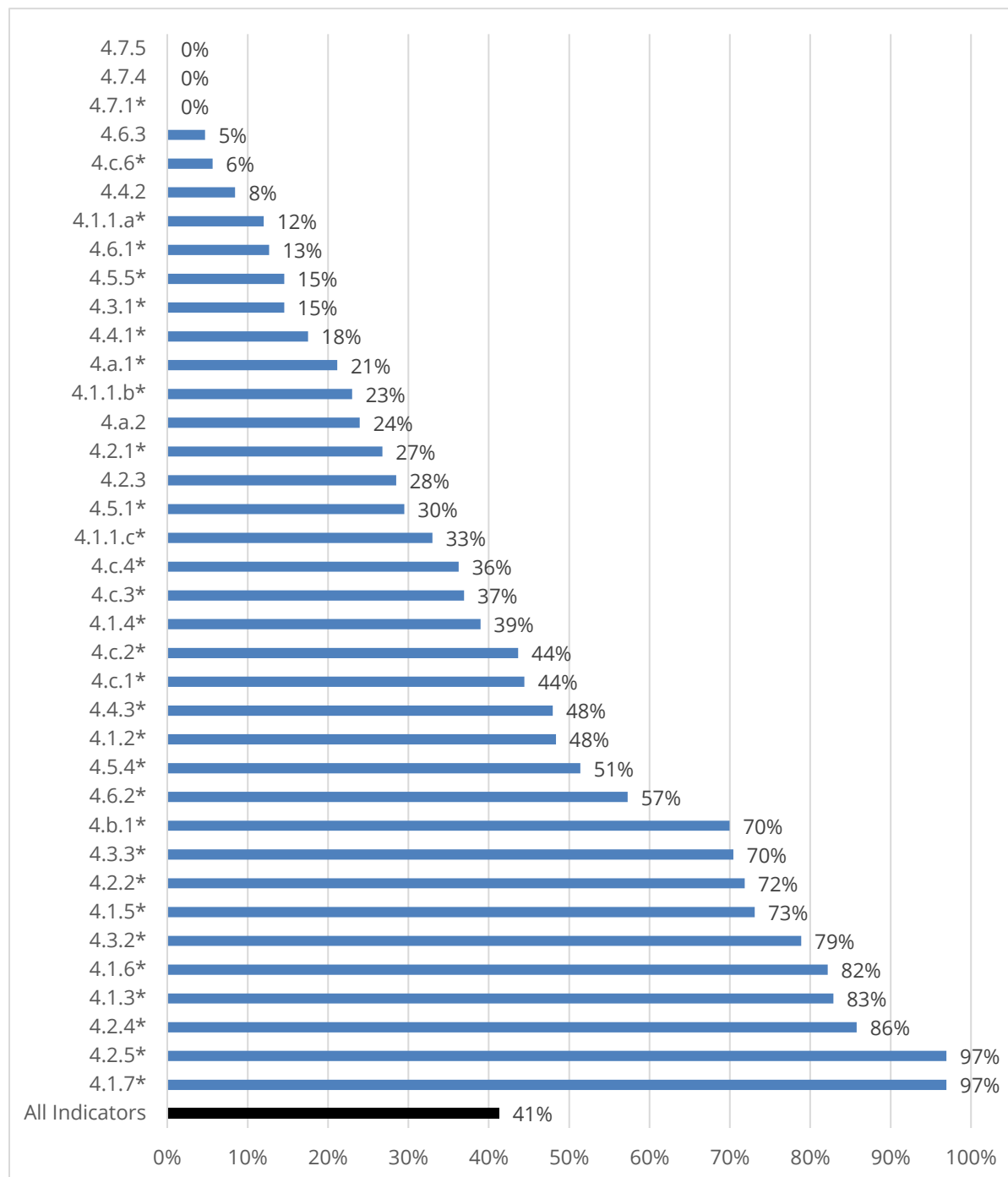| Initiative/ survey	Author	Primary or secondary data source	Education focused	Equity focused	ISCED 0	ISCED 1	ISCED 2	ISCED 3	ISCED 4+	Gender	Rural/urban	Wealth	Disability	Location	Language	Ethnicity	Conflict-affected	Other	Resources/inputs	Access	Participation	Retention/Survival	Attainment	Learning outcomes	Literacy/skills	Geographic coverage
International data exercises (multiple data sources)																										
UIS- Administrative data	UIS	Secondary	Yes	No	O	O	O	O	O	O	✖	✖	✖	✖	✖	✖	✖	✖	O	O	O	O	O	✖	O	World
UIS- Household survey data	UIS	Secondary	Yes	Yes	✖	O	O	✖	✖	O	O	O	✖	✖	✖	✖	✖	✖	✖	✖	O	✖	✖	✖	✖	Developing countries
Educational Attainment and Enrollment around the World	D. Filmer, WB	Secondary	Yes	Yes	✖	O	O	✖	✖	O	O	O	✖	✖	✖	✖	✖	✖	✖	✖	O	O	O	✖	✖	Developing countries
DME-WIDE	UNESCO GEMR	Secondary	Yes	Yes	O	O	O	O	✖	O	O	O	✖	O	O	O	✖	✖	✖	O	O	✖	O	O	✖	World
Ed. Stats/Education Equality	World Bank	Secondary	Yes	Yes	✖	O	✖	✖	✖	O	O	O	✖	O	✖	O	✖	✖	O	✖	O	O	O	✖	✖	Developing countries
Socio-Economic Differences in Health, Nutrition and Population within Developing Countries	Gwatkin et al., WB	Secondary	No	Yes	✖	O	✖	✖	✖	O	✖	O	✖	✖	✖	✖	✖	✖	✖	✖	O	✖	O	✖	✖	Developing countries
data.unicef.org	UNICEF	Secondary	No	No	✖	O	✖	✖	✖	O	O	O	✖	✖	✖	✖	✖	✖	✖	✖	O	O	✖	✖	O	Developing countries
UCW Project	ILO, UNICEF, WB	Secondary	No	Yes	✖	✖	✖	✖	✖	O	O	✖	✖	✖	✖	✖	✖	O	✖	✖	O	✖	✖	✖	✖	Developing countries
UNGEI	UN	Secondary	Yes	Yes	✖	O	O	✖	✖	O	✖	✖	✖	✖	✖	✖	✖	✖	✖	✖	O	✖	✖	✖	O	Developing countries
OECD.stat	OECD	Secondary	No	No	O	O	O	O	O	O	✖	✖	✖	✖	✖	✖	✖	✖	O	O	O	O	O	✖	O	OECD countries
International data exercises (single data source)																										
TIMMS	IEA	Primary	Yes	No	✖	O	O	✖	✖	O	O	O	✖	✖	O	O	✖	✖	O	✖	✖	✖	✖	O	✖	High to lower-middle income
PIRLS	IEA	Primary	Yes	No	✖	O	O	✖	✖	O	O	O	✖	✖	O	O	✖	✖	O	✖	✖	✖	✖	O	✖	High to lower-middle income
PISA	OECD	Primary	Yes	No	✖	✖	✖	O	✖	O	O	O	✖	✖	O	O	✖	✖	O	✖	✖	✖	✖	O	✖	High to lower-middle income
DHS	ICF	Primary	No	No	✖	O	O	O	O	O	O	O	O	O	O	O	✖	O	✖	O	O	O	O	✖	O	Developing countries
MICS	UNICEF	Primary	No	No	✖	O	O	O	O	O	O	O	O	O	O	O	✖	O	✖	O	O	O	O	✖	O	Developing countries
Regional data exercises																										
UIS- Asia Survey on Teachers	UIS	Secondary	Yes	Yes	✖	O	O	O	✖	O	O	O	✖	O	✖	✖	✖	✖	O	✖	✖	✖	✖	✖	✖	East and South/West Asia
PASEC	Confemen	Primary	Yes	No	✖	O	✖	✖	✖	O	O	O	O	✖	O	O	✖	✖	O	✖	✖	✖	✖	O	✖	Africa (French speaking)
SAQMEC	SAQMEC	Primary	Yes	No	✖	O	✖	✖	✖	O	O	O	✖	✖	O	O	✖	✖	O	✖	✖	✖	✖	O	✖	Africa (English speaking)
LLECE, SERCE, TERCE	UNESCO	Primary	Yes	No	✖	O	✖	✖	✖	O	O	O	✖	✖	O	✖	✖	✖	O	✖	✖	✖	✖	O	✖	LAC
Transmonee	UNICEF	Secondary	No	No	O	O	O	O	✖	O	✖	✖	O	✖	✖	✖	✖	✖	✖	O	✖	✖	✖	✖	✖	CEE/CIS
					20%	90%	60%	40%	20%	100%	75%	75%	20%	25%	45%	40%	0%	15%	50%	25%	65%	40%	40%	35%	25%	

Source: UNESCO Institute for Statistics.

3.2   Data gaps by indicator

The UIS estimates the rate of coverage for each indicator based on the numbers of countries in each region where the indicator has at least one variable data point between 2010 and 2016. If an indicator has several components, the rate of coverage is based on the combined rates for the components. The data presented here are based on the latest UIS education data release of June 2017 and presented by source of information. The overall rate of coverage is 36% for all indicators and all regions of the world. **Figure 3** is not intended to provide detail by indicator but to offer a snapshot of the extent of variation by indicator.

Figure 3. Coverage of SDG 4 indicators

Indicator	Coverage
4.7.5	0%
4.7.4	0%
4.7.1*	0%
4.6.3	5%
4.c.6*	6%
4.4.2	8%
4.1.1.a*	12%
4.6.1*	13%
4.5.5*	15%
4.3.1*	15%
4.4.1*	18%
4.a.1*	21%
4.1.1.b*	23%
4.a.2	24%
4.2.1*	27%
4.2.3	28%
4.5.1*	30%
4.1.1.c*	33%
4.c.4*	36%
4.c.3*	37%
4.1.4*	39%
4.c.2*	44%
4.c.1*	44%
4.4.3*	48%
4.1.2*	48%
4.5.4*	51%
4.6.2*	57%
4.b.1*	70%
4.3.3*	70%
4.2.2*	72%
4.1.5*	73%
4.3.2*	79%
4.1.6*	82%
4.1.3*	83%
4.2.4*	86%
4.2.5*	97%
4.1.7*	97%
All Indicators	41%

Note: * Indicator reported in 2017.
Source: UNESCO Institute for Statistics.

3.3 Data gaps by type of survey (and indicator)

Data coverage also varies according to the source of the data. There are two sources: mainly administrative data (EMIS) that exist in every country and finance data. Other sources of information, such as learning assessments and household surveys, are more limited in coverage and frequency.

Figures 4 to **6** show the coverage rate for indicators grouped by data source. It is evident that administrative data have the highest coverage rate.

Figure 4. Coverage for indicators from learning assessments
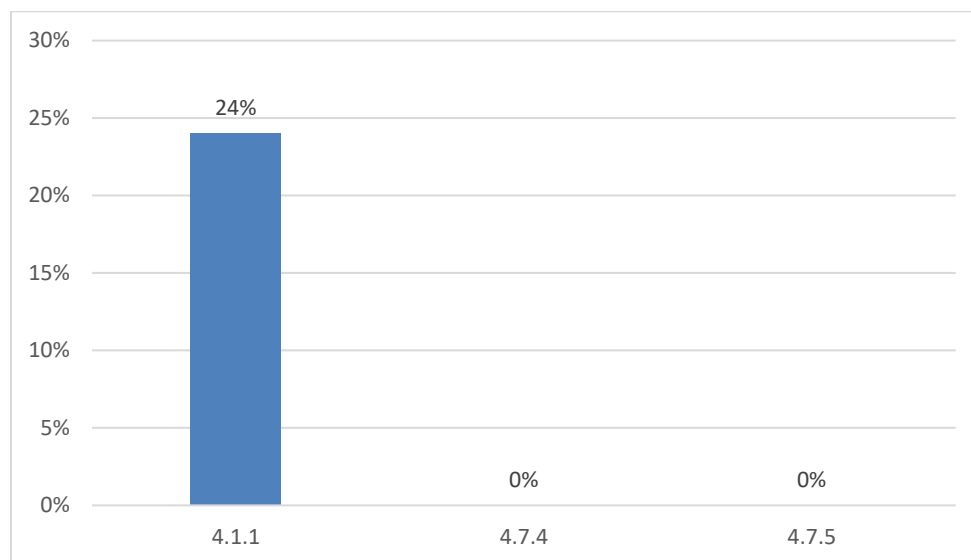
Source: UNESCO Institute for Statistics.

Figure 5. Coverage for indicators from household surveys

Source: UNESCO Institute for Statistics.

Figure 6. Coverage for indicators collected by the UIS from EMIS and other sources

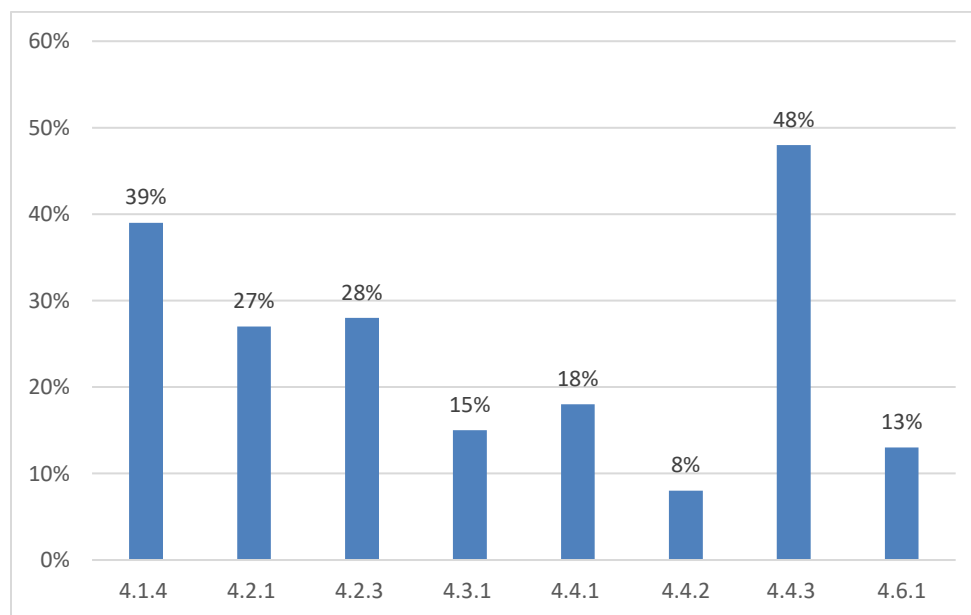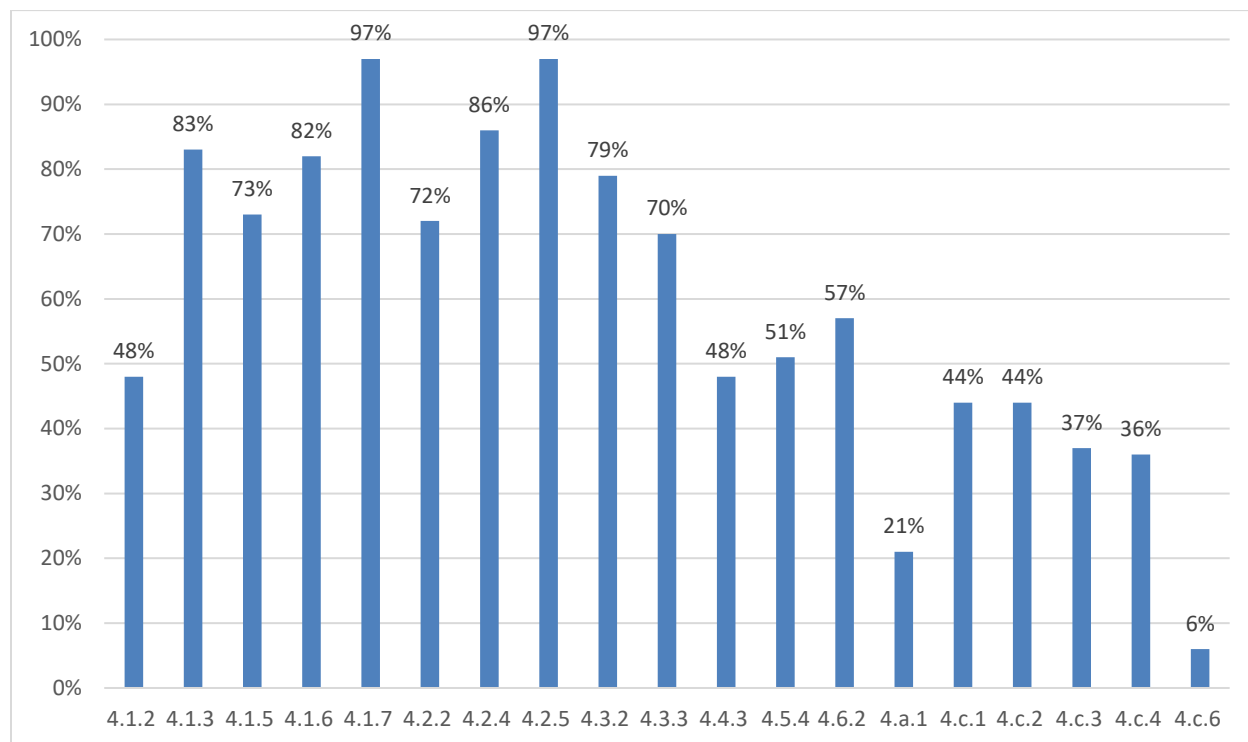

Source: UNESCO Institute for Statistics.

Six targets where more than half of their indicators have coverage lower than 40%: 4.4, 4.5, 4.6, 4.7, 4.a and 4.c. Therefore, those areas are priority to assess possibilities for indicator dropping and adding new ones to improve monitoring capacity of the indicator framework.

3.4 The geographies of data gaps

A different approach is to look at data gaps by region. **Figure 7** shows the coverage of finance data, while **Figure 8** shows SDG 4 data availability by income level. In both cases, countries with the largest data gaps are located in sub-Saharan Africa, Eastern Asia and the Small Islands States.

Figure 7. Coverage of education finance data by source of expenditure and income level
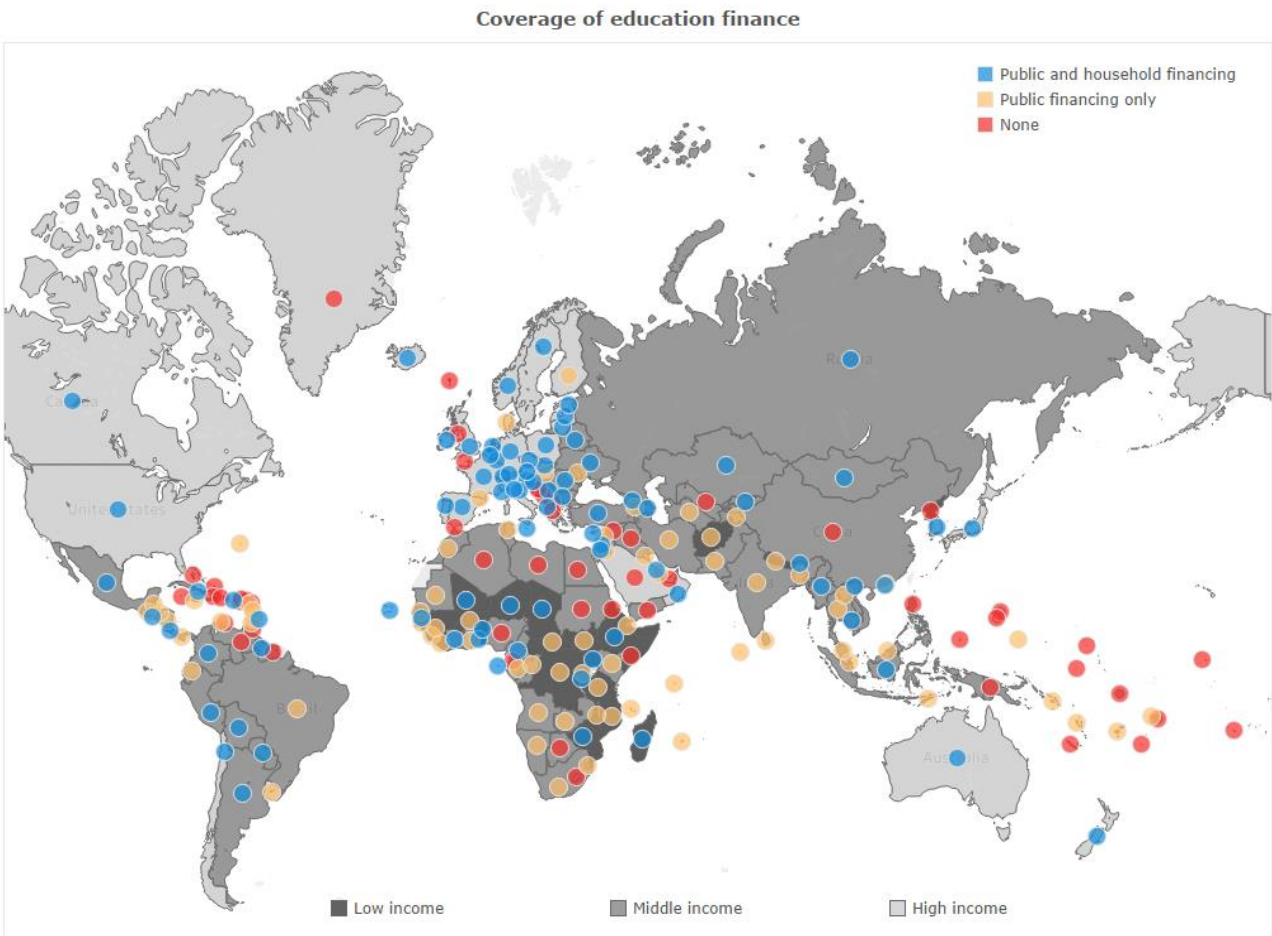
Source: [UNESCO Institute for Statistics](https://uis.unesco.org).

Figure 8. SDG 4 indicator coverage by income level
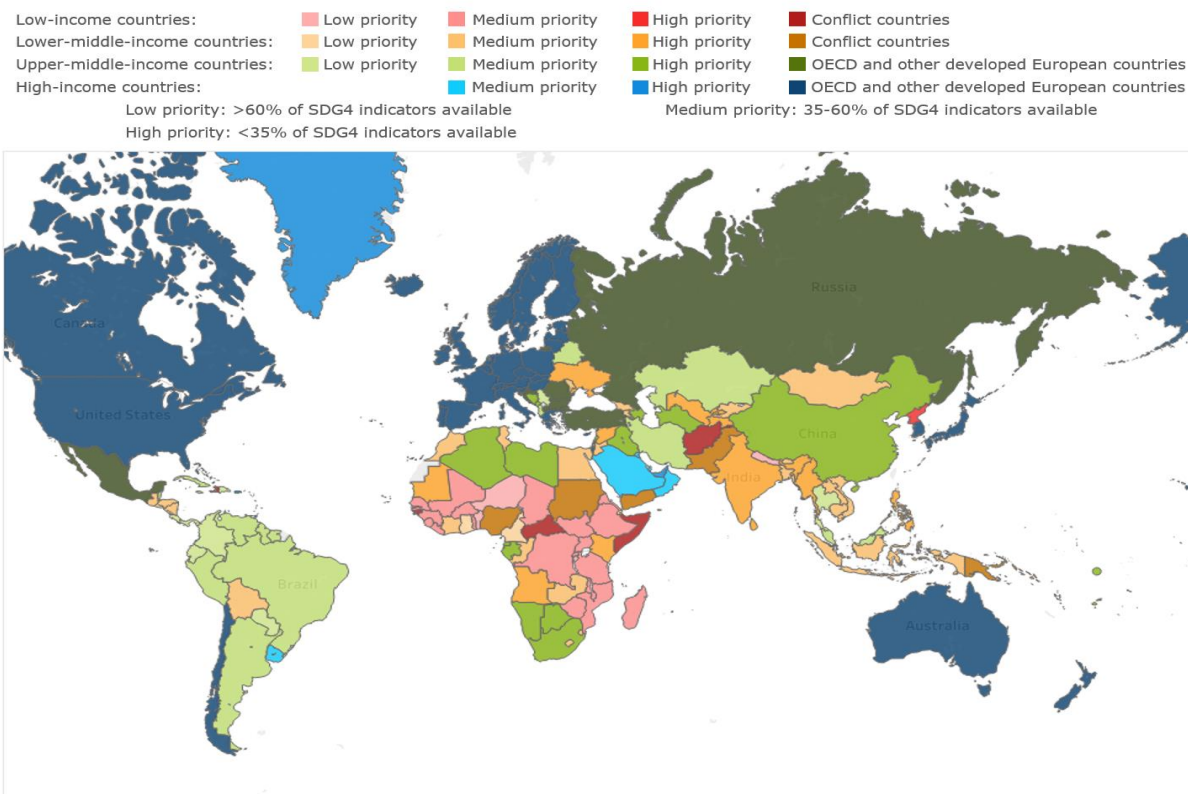
Source: UNESCO Institute for Statistics.

3.5 Methodological gaps

Another challenge in the availability of SDG 4 data are the indicators that still need methodological development. The Technical Cooperation Group (TCG) on SDG 4–Education 2030 Indicators is responsible for leading the development of certain indicators through close cooperation with Member States, civil society representatives and experts from international and regional organizations.

Some indicators are already in the process of being developed. Other indicators with methodological gaps fall into several different categories. For example, there are agreed methodologies for some indicators that work in certain regions but would need to be tested in all regions. Thus, these methodologies still need to be reviewed to ensure that they are applicable across the world. They will be addressed by the TCG working group in its next phase of work.

The remaining five indicators will require more extensive work and may need to involve external experts and possibly substantial revisions to the originally-proposed indicator. The TCG also identified additional areas for further development, but this work will not begin until most of the existing indicators have been addressed by the group.

Table 7. Indicators by reporting status and their need for methodological development

Target	Number	*Of which:*	
		for reporting in 2017	**requires further development**
Target 4.1 By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education	7	7	1
Target 4.2 By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education	5	4	2
Target 4.3 By 2030, ensure equal access for all women and men to affordable quality technical, vocational and tertiary education, including university	3	3	1
Target 4.4 By 2030, substantially increase the number of youth and adults who have relevant skills for employment, decent jobs and entrepreneurship	3	2	3
Target 4.5 By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training	5	3	2
Target 4.6 By 2030, ensure that all youth and aa substantial proportion of adults, both men and women, achieve literacy and numeracy	3	2	2
Target 4.7 By 2030, ensure all learners acquire knowledge and skills needed to promote sustainable development,	5	1	5
Target 4.a Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all	3	1	3
Target 4.b By 2020, substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education	2	1	1
Target 4.c By 2030, substantially increase the supply of qualified teachers	7	5	2

It is important to consider the cost and time required to develop these methodologies. However, it is important to note that these amounts will undoubtedly be under-estimated. Why? The biggest issue could lie in the application of these methodologies, which is difficult to predict even with indicators with existing methodologies. In some cases, there is still by no means total agreement.

4.   What would a SDG 4 monitoring compact look like?

We need a global monitoring system and strategy to produce SDG 4 data in a valid, reliable and timely way in all countries. This system should build (and expand) on existing efforts. Additional coordination and harmonisation are needed to expand the coverage and comparability of the data, especially learning assessment data:

> ➢ A **global strategy for education data** that includes all components standards, methodologies, technical assistance and capacity development and all stakeholders under same vision.

➤ **Funding strategy** that includes

      o **Technical responses** through a set of tools

           ▪ A set of tools and standards to compare and define benchmarks

           ▪ A set of standards and guidelines of good practices including a data quality assessment framework for each type of information.

      o **Data collection:** with reference to all sources of information related to a global data strategy.

      o **Capacity development** at the country and regional level that contemplates all stakeholders and actors in all levels of government and all phases of data production, collection and use**.**

➤ **Global Coordination** and reduction in transaction costs:

      o For effective monitoring of the SDGs and better decision-making, close collaboration of all national and international stakeholders in the field of education is required. Data embedded in a national strategy for development of the educational statistics and the work of education data clusters that all allow all stakeholders to work under the same focus and action plan.

5. What is the cost to fund the monitoring compact?

The SDG 4-Education 2030 Agenda is very ambitious in terms of monitoring and will require a significant amount of data collection, processing and dissemination from and, most importantly, within countries. It is therefore critical but complex to know how much this monitoring will cost. Many decisions must be made in terms of what data collections are needed and how their costs can be estimated, which are affected by several factors and underlying assumptions. The estimated total global cost will therefore inevitably be a very rough estimation but should nonetheless give us an idea of the scale of the effort needed.

The proposed framework estimates the annual and total costs of monitoring the 43 indicators of the Education 2030 Agenda over the next 10 years, covering all low-, lower-middle- and upper-middle-income countries. The total cost is estimated based on an average cost in each of the three groups and then multiplied by the number of countries in these three groups.

Not everything can be costed. The realm of what is needed to produce the breadth of data implied by the SDG 4-Education 2030 Agenda is large and includes several statistical prerequisites that are not specific to the education sector, such as an efficient and transparent Public Financial Management System from which government expenditure on education can be extracted, or good general census data, essential as a basis for all population-based statistics. These types of data collections are not included here, as it is very difficult to estimate how much from them can be imputed to education, and in any case if they are not being produced, there is little that the education sector could, or probably should, do about it. In addition, the costs of collecting information on laws and regulations are not included even though several indicators require this sort of information.

The approach used here is to move forward based on needs by defining the data source for each indicator, grouping indicators according to data sources, and then defining the needed activities, inputs and costs. As such, it is a programme-driven or goals-driven budget.

The simplification that is necessary and makes it possible to do this is to define a limited set of activities and inputs that can serve most of the goals and give each one a standardised unit cost (which can be flexible). This makes it possible to model the costs fairly efficiently and fully at least for initial discussion purposes.

The initial analysis looks at which indicators are currently being reported and which are new and might require initial methodological refinement or capacity building in the country. As such, the costs are built "up" from the indicators to a set of standardised activities needed to improve them, each with a standardised price. Therefore, each single indicator does not have a standard unit price, unless the indicator requires a special effort, on its own, to be gathered.

Three necessary inputs to estimate full costing. First input is the identification of the sources of information needed to monitor as well as the indicators to estimate including methodological developments and related needs to implement the measurement. Table 2 in Section 2 summarises the information by sources with reference to the number of indicators needed but did not specify the indicators and did not clarify that in some cases some indicators, now reported using administrative data, could be reported either using Household surveys.

Table 8 does this exercise for indicators classified both by Thematic and Global status and by source of information. There is the list of indicators but we have added a list of indicators currently collected through a specific source of information it could collected through other source of information. The clear examples are indicators today gathered through administrative data that could be collected through Household Surveys. How this is going to be implemented is not the objective of this document and it does not assume that could be done yes or yes.

Table 8. Indicators by target and type of source

		Global	Thematic
Administrative data	EMIS and other		4.1.2
			4.1.3.
			4.1.5.
			4.1.6
			4.1.7
		4.2.2	
			4.2.4
			4.2.5
			4.3.2
			4.3.3
			4.3.5
		4.5.4	
		4.a.1.	
		4.a.2	
		4.c.1.	4.c.2.
			4.c.3
			4.c.4
			4.c.5
			4.c.6
			4.c.7
Learning assessments	School-based	4.1.1a	
		4.1.1.b	
		4.1.1.c	
			4.7.4
			4.7.5
			4.5.2
Household surveys	Traditional		4.1.4
		4.3.1	
		4.4.1.	4.4.2
		4.4.3	
		4.6.2	
	Multipurpose (MICS, LSMS, etc.)	4.2.3	
	Household survey learning assessments	4.1.1	
		4.2.1	
		4.6.1	
	Reported through administrative data But could be household survey for reporting		4.1.3
			4.3.2
			4.3.3
		4.5.1	
			4.5.2
			4.7.2
			4.7.3
			4.c.7

5.1 Assumptions

The second step is to estimate the unit cost along with the assumptions for each type of information and all related activities t is estimated using unit cost of the administration of the survey as indicative as there are other costs that are as relevant as the implementation itself. Information about the costs of different activities has been provided by key informants detailed in Annex VI. Assumptions are described in here and in Annex VI.

✓ Indicators can be gathered by adding questions to existing questionnaires, for which the marginal cost is essentially zero. It does not seem logical for the international community to start paying, on a recurrent basis, the ongoing cost of EMIS operations to which a few tasks have been added, except for the once-off cost of capacity building.

✓ For indicators that require field data effort, such as data on learning assessments, the cost is indeed calculated indicator by indicator.

✓ For some data we have assumed an "omnibus survey" (not a survey for each indicator) would be useful for the cases (xx% of countries or xx% of indicators) where relying only on administrative data might be deemed insufficient or unproductive. It is assumed that a new survey may be needed in a large share of countries to gather data which cannot be collected by administrative systems or learning assessments. We have assumed for simulation's sake that we would have a sort of "omnibus survey" for these cases in which a household survey would be considered a good idea.

5.2 Unit costs

Learning assessments US$0.5 million, but some are a little lower, and we have added the cost of initial discussions, piloting, etc. US$0.5 million is more accurate than US$1 million.

Household surveys, US$0 .5 million. Plus added the costs of initial refinements, capacity building, etc. But note that not all countries apply them, and we can choose whether to apply them every year or three times in the 10 years, for example.

Administrative data, US$0.5 million. Is not priced with a unit cost. But the assumption here is that EMIS offices are already sending out forms and that adding to the form is not a "cash cost" that we can easily model.

Module costs for multi-purpose household surveys are priced at US$0.2-0.25 million dollars.

Other costs are detailed in Annex VI.

5.3. Who pays

Crucial information for funding purposes is to ascertain who is paying what and if the funds currently available are enough or if new efforts are needed.

Who foots the bill? We have assumed that that the low- and middle-income countries receive aid in different forms and by various donors, while upper-middle and high-income countries invest their own funding.

Is it new funding or existing funding? We have estimated that the expansion of coverage is new funding to be added to the current pool of funding.

Table 9. How funding operates

Countries by income	Aid		Self-funding	
	Existing	**New**	**Existing**	**New**
Low	X	X		
Lower-middle	X	X		
Upper-middle			X	X
High			X	X

5.4. Results

Table 10 suggests that the total annual cost of data collection is US$2.8 billion with an annualised cost of US$280 million for all countries and US$14 million per country over the ten-year period: thus US$1.4 million per year on average.

Global indicators consume two-thirds of the investment, while the remaining one-third goes to thematic indicators. If we group all indicators which measure learning or skills (including indicators in Targets 4.2, 4.3 and 4.6 on early childhood development, literacy and digital skills), then the percentage for skills and learning outcomes shares increases to 80%. The remaining 20% is then split between administering household surveys (19%) and additional activities that are important but marginal.

Table 10. Estimate of SDG 4 data collection (in thousands of US$) over a ten-year period

Basic cost components	Total	Global indicators	Thematic indicators
Capacity development and technical assistance	37,017	7,934	29,083
Innovation	10,050	2,606	7,444
Household surveys or facility surveys	514,913	134,325	380,588
Household-based assessment (early childhood development and adults skills)	743,675	743,675	NA
Learning assessments	1,466,042	995,542	470,500
Equipment and other inputs	24,156	12,670	11,486
Total	2,795,853	1,896,751	899,101
Annualised	279,585	189,675	89,910
Average per country	13,507	9,163	4,343
Annualised per country	1,351	916	434

Source: UNESCO Institute for Statistics.

Costing can be based on self-funded countries or those receiving financial assistance *(see **Figure 9**)*. In the simulation, it was assumed that in low-and lower-middle-income countries resources come from aid, upper-middle- and high-income countries use their national resources. In the first case,

Aid needs to treble from 31 to 93 million a year assuming current funding is not going to be changed and kept the allocation to low and low income countries. In the case of self-funding the increases is around 33% increase from 121 to 186 million US$ dollars per year. On average the amount increases in 80% from 152 to 280 million per year.

Figure 9. Cost of data collection by source of funding in millions of US$ dollars per year
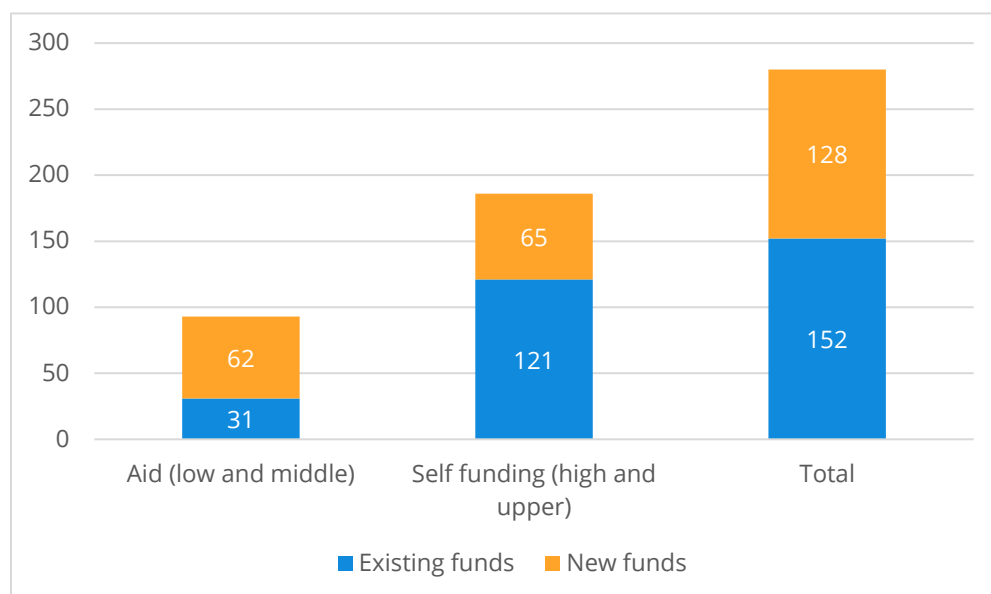
Source: UNESCO Institute for Statistics.

This will end by generating a different composition in the future with higher participation of aid in the funding of SDG4 data as **Figure 10** shows.

Figure 10. Distribution of education data funding by source of funding
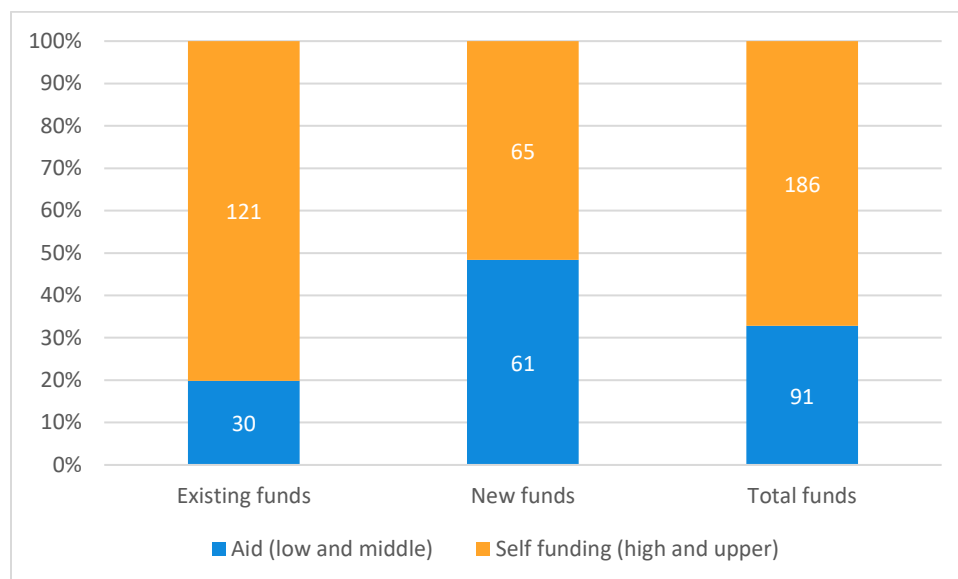
Source: UNESCO Institute for Statistics.

Figure 11 informs about the share of countries by income level that need aid for gathering data on learning assessments by income level. It clearly shows the greater need for funding by low-income countries, which, as previously explained, will rely on aid.

Figure 11. Share of countries by level of income and funding needs for learning assessments
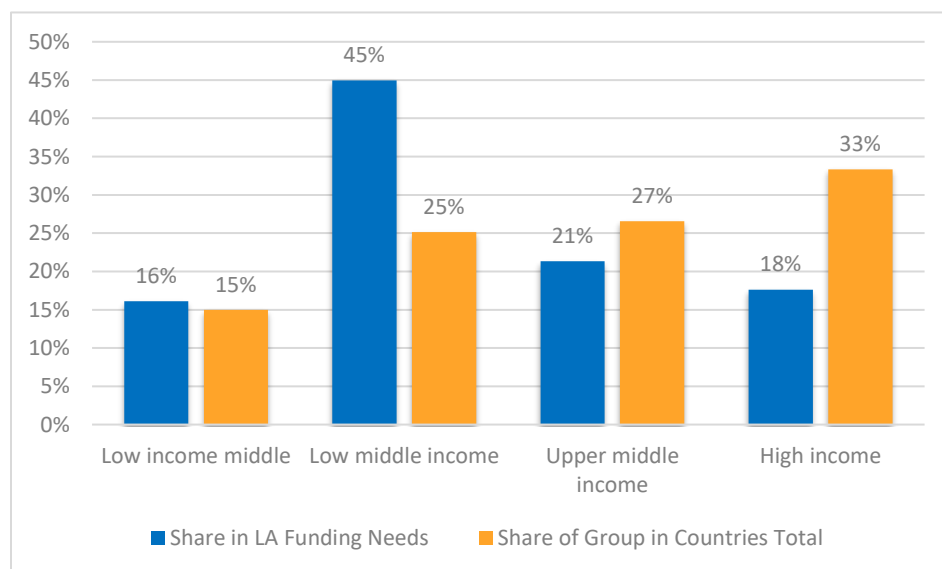
Source: UNESCO Institute for Statistics.

5.2   Comparing costs and benefits

When considering these estimates, it is essential to focus on the costs per country compared to the potential savings. This is particularly important for low- and middle-income countries, which it is assumed have less developed systems of information.

Table 11 presents the costs and benefits by income level of countries. In a conservative scenario, the annual per country cost is US$1.35 million on average, while the benefits of data investment range from about US$36 to 101 million on average for low- and low-middle-income countries. Once again, we want to stress that this is under the most conservative scenario of 10% savings. We assume that the upper-middle- and high-income countries are already experiencing gains.

Table 11. Assessing benefits for investing in data per year (in millions of US$ dollars)

Country by type	Cost in US$	10% efficiency gains in US$ current	1% efficiency gains in US$ current
Low income	2.6	36	3.6
Low middle income	6.3	101	10
Average country	1.4	143	14

Source: [UNESCO Institute for Statistics](#).

6. Key conclusions and messages

1. To invest or not to invest in data to monitor progress towards SDG 4? The answer is quite simple. We need to compare the benefits (or potential savings) with the resources allocated to gather data. It is clear that the investment has a high return, especially for low- and lower-middle-income countries.

2. Where do countries start and where should they invest? Global or thematic indicators? The global indicators have been endorsed by the highest political levels in each country and, though not compulsory, represent a priority for countries. An assessment of needs and priorities by country will set the priorities at a national level.

3. Funding for a monitoring system should be increased by about 50%. For low- and lower-middle-income countries, the funding should come from aid, while upper-middle- and high-income countries should self-fund.

4. The first step in defining data sources are analysing what currently exists regardless of quality and where new sources need to be developed to collect the required data. EMIS and finance data are prevalent in most countries and the data are already being collected; most of the effort needs to go into increasing efficiency and coverage in terms of disaggregation. So there is a small investment to be made but it is not a new data source for countries

5. Gathering data on learning assessments is more challenging than collecting data from EMIS or on financial expenditure on education. And most of the funding needs are due to implementing learning and skills outcomes from early childhood development to youth and adults skills in various domains.

6. Other sources, such as household surveys, have been useful in other sectors but are often still distrusted and/or misused by education planners, often due to a lack of knowledge on their potential when implemented well.

    o   Questions remain as to how to collect all of the data needed to produce all of the indicators. Should more modules be added to existing surveys or does the answer lie in creating a dedicated survey per indicator?

    o   Most existing surveys will not accept the addition of so many additional questions. Thus, if one is to be complete and include many of the thematic indicators, it is likely that new surveys will be needed. It will be much less expensive to create omnibus surveys to take care of many of these issues at once, rather than to prepare special-purpose surveys for each issue.

7. Finally, regarding methodological developments and the resources related to capacity development and technical assistance, they were incorporated in the costing although they represent a small percentage of the overall investment.

Annex I. Issues by type of data source

✓   Administrative data are based on information collected in the management of the education system. These are usually used by ministries of education for management and planning purposes, and are typically updated on a regular basis. Most of the international monitoring for the previous global development agenda (EFA and MDGs) was based on administrative data produced by countries and compiled by international organizations. However, even these data were quite incomplete for the MDGs, not to mention the SDGs.

✓   Household surveys are an important source of data on access, participation and educational attainment. Surveys differ in terms of coverage, frequency, and objective and questionnaire design. In contrast to administrative data, they are collected less frequently, and by a variety of organizations and countries. In some cases, the surveys are nationally implemented and in others, administered under the auspices of an international organization. In the health sector, they are relied upon almost as much as administrative data. The education sector tends to under-utilise surveys, in spite of their huge potential, partly due to lack of statistical literacy.

✓   Learning assessments include national school-based assessments designed to measure specific learning outcomes at a particular age or grade that are considered relevant for national policymakers. They also include cross-national initiatives (either regional or global) that are based on a common, agreed-upon framework and follow similar procedures to yield comparable data on learning outcomes. Assessment data can also be collected from households.

✓   Financial and expenditure data include information on government spending on education. Examples include construction and maintenance of schools, teacher salaries, and household spending on education, including supplies, transport and other costs. These data are very incomplete, in general, which makes it almost impossible to calculate allocative efficiency and equity.

✓ Several critical gaps are plaguing the current international monitoring dashboard. Some parts of the education system are not well covered. Some populations are excluded and, finally, some aspects of education simply do not have a source of data.

Annex II. Data production by country for Indicator 4.1.1 and household surveys

Figure A-1. Data production for learning outcomes, Indicator 4.1.2, 2010-2016

Administration of learning assessments, by country, 2010-2016
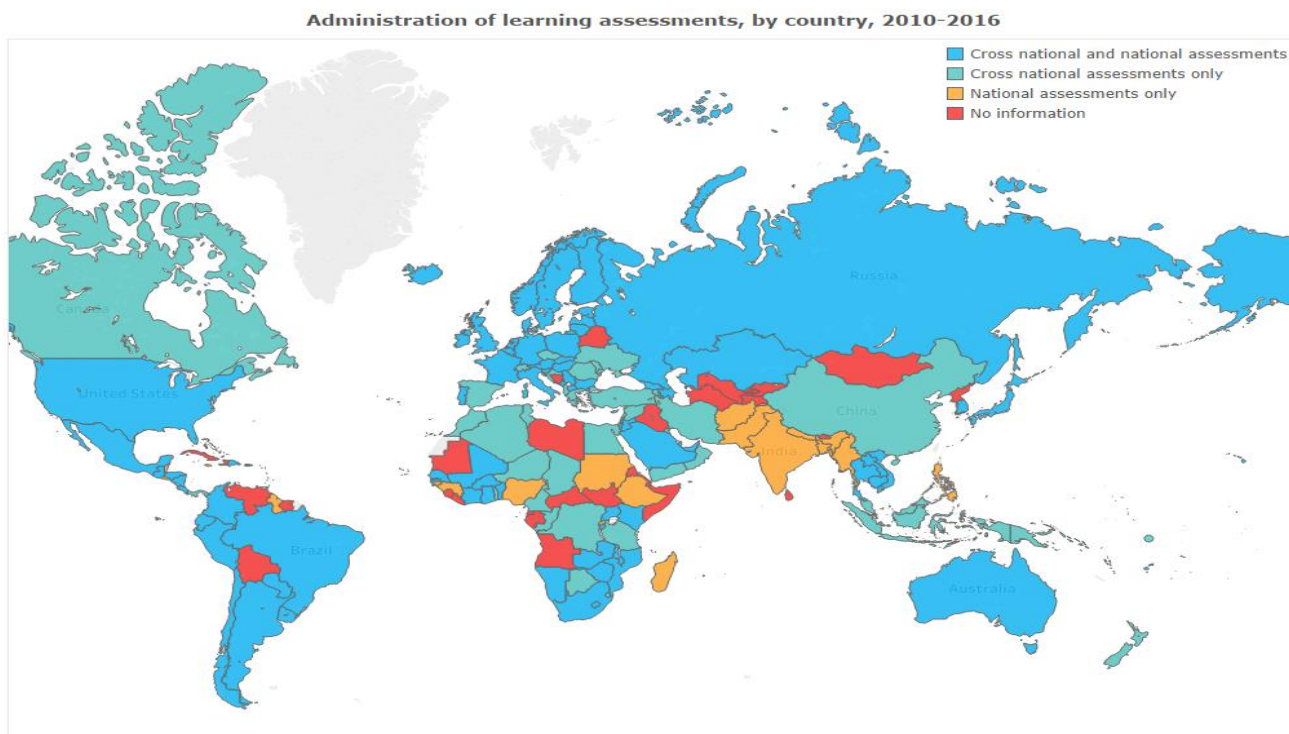
Notes: The cross-national assessments are Pacific Islands Literacy and Numeracy Assessment (PILNA), Progress in International Reading Literacy Study (PIRLS), Programme for International Student Assessment (PISA), Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ), Tercer Estudio Regional Comparativo y Explicativo (TERCE) and Trends in International Mathematics and Science Study (TIMSS). The UIS Catalogue of Learning Assessments is the source of information for national assessments.

Sources: Conference of Education Ministers of Francophone Countries across the World (CONFEMEN), Educational Quality and Assessment Programme International of the Pacific Community, International Association for the Evaluation of Educational Achievement (IEA), Latin American Laboratory for Assessment of the Quality of Education (LLECE), Organisation for Economic Co-operation and Development (OECD), Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) and UNESCO Institute for Statistics.

Figure A-2. Data production for household surveys, 2010-2016

Administration of household surveys, by country, 2010-2016
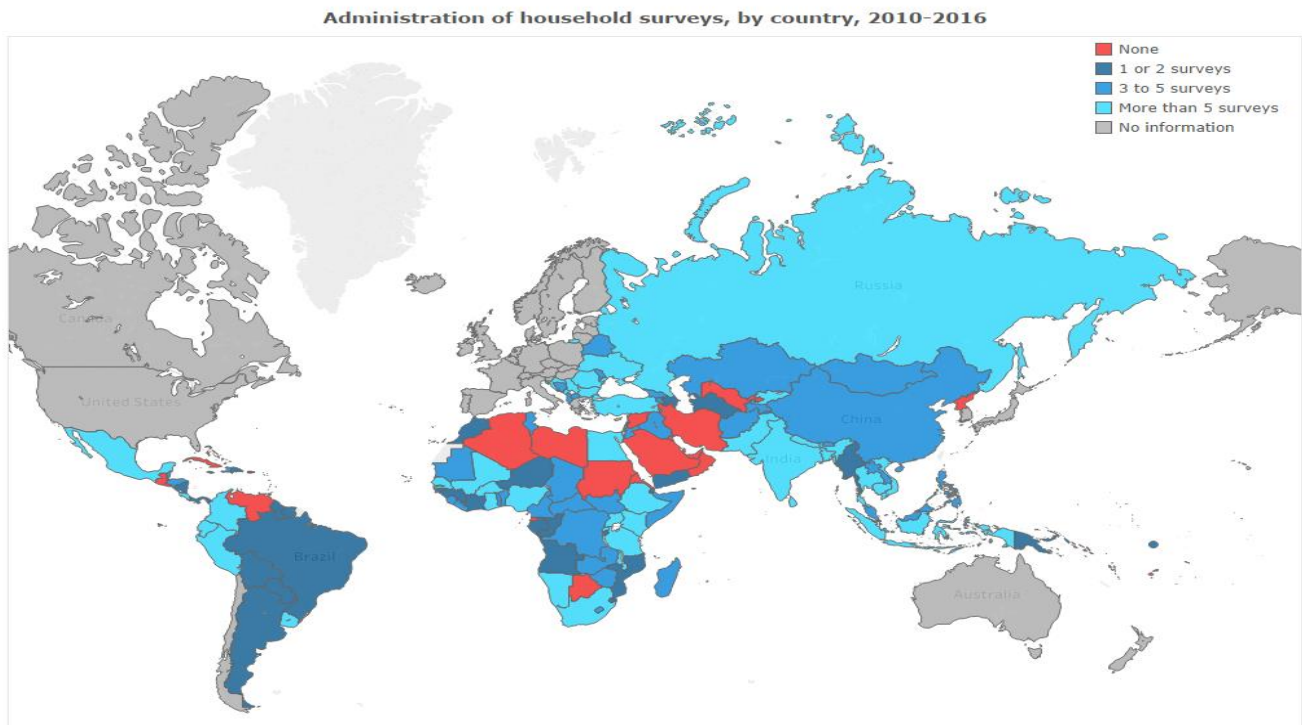
Source: Data on household surveys come from the International Household Survey Network (http://www.ihsn.org/), November 2017.

Annex III. Global and thematic indicators for the follow and review of the Education 2030 Agenda

Pale blue shading = global indicators
Red font = modifications by TCG to original list of 43 thematic indicators presented in the Education 2030 Framework for Action

Target 4.1 By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes		For reporting in 2017	Requires further development
4.1.1	Proportion of children and young people (a) in Grade 2 or 3; (b) at the end of primary education; and (c) at the end of lower secondary education achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex	YES	YES
4.1.2	Administration of a nationally-representative learning assessment (a) in Grade 2 or 3; (b) at the end of primary education; and (c) at the end of lower secondary education	YES	
4.1.3	Gross intake ratio to the last grade (primary education, lower secondary education)	YES	
4.1.4	Completion rate (primary education, lower secondary education, upper secondary education)	YES	
4.1.5	Out-of-school rate (primary education, lower secondary education, upper secondary education)	YES	
4.1.6	Percentage of children over-age for grade (primary education, lower secondary education)	YES	
4.1.7	Number of years of (a) free and (b) compulsory primary and secondary education guaranteed in legal frameworks	YES	
Target 4.2 By 2030, 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		For reporting in 2017	Requires further development
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	YES	YES
4.2.2	Participation rate in organized learning (one year before the official primary entry age), by sex	YES	
4.2.3	Percentage of children under 5 years experiencing positive and stimulating home learning environments	NO	YES

		For reporting in 2017	Requires further development
4.2.4	Gross early childhood education enrolment ratio in (a) pre-primary education and (b) and early childhood educational development	YES	
4.2.5	Number of years of (a) free and (b) compulsory pre-primary education guaranteed in legal frameworks	YES	
Target 4.3 By 2030, ensure equal access for all women and men to affordable quality technical, vocational and tertiary education, including university		For reporting in 2017	Requires further development
4.3.1	Participation rate of youth and adults in formal and non-formal education and training in the previous 12 months, by sex	YES	YES
4.3.2	Gross enrolment ratio for tertiary education by sex	YES	
4.3.3	Participation rate in technical-vocational programmes (15- to 24-year-olds) by sex	YES	
Additional areas for development: affordability, quality		Not applicable	YES
Target 4.4 By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship		For reporting in 2017	Requires further development
4.4.1	Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill	YES	YES
4.4.2	Percentage of youth/adults who have achieved at least a minimum level of proficiency in digital literacy skills	NO	YES
4.4.3	Youth/adult educational attainment rates by age group, economic activity status, levels of education and programme orientation	YES	YES to simplify
Additional areas for development: measures of a broader range of work-related skills than ICTs, other employment-related indicators		Not applicable	YES
Target 4.5 By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations		For reporting in 2017	Requires further development
4.5.1	Parity indices (female/male, rural/urban, bottom/top wealth quintile and others such as disability status, indigenous peoples and conflict-affected, as data become available) for all education indicators on this list that can be disaggregated	YES	

4.5.2	Percentage of students in primary education whose first or home language is the language of instruction	NO	YES
4.5.3	Extent to which explicit formula-based policies reallocate education resources to disadvantaged populations	NO	YES
4.5.4	Education expenditure per student by level of education and source of funding	YES	
4.5.5	Percentage of total aid to education allocated to least developed countries	YES	
Target 4.6 By 2030, ensure that all youth and aa substantial proportion of adults, both men and women, achieve literacy and numeracy		For reporting in 2017	Requires further development
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	YES	YES
4.6.2	Youth/adult literacy rate	YES	
4.6.3	Participation rate of illiterate youth/adults in literacy programmes	NO	YES
Target 4.7 By 2030, ensure all learners acquire knowledge and skills needed to promote sustainable development, including among others through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity and of culture's contribution to sustainable development		For reporting in 2017	Requires further development
4.7.1	Extent to which (i) global citizenship education and (ii) education for sustainable development, including gender equality and human rights, are mainstreamed at all levels in: (a) national education policies, (b) curricula, (c) teacher education and (d) student assessment	YES	YES
4.7.2	Percentage of schools that provide life skills-based HIV and sexuality education	NO	YES
4.7.3	Extent to which the framework on the World Programme on Human Rights Education is implemented nationally (as per the UNGA Resolution 59/113)	NO	YES
4.7.4	Percentage of students by age group (or education level) showing adequate understanding of issues relating to global citizenship and sustainability	NO	YES
4.7.5	Percentage of 15-year-old students showing proficiency in knowledge of environmental science and geoscience	NO	YES
Additional areas for development: attitudes and values, life-long learning/non-formal, qualitative indicators		Not applicable	YES

Target 4.a Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all		For reporting in 2017	Requires further development
4.a.1	Proportion of schools with access to: (a) electricity; (b) Internet for pedagogical purposes; and (c) computers for pedagogical purposes	YES	
	(d) adapted infrastructure and materials for students with disabilities		YES
	(e) basic drinking water; (f) single-sex basic sanitation facilities; and (g) basic handwashing facilities (as per the WASH indicator definitions)		
4.a.2	Percentage of students experiencing bullying, corporal punishment, harassment, violence, sexual discrimination and abuse	NO	YES
4.a.3	Number of attacks on students, personnel and institutions	NO	YES
Additional areas for development: expenditure, national quality standards		Not applicable	YES
Target 4.b By 2020, substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education, including vocational training, information and communications technology, technical, engineering and scientific programmes in developed countries and other developing countries		For reporting in 2017	Requires further development
4.b.1	Volume of official development assistance flows for scholarships by sector and type of study	YES	
4.b.2	Number of higher education scholarships awarded, by beneficiary country	NO	YES
Additional areas for development: support for marginalised students		Not applicable	YES
Target 4.c By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing States		For reporting in 2017	Requires further development
4.c.1	Proportion of teachers in: (a) pre-primary education; (b) primary education; (c) lower secondary education; and (d) upper secondary education who have received at least the minimum organized teacher training (e.g. pedagogical training) pre-service or in-service required for teaching at the relevant level in a given country, by sex	YES	
4.c.2	Pupil-trained teacher ratio by education level	YES	

4.c.3	Proportion of teachers qualified according to national standards by education level and type of institution	YES	
4.c.4	Pupil-qualified teacher ratio by education level	YES	
4.c.5	Average teacher salary relative to other professions requiring a comparable level of qualification	NO	YES
4.c.6	Teacher attrition rate by education level	YES	
4.c.7	Percentage of teachers who received in-service training in the last 12 months by type of training	NO	YES

Annex IV. Global and thematic Indicators by source of information

Target	Concept	Indicator		Availability at UIS	Source	
					UIS Surveys	External data
4.2 Early childhood development and pre-primary education	Readiness	8*	Proportion of children of under 5 years of age who are developmentally on track in health, learning and psychosocial well-being, by sex	No	No	Household surveys
		9	Percentage of children under 5 years of age experiencing positive and stimulating home learning environments	No	No	Household surveys
	Participation	10*	Participation rate in organized learning (one year before official primary entry age), by sex	No	Yes	Population data
		11	Gross pre-primary enrolment ratio	Yes	Yes	Population data
	Provision	12	Number of years of (i) free and (ii) compulsory pre-primary education guaranteed in legal frameworks	Yes	Yes	-
4.3 Technical, vocational and tertiary education	Participation	13	Gross enrolment ratio for tertiary education	Yes	Yes	Population data
		14	Participation rate in technical-vocational education programmes (15- to 24-year-olds)	Yes (partial)	Yes	Population data
		15*	Participation rate of youth and adults in formal and non-formal education and training in the previous 12 months, by sex	No	No	Household surveys

Target	Concept	Indicator		Availability at UIS	Source	
					UIS Surveys	External data
4.4 Skills for employment, decent jobs and entrepreneurship	Skills	16.1	Percentage of youth/adults who have achieved at least a minimum level of proficiency in digital literacy skills	No	No	Learning assessments /other surveys
		16.2*	Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill	No	No	Household surveys (HHS)
		17	Youth/adult educational attainment rates by age group, economic activity status, levels of education and programme orientation	Yes (partial)	Yes	-
4.6 Equity	…	*	Parity indices (female/male, rural/urban, bottom/top wealth quintile and others such as disability status and conflict-affected, as data become available) for all education indicators on this list that can be disaggregated	Yes (only by sex)	Depends on the indicator	Depends on the indicator
	Policy	18	Percentage of students in primary education whose first or home language is the language of instruction	No	Could be adapted to include	Learning assessment/HHS
		19	Extent to which explicit formula-based policies reallocate education resources to disadvantaged populations	No	No	-
		20	Education expenditure per student by level of education and source of funding	Yes	Yes	
		21	Percentage of total aid to education allocated to low-income countries primary cycle, expressed as a percentage of the actual number of pupil-years).	No	No	OECD
4.6 Literacy	Skills	22*	Percentage 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	No	No	Learning assessments /other surveys
		23	Youth/adult literacy rate	Yes	Yes	-
	Provision	24	Participation rate of youth/adults in literacy programmes	No	Could be adapted to include	Ideally HHS

Target	Concept	Indicator		Availability at UIS	Source	
					UIS Surveys	External data
4.7 Education and sustainable development	Knowledge	25*	Extent to which (i) global citizenship education and (ii) education for sustainable development, including gender equality and human rights, are mainstreamed at all levels in: (a) national education policies, (b) curricula, (c) teacher education and (d) student assessment	No	No	UNESCO survey
		26	Percentage of students by age group (or education level) showing adequate understanding of issues relating to global citizenship and sustainability	No	No	Learning assessments /other surveys
		27	Percentage of 15-year-old students showing proficiency in knowledge of environmental science and geoscience	No	No	Learning assessments /other surveys
	Provision	28	Percentage of schools that provide life skills-based HIV and sexuality education	No	No, could possibly be adapted to include	School-based surveys
		29	Extent to which the framework on the World Programme on Human Rights Education is implemented nationally (as per UNGA Resolution 59/113)	No	No	OHCHR

Target	Concept	Indicator		Availability at UIS	Source	
					UIS Surveys	External data
4.a Education facilities	Resources	30*	Proportion of schools with access to: (a) basic drinking water; (b) single-sex basic sanitation facilities; and (c) basic hand-washing facilities (as per the WASH indicator definitions)	Yes (partial - (c) is being collected for the first time in 2016)	Yes (currently for Africa only)	-
		31*	Proportion of schools with access to: (a) electricity; (b) the Internet access for pedagogical purposes; and (c) computers for pedagogical purposes	Yes	Yes	-
		32*	Proportion of school with access to: (a) adapted infrastructure and materials for students with disabilities	No	No, could possibly be adapted to include	School-based surveys
	Environment	33	Percentage of students experiencing bullying, corporal punishment, harassment, violence, sexual discrimination and abuse	No	No	School-based surveys
		34	Number of attacks on students, personnel and institutions	No	No	Other surveys
4.b Scholarships	Number	35	Number of higher education scholarships awarded by beneficiary country	No	No	Other surveys
		36*	Volume of official development assistance flows for scholarships by sector and type of study	No	No	OECD-DAC
4.c Teachers	Qualified	37	Percentage of teachers qualified according to national standards by education level and type of institution	Yes	Yes	-
		38	Pupil/qualified teacher ratio by education level	Yes	Yes	-
	Trained	39*	Proportion of teachers in (a) pre-primary; (b) primary; (c) lower secondary; and (d) upper secondary who have received at least the minimum organized teacher training (e.g. pedagogical training) pre-service and in-service required for teaching at the relevant level in a given country	Yes	Yes	-
		40	Pupil/trained teacher ratio by education level	Yes	Yes	-
	Motivated	41	Average teacher salary relative to other professions requiring a comparable level of education qualification	No	No, could possibly be adapted to include data on	Data on average qualifica-tions and salaries of

Target	Concept	Indicator		Availability at UIS	Source	
					UIS Surveys	External data
					teachers' salaries	other profes-sions
		42	Teacher attrition rate by education level	Yes	Yes	-
	Supported	43	Percentage of teachers who received in-service training in the last 12 months by type of training	No	No	School-based surveys

Annex V. Coverage rate by indicator

Indicator	Label	Coverage rate
4.1.1	Proportion of children and young people achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex	24
	(a) in Grade 2 or 3	12
	(b) at the end of primary education; and	23
	(c) at the end of lower secondary education	33%
4.1.2	Administration of a nationally-representative learning assessment (a) in Grade 2 or 3; (b) at the end of primary education; and (c) at the end of lower secondary education	48%
4.1.3	Gross intake ratio to the last grade (primary education, lower secondary education)	83%
4.1.4	Completion rate (primary education, lower secondary education, upper secondary education)	39%
4.1.5	Out-of-school rate (primary education, lower secondary education, upper secondary education)	73%
4.1.6	Percentage of children over-age for grade (primary education, lower secondary education)	82%
4.1.7	Number of years of (a) free and (b) compulsory primary and secondary education guaranteed in legal frameworks	97%
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	27%
4.2.2	Participation rate in organized learning (one year before the official primary entry age), by sex	72%
4.2.3	Percentage of children under 5 years experiencing positive and stimulating home learning environments	28%
4.2.4	Gross early childhood education enrolment ratio in (a) pre-primary education and (b) and early childhood educational development	86%
4.2.5	Number of years of (a) free and (b) compulsory pre-primary education guaranteed in legal frameworks	97%
4.3.1	Participation rate of youth and adults in formal and non-formal education and training in the previous 12 months, by sex	15%
4.3.2	Gross enrolment ratio for tertiary education by sex	79%
4.3.3	Participation rate in technical-vocational programmes (15- to 24-year-olds) by sex	70%
4.4.1	Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill	18%
4.4.2	Percentage of youth/adults who have achieved at least a minimum level of proficiency in digital literacy skills	8%
4.4.3	Youth/adult educational attainment rates by age group, economic activity status, levels of education and programme orientation	48%

Indicator	Label	Coverage rate
4.5.1	Parity indices (female/male, rural/urban, bottom/top wealth quintile and others such as disability status, indigenous peoples and conflict-affected, as data become available) for all education indicators on this list that can be disaggregated	30%
4.5.2	Percentage of students in primary education whose first or home language is the language of instruction	0%
4.5.3	Extent to which explicit formula-based policies reallocate education resources to disadvantaged populations	0%
4.5.4	Education expenditure per student by level of education and source of funding	51%
4.5.5	Percentage of total aid to education allocated to least developed countries	
4.6.1	Percentage 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	13%
4.6.2	Youth/adult literacy rate	57%
4.6.3	Participation rate of illiterate youth/adults in literacy programmes	5%
4.7.1	Extent to which (i) global citizenship education and (ii) education for sustainable development, including gender equality and human rights, are mainstreamed at all levels in: (a) national education policies, (b) curricula, (c) teacher education and (d) student assessment	0%
4.7.2	Percentage of schools that provide life skills-based HIV and sexuality education	0%
4.7.3	Extent to which the framework on the World Programme on Human Rights Education is implemented nationally (as per the UNGA Resolution 59/113)	0%
4.7.4	Percentage of students by age group (or education level) showing adequate understanding of issues relating to global citizenship and sustainability	0%
4.7.5	Percentage of 15-year-old students showing proficiency in knowledge of environmental science and geoscience	0%
4.a.1	Proportion of schools with access to: (a) electricity; (b) Internet for pedagogical purposes; and (c) computers for pedagogical purposes; Proportion of schools with access to: (d) adapted infrastructure and materials for students with disabilities; Proportion of schools with access to: (e) basic drinking water; (f) single-sex basic sanitation facilities; and (g) basic handwashing facilities (as per the WASH indicator definitions)	21%
4.a.2	Percentage of students experiencing bullying, corporal punishment, harassment, violence, sexual discrimination and abuse	24%
4.a.3	Number of attacks on students, personnel and institutions	0%
4.b.1	Volume of official development assistance flows for scholarships by sector and type of study	70%
4.b.2	Number of higher education scholarships awarded by beneficiary country	0%
4.c.1	Proportion of teachers in: (a) pre-primary education; (b) primary education; (c) lower secondary education; and (d) upper secondary education who have received at least the minimum organized teacher training (e.g. pedagogical training) pre-service or in-service required for teaching at the relevant level in a given country, by sex	44%

Indicator	Label	Coverage rate
4.c.2	Pupil-trained teacher ratio by education level	44%
4.c.3	Proportion of teachers qualified according to national standards by education level and type of institution	37%
4.c.4	Pupil-qualified teacher ratio by education level	36%
4.c.5	Average teacher salary relative to other professions requiring a comparable level of qualification	0%
4.c.6	Teacher attrition rate by education level	6%
4.c.7	Percentage of teachers who received in-service training in the last 12 months by type of training	0%
	All Indicators (average)	**41%**

Annex VI. Assumption and unit costs

The costs include economic and non-economic costs the economic costs run from methodological developments to non-economic costs. Data collection, etc.). Costs are presented by indicator, by target and by type of source of information. The following assumptions were made:

1. *Only costs that are __not__ the ongoing costs of institutions with budgets for already-performed key tasks are considered.* Tasks that __add__ to the work of such institutions are counted. And any completely new tasks are counted. Thus, for example, ongoing cost of EMIS offices in countries, or cost of UIS in compiling, indicators that are already compiled (such as the "completion rate"), are not included.

2. *Innovations and improvements, in measurement of existing indicators, and one-off costs of adding new indicators, are included, according to level of income of the country*. "Cash" costs, even if for repeat applications of ongoing efforts (e.g. repeat applications of an international assessment) are counted and not considered as routine. The idea is to leave out the routine, ongoing budgets of both local and global organizations that are already producing known goods.

3. *It is assumed that the education sector is not budgeting for the cost of data that are needed but are normally supplied by other sectors.* This includes demographic data and "raw" financial data. It is a major assumption, as the unavailability of some key data may hamper some indicator production. However, there is little that the education sector can do about it, even if the budget could be made available, due to authorization or mandate issues.

4. *Core support of institutions for new tasks is assumed to be built up as driven by the need for new indicators, and new capacities*; they are not "plug" numbers for general support. The main categories of cost are assumed to be "self-funded" (for example, ongoing EMIS-type activities in all countries, new activities of all types in high- and upper-middle-income countries) and "aid-funded."

5. Other categories seem more confusing than beneficial. In particular, whether costs are paid out to international organizations can get confusing, as many of those costs, might get spent or stay within country. The issue is whether countries can self-finance. We could try to include, but it seems like a potentially misleading issue, and it does not help drive the ultimate estimate of cost that international agencies ought to be prepared for.

6. *Costs are not further disaggregated into constituent inputs of labour, transport, per diems, etc*. It is assumed that, for instance, certain workshops will, of course, require labour, transport, and per diem, but the global cost of the workshop is listed. In that case, the lowest-level accounting unit is "a workshop." In the case of support for institutions that underpin methodological development or add value to data, it may be assumed that most of the cost is labour; and so on.

7. The SDG are a massive effort from countries, therefore to provide a somewhat realistic picture, it is assumed that not all countries will immediately test the full scope. The main scenario assumes *that country participation will "ramp up."*

   o For some indicators or activities, at first, there may be countries not participating. It is assumed that by 2030 all countries participate. This will vary by indicator. It would be too difficult to make calculations year by year.

   o Thus, to keep matters simple, we have made it possible to offer a calculations for the number of countries likely to be participating "on average" over the period 2020 to 2030. This is not simply the midpoint of a ramp-up from 0 to 100%, as in some cases much more than 0% currently participate, and in most cases the ramp-up should be expected to be non-linear.

   o The default or baseline assumption is that all countries will "instantaneously" take up any funding offer for learning assessments or EMIS improvements, but this may not be realistic. The costing exercise could simulate a more gradual ramp-up that speeds up as the years go by.

   o All countries would carry out assessments in literacy and numeracy during primary, at the end of primary, and at the end of lower secondary, as well as for youth and adults. In addition, skills in ICT, global citizenship, and environmental issues.

   o However, not all countries are assumed to self-fund these assessments. It would also be possible to simulate a gradual ramp-up, assuming not all countries can start up all these assessments at the same time. For now it is assumed that they can start at the same time.

8. In the cost categorization (basic cost components) it is assumed that field applications of key instruments already carry the workshops and training costs. Workshop and other such costs are thus accounted for separately only when they are the only input in an activity, or are a key methodological precursor to field applications.

9. It is assumed that global or regional agreement and methodological workshops need to be explicitly budgeted only as a one-off cost in the initial period lasting one or two years (and in some cases occasionally, again, after a few years), and that organizations will typically learn to pay for their participation in such workshops out of the budget or revenue they derive from implementation, once implementation starts. This assumption could be altered.

10. In learning assessments, it is assumed that the cost of capacity building is built into the cost of participation.

11. It is assumed that most if not all of important data such as completion rates, that could be derived from administrative data plus population data, will also be asked in household surveys.

12. It is assumed that all indicators that require disaggregation will be gathered with the necessary background information, to the extent possible, in household surveys and administrative data. Thus the data-gathering cost is already included. Disaggregation, calculation of parity indices, reporting will be, however, an, added-value feature that will increase the cost of global agencies and will be modelled as such.

13. If one pays attention to the thematic indicators (or even some global ones), it is clear that most existing surveys will not accept the addition of so many questions.

     o Thus, if one is to be complete and include many of the thematic indicators, it is likely that new surveys will be needed.

     o And it should be clear that it will be much less expensive to create omnibus surveys to take care of many of these issues at once, rather than to prepare special-purpose surveys for each issue.

     o This is the assumption that will be made for the % of indicators that need to be gathered via surveys, or that one wishes to confirm with surveys.

14. *However, the important assumption will be made that to draft the methodological aspects of certain aspects of these surveys, sep*arate expert meetings will be needed, per theme, even if the data are actually gathered via "omnibus" surveys. Thus, there would be some up-front costs in finalising methodology.

15. It is assumed that certain indicators that are a matter of policy (such as whether the framework on the World Programme on Human Rights Education is implemented) are derived by a combination of key informants and spot-checks, not through HH or facilities surveys.

     o The "key informant" cost category will therefore budget for some spot checks. **This could be changed either to use key informants and reporters only (least expensive), or to include in facilities surveys (more expensive).**

16. For important indicators, those that are gathered via key informant and spot checks may be duplicated with household or facilities surveys.

17. Costs were disaggregated between aid-funded and self-funded and by level of income of countries.

50	(Approximate cash cost of a 1-week workshop in per diems, transport, and venue.)
25	(Approximate cash cost of 1 person month of technical assistance, including fringe benefits, relevant overheads, etc., including non-labor costs.)
150	(Approximate cash cost of a 1-week workshop in per diems, transport, and venue.)
100	(Approximate 2-day global or regional workshop requring cash costs for countries and/or less well-financed NGOs)
50	(Per survey, not per issue or theme)
5	(Per survey, not per issue or theme)
500	(Per survey, not per issue or theme, it is assumed that training costs are part of the cost of participation.)
500	Many assessments do not use this default. It is assumed that training costs are part of the cost of participation
200	(Yearly salary for mid-senior level, including fringe benefits, overheads, etc.)
15	(Assumed cost per country per year of application for accessing 20 days of key informant time per year, plus a 10-school spot-check for all key issues, not per issue. Cost is average across all countries but assuming labor of international caliber.)
20	(One-off equipment and other support for an EMIS office, repeatable every 5 years only in selected LI settings.)