SUSTAINABLE DEVELOPMENT DATA DIGEST

# LAYING THE FOUNDATION TO MEASURE SUSTAINABLE DEVELOPMENT GOAL 4

United Nations
Educational, Scientific and
Cultural Organization

UNESCO INSTITUTE for STATISTICS

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INSTITUTE
*for*
STATISTICS

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Published in 2016 by:
UNESCO Institute for Statistics
P.O. Box 6128, Succursale Centre-Ville
Montreal, Quebec H3C 3J7
Canada
Tel: (1 514) 343-6880
Email: uis.publications@unesco.org
http://www.uis.unesco.org



Ref. UIS/2016/SDG/TD/10
ISBN 978-92-9189-197-9
DOI: http://dx.doi.org/10.15220/978-92-9189-197-9-en

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# Acronyms & abbreviations

| | |
|---|---|
| ACER-GEM | Australian Council for Educational Research Centre for Global Education Monitoring |
| ALL | Adult Literacy and Lifeskills |
| ASER | Annual Status of Education Report |
| CCSA | Committee for the Coordination of Statistical Activities |
| CGIAR | Consultative Group for International Agricultural Research |
| CIL | Computer and information literacy |
| CONFEMEN | *Conférence des Ministres de l'Éducation des Etats et Gouvernements de la Francophonie* |
| CSO | Civil society organization |
| CSR | Country status reports |
| CUE | Center for Universal Education, Brookings Institution |
| DHS | Demographic and Health Survey |
| DME-WIDE | Deprivation and Marginalization in Education dataset-World Inequality Database on Education |
| DQAF | Data quality assurance framework |
| E2030 FFA | Education 2030 Framework for Action |
| EAP-ECDS | East Asia-Pacific Early Child Development Scales |
| ECCE | Early childhood care and education |
| ECD | Early childhood development |
| ECDI | Early Child Development Index |
| ECLAC | Economic Commission for Latin America and the Caribbean |
| ECOSOC | United Nations Economic and Social Council |
| ED/ESC | Education Sector Division for Education 2030 Support and Coordination, UNESCO |
| EDI | Early Development Instrument |
| EFA | Education For All |
| EMIS | Education management information system |
| ESD | Education for sustainable development |
| ESSI | Education Statistical Services Institute |
| GAL | Global Alliance for Literacy |
| GAML | Global Alliance to Monitor Learning |
| GCED | Global citizenship education |
| GEMR | Global Education Monitoring Report |
| GMR | Global Monitoring Report |
| IAEG-SDGs | Inter-agency and Expert Group on SDG Indicators |
| IAG-EII | Inter-Agency Group on Education Inequality Indicators |
| IALS | International Adult Literacy Survey |
| ICCS | International Civic and Citizenship Education Study |
| ICILS | International Computer and Information Literacy Study |
| ICPD | International Conference on Population and Development |
| ICT | Information and communication technologies |
| IDELA | International Development and Early Learning Assessment |
| IEA | International Association for the Evaluation of Education Achievement |
| ILO | International Labour Organization |
| ISCED | International Standard Classification of Education |

| | |
|---|---|
| ISWGSH | Intersecretariat Working Group on Household Surveys |
| ITU | International Telecommunication Union |
| LACI | Learning Assessment Capacity Index |
| LAMP | Literacy Assessment and Monitoring Programme |
| LLECE | *Laboratorio Latinoamericano de Evaluación de la Calidad de la Educación* |
| LMP | Learning Metric Partnership |
| LMTF | Learning Metrics Task Force |
| LSMS | Living Standards Measurement Study |
| LSO | Labour Market, Economic and Social Outcomes of Learning |
| MDG | Millennium Development Goals |
| MELQO | Measuring Early Learning Quality and Outcomes |
| MICS | Multiple Indicator Cluster Survey |
| MOE | Ministry of Education |
| NEA | National education account |
| NCES | National Center for Education Statistics |
| NESLI | Network for the Collection and Adjudication of System-Level Descriptive Information on Educational Structures, Policies and Practices |
| NESS | National education statistical system |
| NGO | Non-governmental organization |
| NSDES | National strategies for the development of education statistics |
| NSDS | National strategies for the development of statistics |
| NSO | National statistics office |
| ODA | Official development assistance |
| OECD | Organisation for Economic Co-operation and Development |
| OHCHR | Office of the High Commissioner for Human Rights |
| PARIS21 | Partnership in Statistics for Development in the 21st Century |
| PASEC | *Programme d'analyse des systèmes éducatifs de la CONFEMEN* (Analysis Programme of the CONFEMEN Education Systems) |
| PER | Public expenditure review |
| PIAAC | Programme for the International Assessment of Adult Competencies |
| PILNA | Pacific Islands Literacy and Numeracy Assessment |
| PIRLS | Progress in International Reading Literacy Study |
| PISA | Programme for International Student Assessment |
| PRIDI | *Programa Regional de Indicadores de Desarrollo Infantil* (Regional Program on Child Development Indicators) |
| RAAMA | *Recherche-action sur la mesure des apprentissages des bénéficiaires des programmes d'alphabétisation* (Action Research: Measuring Literacy Programme Participants' Learning Outcomes) |
| SABER | Systems Approach for Better Education Results |
| SACMEQ | Southern and Eastern Africa Consortium for Monitoring Educational Quality |
| SDG | Sustainable Development Goal |
| SDMX | Statistical Data and Metadata eXchange |
| SERCE | *Segundo Estudio Regional Comparativo y Explicativo* (Second Regional Comparative and Explanatory Study) |
| SLS | Short Literacy Survey |
| SNA | System of National Accounts |

| | |
|---|---|
| STEP | Skills towards Employment and Productivity |
| TAG | Technical Advisory Group on post-2015 education indicators |
| TCG | Technical Cooperation Group |
| TERCE | *Tercer Estudio Regional Comparativo y Explicativo* (Third Regional Comparative and Explanatory Study) |
| TIMSS | Trends in International Mathematics and Science Study |
| TransMonEE | Transformative Monitoring Enhanced Equity database |
| TRE | Technology-rich environment |
| TVET | Technical and vocational education and training |
| UIS | UNESCO Institute for Statistics |
| UIL | UNESCO Institute for Lifelong Learning |
| ULS | Universal learning scale |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| UNICEF | United Nations Children's Fund |
| UNSC | United Nations Statistical Commission |
| UNSD | United Nations Statistics Division |
| UNSG | United Nations Secretary General's Synthesis Report |
| USAID | United States Agency for International Development |
| WASH | Water, Sanitation and Hygiene |
| WBG | World Bank Group |
| WIDE | World Inequality Database on Education |

# Foreword

The Sustainable Development Goals (SDGs) and the Education 2030 Framework for Action are aimed at changing conditions on the ground. This means providing opportunities for all to acquire and apply the knowledge and skills that empower individuals to reach their potential and strengthen their societies and economies. To achieve this ambition, measurement and monitoring are vital to inform the policies needed by a range of national and international stakeholders working to make a real and positive impact on people's lives.

The Agenda for Sustainable Development has two central policy pillars for education. The first is a strong focus on monitoring and improving learning outcomes. The second pillar focuses on those who are left behind—and often remain hidden. Socially responsible statistics help to ensure that everyone is counted so that their needs can be addressed.

In many respects, the education sector has moved rapidly to set up the consultation mechanisms and technical partnerships required to carry out global and thematic monitoring. It has already been effective in identifying strategies to enable national institutions to strengthen their support for increased technical capacity in education. Similar efforts are underway in other sectors, such as energy, environment and health.

This report offers a roadmap for better measurement. It is the first in a new series of publications that reflects the mandate of the UNESCO Institute for Statistics (UIS) to produce comparable education indicators cross-nationally and to work with partners to develop new indicators, statistical approaches and monitoring tools to better assess progress towards education targets. This new series will report annually on the progress made towards better measurement and use of data. It will examine areas that are difficult to measure, while sharing good practices, especially in relation to education quality and equity.

This series, the *Sustainable Development Data Digest,* also documents how key targets and indicators were developed through a country-led process guided by a global and thematic expert and advisory group. At the same time, this report shows how the United Nations and the UIS can act as "neutral brokers" in working with countries to produce the standards and tools they need to implement and monitor progress towards the SDGs.

To implement the new measurement agenda, countries need national and international statistical frameworks comprised of classifications, definitions and standards. They also urgently require tools, such as data quality assessments and mapping of education information systems, to improve the quality and coverage of their data. These are essential to produce the robust data and evidence needed by a wide range of national and international stakeholders to design, target and evaluate policy interventions while charting progress towards the development goals.

Will the SDGs change the world in 15 years? Rapid change is possible if it starts from within the system as a response to national policies and priorities. Support to countries making the effort to institute and anchor their measurement capacity within their national education systems could play a significant role in achieving these ambitious goals.

**Silvia Montoya**
**Director, UNESCO Institute for Statistics**

# Introduction

The launching of the new 2030 Agenda for Sustainable Development and its indicator framework to monitor progress marks a critical moment in global development. But what will it measure and how were the indicators chosen? What are the implications for national education data and information systems—and are they ready to monitor such an ambitious agenda that prioritises education quality and equity? What are the barriers that countries face in producing and using good quality data? And what initiatives on the national and international level could help build greater technical capacity, and mobilise attention and resources for the measurement needed to ensure a strong link between the data gathered and the national plans and policy objectives they are meant to inform?

The basic principles for the global process have been established for SDG 4 on education. These and parallel efforts within the education community since 2014 culminated in the Education 2030 Framework for Action, which sets out guidelines for taking action in priority areas of education. When the framework was adopted by countries in November 2015, they specifically mandated the UIS to remain the official source of cross-nationally comparable data on education. It was also given the mandate to work with partners to develop new indicators, statistical approaches and monitoring tools to better assess progress across the targets.

This first UIS report to focus on SDG education indicators begins by describing, in Section 1, the definition of the global and thematic indicator frameworks. Section 2 focuses on the results of this exercise whereby United Nations (UN) and multi-stakeholder processes identified two levels and approaches to monitoring: the global and the thematic. These frameworks complement one another—one has a relatively small number of key measures to be monitored regularly at the global level, and the other has a more comprehensive framework that addresses a wider range of policy issues faced by the education sector in each country.

Section 3 looks at the contexts and barriers that national education data and information systems currently face in producing reliable information about education quality, learning, equity and financing. It presents the results of an assessment carried out with national education planners and statisticians in 121 countries to gauge their readiness to measure and monitor the SDG 4 indicators. It gives a clear picture of the capacity of information systems already in place and the challenges ahead in seeking more comprehensive monitoring of progress towards achieving the targets. It also suggests ways that countries and international partners could improve their data production chain and identifies the elements that are essential for improved statistical systems.

Section 4 sets out the roadmap for implementing the new measurement agenda and highlights some of the efforts undertaken by the UIS, countries and other partners to fill gaps in data availability, enhance data quality, ensure that data are used to inform education policy and planning, and to monitor progress towards the goals. The section looks at those indicators where further methodological work is needed. It also offers recommendations and next steps for advancing the measurement agenda, which will require collective action across a wide range of education stakeholders at both the national and international level.

# 1. The new global development compact and education

## 1.1 TOWARDS A BROADER AND MORE AMBITIOUS DEVELOPMENT AGENDA

The 2030 Agenda for Sustainable Development, reached by consensus among the countries of the world, became a reality in September 2015. The 2030 Agenda succeeds the Millennium Development Goals (MDGs), which were established in 2000 and meant to be achieved by 2015. The Sustainable Development Goals (SDGs) differ from the MDGs in several important ways. First, they were defined in a process led and owned by Member States, which defined the goals and targets as well as the framework to review progress along the way. In contrast, international agencies led the development of the MDGs, including the goals, targets and indicators.

The 17 goals and 169 targets that comprise the SDGs were adopted by Member States at the UN General Assembly (*see* ***Figure 1***). The education goal (SDG 4) is made up of ten targets, including three means of implementation that focus on how to achieve the outcomes described in the targets. It aims to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all".

Figure 1 highlights the ten education targets (SDG 4) as well as other targets where education-related issues are raised and indicators needed to monitor progress. Education is an important part of other goals related, for example, to public financing of basic services and policy/legal frameworks that guarantee educational opportunities and integration of different objectives (e.g. global citizenship, crisis response, environmental knowledge) into national education policies and curricula.

Progress in education is also linked to the achievement of other SDGs. Higher levels of educational attainment have been directly or indirectly associated with individual outcomes such as better livelihoods, healthier behaviours, greater environmental awareness and increased civic participation as well as positive social outcomes, such as economic growth and increased social cohesion.

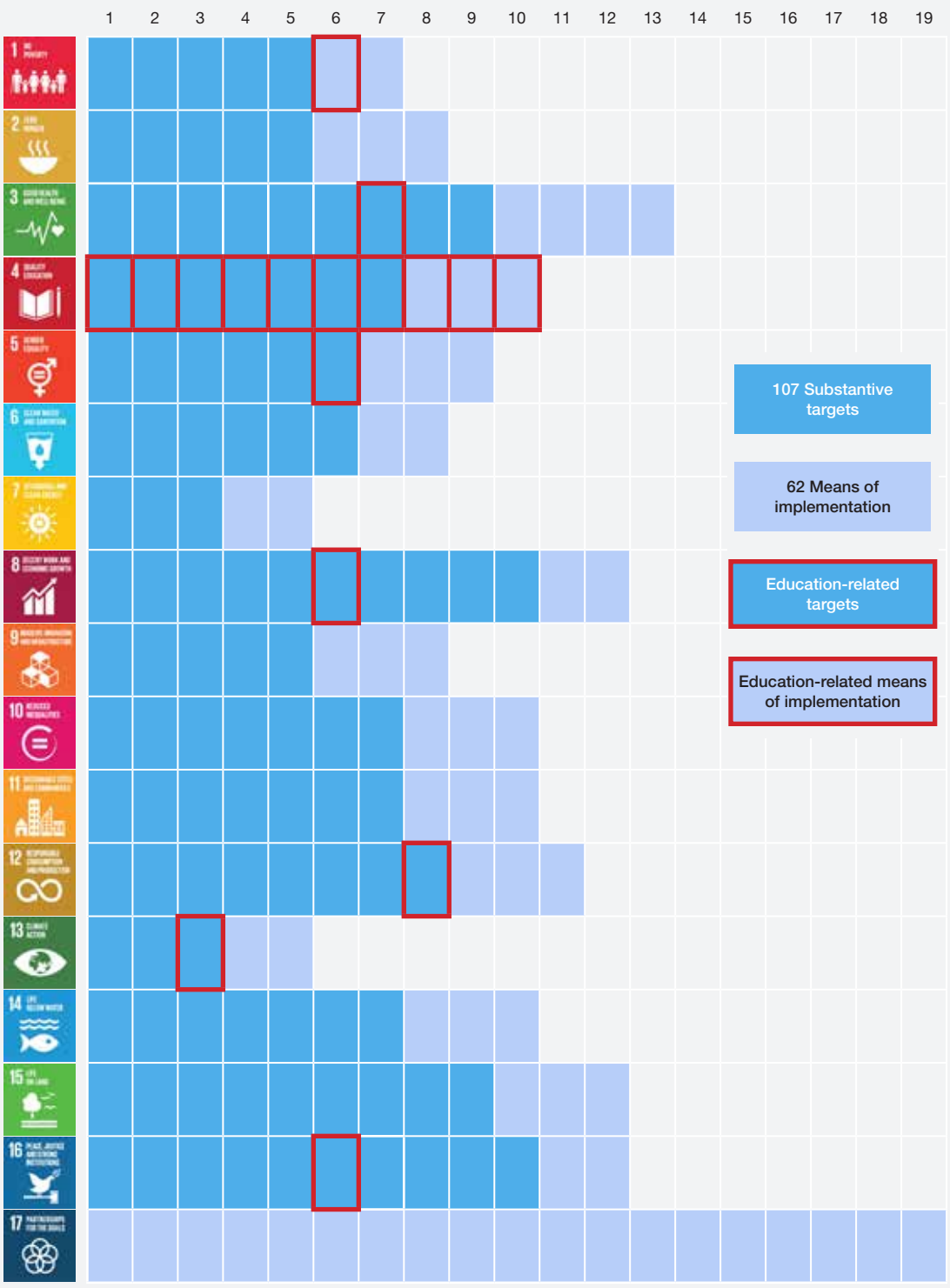
The SDGs are also more comprehensive in scope compared to the MDGs (*see* ***Figure 2***). For example, in education, SDG 4 covers learning from early childhood through adulthood, while stressing the key themes of education quality, learning, inclusion and equity. The MDGs for education highlighted only universal primary education and gender parity in participation by education level—leading some countries not to consider them directly relevant to their specific context. Thus, the SDGs stress the universality of the goals and targets for countries at every level of development.

### *The different levels of SDG monitoring*

The United Nations Secretary General's Synthesis Report (UNSG, 2014) recommended that four levels of monitoring should be considered – global, regional, thematic and national – with each one serving a different purpose, a different audience and comprising a varying number of indicators accordingly *(see* ***Figure 3****)*.

A key level of monitoring is national and it is likely to have the largest set of indicators in order to reflect the specificities of national education systems and local contexts. This monitoring should be linked

## Figure 1. Number of targets by Sustainable Development Goal




*Source: Pieter Everaers, 2016*

**Figure 2. Key differences between development agendas**



| 2000-2015 | Duration of compact | 2015-2030 |
|---|---|---|
| International organizations | Who defined targets/indicators? | Member States |
| Universal primary completion | Key concepts to measure | Lifelong learning and equity |
| Gender parity | Key equity concept | Gender and various disadvantaged groups |
| 1 (and gender parity) | How many education targets? | 10 (including means of implementation) |
| 3 to 5 | How many education indicators? | 11+ (not including disaggregation) |

*Source: UNESCO Institute for Statistics*

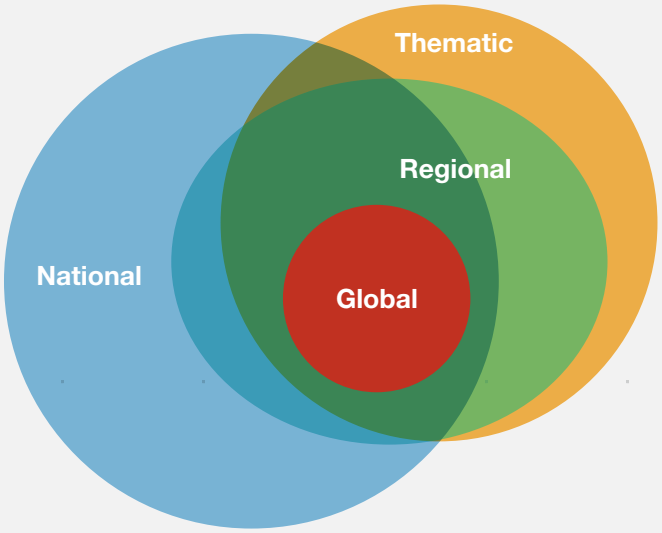
to the needs of national government in preparing education plans and informing policies. Data that provide greater granularity offer a greater opportunity to inform policy decisions by examining differences among sub-regions, nationally-specific disadvantaged groups and other important areas for national and local policies. Thus, national indicator frameworks can better recognise local contexts and differences within countries (Pritchett and Sandefur, 2015). Ideally, this level would involve consultations on priorities and information needs among a wide range of national stakeholders. Countries can consider using thematic, regional or other indicators to reflect their unique circumstances and development priorities.

At the regional level of monitoring, a set of indicators may be developed to take account of priorities and issues of common interest that are shared by countries in a particular region. For example, the African Union is aligning the targets and indicators for its regional AU2063 framework with the SDG frameworks but will likely include other indicators that are region-specific (African Union, 2015).

For thematic, or sectoral monitoring, a set of globally-comparable indicators has been proposed following consultations within the different sectoral stakeholder groups (e.g. education, environment, energy, health). The thematic indicators serve as a framework to track progress on a cross-nationally comparable basis with a wider view of a range of sectoral priorities than the global framework which captures a more limited perspective through a small set of leading indicators.

The monitoring of SDGs at the global level relies on a more limited and carefully chosen set of indicators

Figure 3. Four levels of monitoring the education targets




*Source: UNSG, 2014*

to provide an overall view on progress towards the targets. The ability to analyse and compare national data across countries and years provides insights for measuring performance, driving policy reform and allocating resources equitably to improve learning among all population groups.

At all levels of monitoring, there are different types of data users relying on this information in order to make better decisions, although their needs may differ. For example, government planners and policy-makers need relevant, reliable and timely data that can be used to help manage the provision of services more efficiently and more cost-effectively while meeting the needs of all. For civil society, open data which are publicly available can help stakeholders to advocate for policies and to hold their governments accountable. System level data help donor agencies to verify that development objectives are being met and that resources have been efficiently and effectively utilised.

### *A focus on education quality and equity*

The SDG 4-Education 2030 Agenda presents national and international education stakeholders with two critical measurement challenges: learning outcomes and educational equality, broadly conceptualised. In both cases, the challenges are to be addressed through a universal agenda with indicators that are relevant for all countries. The targets look at learning throughout the life-cycle, from early childhood to adulthood. They also go beyond traditional areas of measurement, such as reading and mathematics to reflect a comprehensive and integrated view of the skills needed in relation to society and the environment.

Equity is emphasised as there are means of focusing on quality without addressing the many aspects related to those on the margins and those who have been left behind. By transforming "the way learning is understood in contexts…we can begin to understand how to better promote policies that will

**Box 1. Leading efforts to ensure that learning becomes a central part of the global SDG agenda**

Alongside the country-led UN process deliberating on goals and targets, the UIS and the Center for Universal Education (CUE) at the Brookings Institution convened a broad group of national and international education stakeholders as part of the Learning Metrics Task Force (LMTF) to promote the use of assessments and their resulting data to improve the learning outcomes of all children and youth and to help catalyse a shift in the global education conversation from "access" to "access plus learning" in light of the new development goals.

Building consensus on global learning indicators and actions will improve the measurement of learning in all countries. With input from more than 1,700 individuals in 118 countries, the task force developed a series of recommendations on what to assess and how to measure learning to improve the opportunities and outcomes of all children. These are published in the report, *Toward Universal Learning: Recommendations from the Learning Metrics Task Force*, which outlines how the measurement of learning outcomes can help to ensure quality education for all.

With the release of their recommendations in September 2013, the LMTF built strong consensus on the need for specific SDG targets that focus on learning in addition to access to education. Since the dissolution of the LMTF in February 2016, the political consensus has been reinforced by new initiatives (see Box 13 on the Global Alliance for Monitoring Learning) supporting the technical implementation of the SDG targets on learning and education quality at national and international level.

*Source: LMTF, 2014*

enhance educational quality and increase the learning consequences among those hardest to reach" (Wagner and Castillo, 2014).

These issues provide the lens through which countries will look to assess global progress towards achieving their objectives. Even before the adoption of the policy targets in September 2015, efforts to reach global consensus among Member States on a robust set of indicators that could be used to monitor progress towards the goals at the national and international levels were well underway *(see **Box 1**)*.

### *Advancing the monitoring frameworks: Risks and actions needed*

A number of actions by both national and international stakeholders are needed to address the risks associated with implementing the indicator frameworks to monitor SDG 4. These include the need to: ensure data quality standards and develop new measurement methodologies; coordinate the new players at the national and international levels; and mobilise sufficient resources.

### *A need for data quality standards and developing new measurement methodologies*

Statistical standards are central to education statistical systems and directly affect the quality of the data over time and across countries. Statistical standards consist of definitions, concepts, classification systems and methodologies. They are developed to ensure harmonisation and improve comparability of official statistics, whether within a country or across countries. Overall, these standards can serve as guidelines that enable countries to standardise how data are collected and statistics are produced and disseminated. New data sources will be required and existing ones will need to be assessed, extended, improved and integrated with other data sources.

On the international level, new data collections and processing may be required to make categories comparable—to create metrics which are comparable across countries. There is a lack of consistency involving standards and definitions even between the international organizations involved in the production of education statistics.

### *A need for coordination*

The challenges associated with the new SDG agenda are markedly greater compared to those of the MDGs. There are many more indicators, many more actors—both nationally and internationally—and a much wider range of data sources to be used. In order to ensure that efforts are not duplicated but well-targeted and focused, good coordination is needed between organizations and within countries.

At the international level, the UIS is established as the overall coordinator for SDG 4 indicators and thus interacts with a range of other partners who collect/contribute data towards a specific target or indicator *(see **Box 2**)*. The UIS also contributes to other goals in its field of responsibility. The Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs, *see **Box 3***) is considering nominating custodial agencies for each of the global indicators but there is also a need for coordination at the goal level and across major cross-cutting themes.

At the national level, there must also be good coordination between ministries and national statistical offices. In particular, line ministries (such as education, health and agriculture) that may have responsibilities for data collection will need to work closely with national statistical offices to ensure coherence in data collection and reporting across the whole SDG agenda.

### *Resource mobilisation*

In order to meet the challenges of the measurement agenda, greater resources will be needed to support national statistical systems. Typically statistics and monitoring and evaluation efforts receive insufficient funding to carry out even basic tasks.

Global efforts to help support national monitoring of the SDGs is significant and provides a framework for development assistance. A lack of funding is a persistent problem in developing countries. In 2013, only 0.24% of total official development assistance (ODA) was dedicated to statistics (PARIS21, 2015). Donor funding accounts for the majority of total budgets for improving statistics in several sub-Saharan African countries, and in many countries core data collections could not be created without external funding (Glassman and Ezeh, 2014). Countries' dependence on external finance can lead to donor-driven agendas which do not meet national monitoring needs. Support for countries by development partners can be disruptive, with too little technology, knowledge transfer or capacity-building, often resulting from donors' project cycles, combined with little genuine domestic demand for the kind of activities that have been carried out (Levine, 2013).

In considering where to invest most effectively in the measurement agenda—which data needs should have the greatest priority—the value of information matters. It is important to prioritise efforts to address existing data gaps—considering first those gaps which are relatively low in cost but high in information value. This could also mean looking for opportunities to better exploit existing data (the myriads of national surveys or the administrative data which are collected but not compiled or used) while considering the introduction of new data collection tools. Even what may seem to some as a considerable investment, for example launching a national learning assessment, may represent only a tiny share of the overall

### Box 2. The role of the UIS

The UIS, as the UN statistical agency for education, science and culture is part of a wider UN system, which supports systems in Member States and coordinates statistical activities at the global, regional and national level.

The UIS and other UN statistical agencies, through various bodies, set measurement norms and recommendations which are formally adopted by countries. For example, the World Health Organization's (WHO) concept of *live birth* or the International Labour Organization's (ILO) definition of *child labour*, reached by consensus among countries, are considered to be the gold standard and are integrated into national measurement systems. Likewise in the areas of its mandate, countries look to UNESCO as the authoritative source for good practices in the area of statistics.

While national statisticians adhere to national statistical legal frameworks, they typically also follow UN principles and recommendations, for example in designing their national population census, household survey or education school census. These principles and recommendations are generated through a technical process and validated by Member States at the political level.

UN statistics, like those produced by the UIS, are based on data produced by national information systems and directly provided by Member States, and in cases where they are not provided, indicators may be published after validation by countries. In the context of the SDGs, where decisions and lines of action are much more country-driven than in the past, the UIS has implemented an approach which is participatory, transparent and open to countries starting at the stage of defining indicators.

*Source: UNESCO Institute for Statistics*

education budget but could provide information which better leverages results.

Moreover, high-quality statistics are essential for effective education planning and the cost of unreliable or missing data can lead to poorly-informed decisions, misguided policies and a waste of already scarce resources. Without reliable data, the cost of being in a position not to be able to assess whether policies are successful or not and whether the situation is improving can be very high.

## 1.2 DEFINING THE GLOBAL INDICATORS

In December 2014, the UN General Assembly requested that the United Nations Statistical Commission (UNSC) propose indicators for sustainable development goals and targets. The UNSC is part of the global architecture of the UN dedicated to data and statistics *(see **Box 4**).* At its 46th session in March 2015, the UNSC endorsed the formation of the IAEG-SDGs to develop an indicator framework for the global monitoring of the SDGs for review and approval by the UNSC at its 47th session in 2016.

The IAEG-SDGs, consisting of 27 regionally-representative experts from national statistical offices, was duly formed (*see Box 3*). Between June 2015 and February 2016, the IAEG members received advice from many sources, including UN Member States, international and regional organizations, academia, businesses, NGOs and civil society, and developed a global indicator framework to monitor the 17 goals and 169 targets of the 2030 Agenda for Sustainable Development. Their proposal included 11 global indicators to monitor the targets of SDG 4. The IAEG's proposal was based on several rounds of global consultations and discussions in a number of face-to-face meetings, including two meetings of the extended IAEG in June and October 2015 respectively. The final framework was discussed and endorsed by the UNSC in March 2016 and is ready for adoption by the UN Economic and Social Council (ECOSOC) and the UN General Assembly (*see **Figure 4***).

## Box 3. Members of the Inter-Agency and Expert Group on the SDGs (IAEG-SDGs)

The following United Nations Member States are currently members of the (IAEG-SDGs):

**Eastern Africa**
Tanzania
Uganda

**Middle and Southern Africa**
Botswana
Cameroon

**Western Africa**
Cabo Verde

**Northern Africa**
Algeria
Senegal

**Western Asia**
Armenia
Bahrain
Egypt

**Central, Eastern, Southern, and South-East Asia**
China
India
Kyrgyzstan
The Philippines

**Oceania**
Fiji
Samoa

**The Caribbean**
Cuba
Jamaica

**Central and South America**
Brazil*
Colombia
Mexico

**Eastern Europe**
Russian Federation

**North America and Northern, Southern and Western Europe**
Canada
France
The Netherlands
Sweden
Germany

**Note:** * The Chair of the United Nations Statistical Commission is a member of the IAEG-SDGs ex-officio.

*Source: UNSD, 2016.*

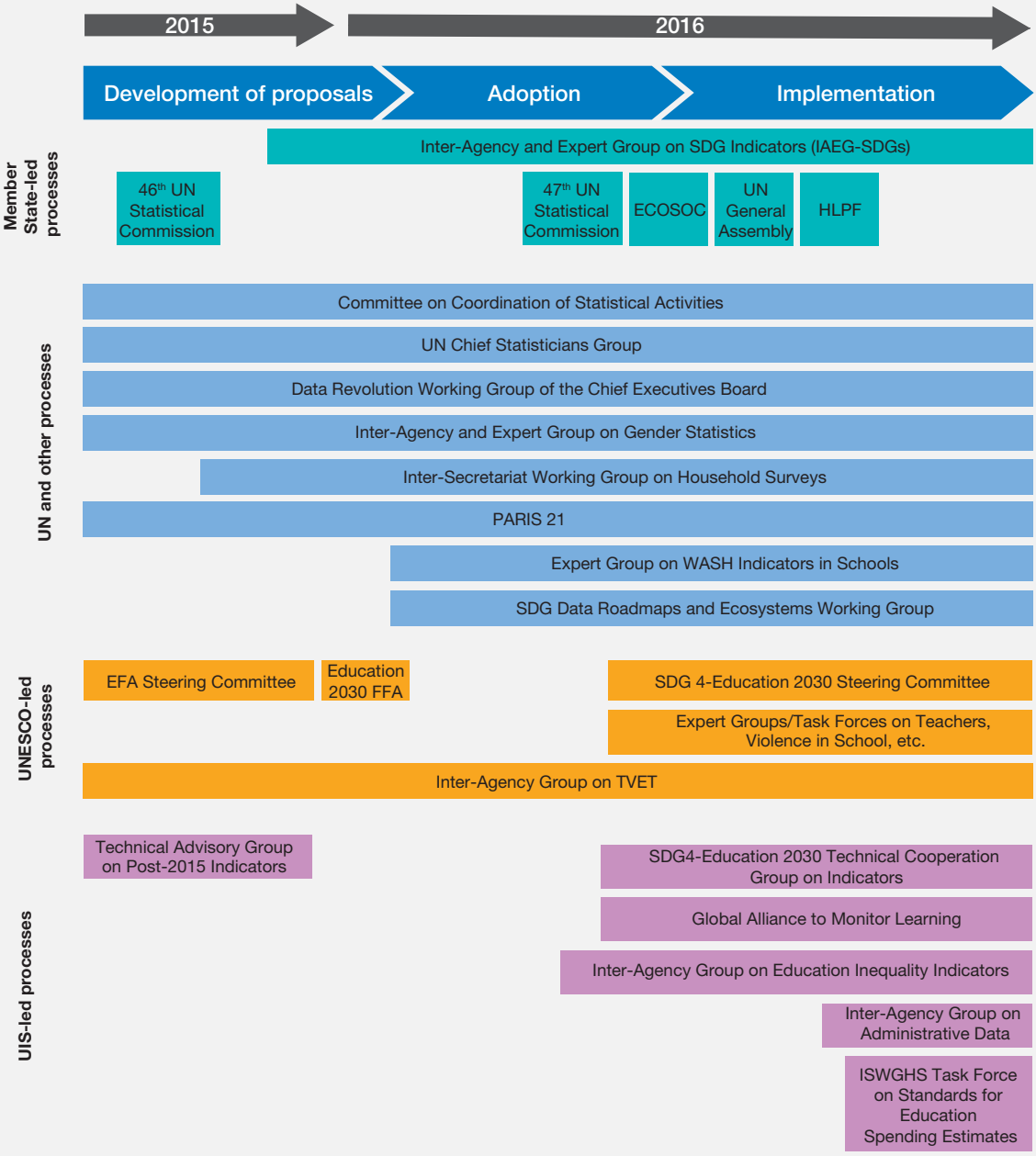
## Box 4. "Delivering as one UN" to support national statisticians in monitoring the SDGs

The UIS is a member of the UN Statistical System Coordination Group which promotes system-wide integrated and coherent actions to enhance and modernise sustainable statistical data collection across all UN agencies. It contributes to the adoption and implementation of international statistical standards in line with the Fundamental Principles of Official Statistics adopted by the UN General Assembly. It meets regularly in order to promote information exchanges and coordinate activities for "delivering as one" to avoid duplication and overlap. It works alongside other coordination bodies, like the Committee for the Coordination of Statistical Activities (CCSA) and the UN Statistical Commission. Its members include chief statisticians or directors or chiefs of statistics departments or units within the UN system, including UIS, specialised agencies, programmes and funds, and regional economic and social commissions.

In the context of the SDGs, the UN Statistics Division (UNSD) has gathered data from the UN and other organizations for each of the indicators. These have been published in an SDG Indicator Database hosted by the UNSD. The UIS compiled data for each of the global indicators under its fields of responsibility (education, science and culture). At the same time as the database was launched, the first annual SDG Progress Report was published. The report is a brief summary of each goal based on the global indicators. The UIS coordinated the contributions for SDG 4 and contributed to the storylines for other goals of interest to UNESCO.

*Source: UN, 2015*

Figure 4. Developing global and thematic statistical frameworks—a timeline




*Source: UNESCO Institute for Statistsics, 2016*

As with the development of the 2030 Agenda for Sustainable Development, the IAEG's work has been led by countries which have approved the various indicator proposals both in the IAEG and the UNSC and have led the adoption process. It has formed a working group on data disaggregation (for countries only) and three working groups on: (i) geo-spatial information, (ii) inter-linkages between indicators and integrated analyses for monitoring and (iii) technical platforms for sharing data, such as the Statistical Data and Metadata eXchange (SDMX).

## 1.3 DEFINING THE THEMATIC INDICATORS

To more comprehensively reflect the needs of national and international education stakeholders, a broader set of thematic indicators for education was proposed alongside the global indicators in a parallel but strongly linked process. The thematic indicator framework was first developed by a Technical Advisory Group (TAG) established by UNESCO in March 2014 to draft recommendations for indicators to track global progress towards the implementation of the education agenda post-2015. This is now called the Education 2030 Agenda.

The TAG was chaired by the UIS and included experts from the Organisation for Economic Co-operation and Development (OECD), UNESCO, the UN Children's Fund (UNICEF), the World Bank and the *Global Education Monitoring Report* (GEMR). The group developed and refined an initial proposal that became the subject of a global consultation from mid-November 2014 to the end of January 2015. Contributions generated by hundreds of participants helped to further improve the relevance and extend the coverage of the indicator proposal.

A revised proposal was presented in May 2015 during the World Education Forum (Incheon, Republic of Korea) which was attended by education ministers and senior officials from more than 160 countries. The Forum recommended that the TAG's indicator proposals should be reviewed by a regionally-representative set of experts from UNESCO Member States.

The UIS led a process which included two meetings of the extended TAG and one round of consultations within each region in mid-2015. The extended TAG included representatives of 12 UNESCO Member States, civil society groups and the organizations from the original TAG. Following extensive reviews, the extended TAG proposed a list of 43 thematic indicators (including the 11 indicators generated as part of the global process) for monitoring education progress between 2015 and 2030. This list was included in the Education 2030 Framework for Action that was adopted by 184 UNESCO Member States on 4 November 2015.

The Framework for Action was the result of a collective effort involving consultations facilitated by UNESCO as well as other partners which included inputs provided by Member States, UN agencies, multilateral agencies, civil society organizations and private entities.

The Education 2030 Framework for Action, which was endorsed by countries, UN agencies, civil society organizations and other stakeholders, mandated the UIS to work with partners to lead in data collection, indicator development and in strengthening national data systems *(see **Box 5**).* To carry out this mandate, in 2016 the UIS convened the Technical Cooperation Group (TCG) on the Indicators for SDG 4-Education 2030 to lead the development and implementation of the thematic indicator framework, which is designed to monitor more comprehensively the global education targets. The TCG is composed of regionally-representative experts from 28 Member States (the same regional representation as the IAEG-SDGs), UNESCO, multilateral partner agencies and civil society organizations. The TCG is chaired jointly by the UIS and the UNESCO Education Division, with the Institute hosting the Secretariat.

**Box 5. The roles of the UIS and the GEMR in monitoring education within the global development agenda**

The Education 2030 Framework for Action sets out the respective roles of the UIS and the GEMR. For the indicators, "…the UIS will remain the official source of cross-nationally comparable data on education. It will continue to produce international monitoring indicators based on its annual education survey and on other data sources that guarantee international comparability for more than 200 countries and territories. In addition to collecting data, the UIS will work with partners to develop new indicators, statistical approaches and monitoring tools to better assess progress across the targets…". At the same time, it is recognised that close cooperation among partners will be necessary to strengthen the relevant measurement and monitoring capacities of Member States, and the UIS will play an active role to "facilitate sharing of best practices with a view to strengthening country data systems to monitor the key themes of Education 2030, such as equity, inclusion, quality and learning".

The GEMR will continue to monitor progress, drawing on the data and information produced by the UIS as well as other sources. It "will be the mechanism for monitoring and reporting on SDG 4 and on education in the other SDGs, with due regard to the global mechanism to be established to monitor and review the implementation of the 2030 Agenda for Sustainable Development. It will also report on the implementation of national and Education 2030 international strategies to help hold all relevant partners to account for their commitments…."

*Source: E2030 FFA, 2016*

## 1.4 INTRODUCING THE INDICATOR FRAMEWORKS

Both the global and thematic education indicators were designed to facilitate cross-national monitoring of progress towards the targets. Countries will be encouraged to report on both sets of indicators—global and thematic. Each country will determine whether it is able to collect all of the data needed for each of the recommended indicators and to report them as requested. Countries may choose from the list of thematic indicators which are most relevant for their policy needs. International organizations will continue to collect the available country data for cross-national comparisons and to report on their trends and levels.

Indicators selected for global tracking need to meet a range of standards to ensure technical strength, feasibility, frequency of reporting, cross-national comparability and interpretability, and availability of data over time *(see **Box 6**).*

### *The global SDG 4 indicators*

The global indicator framework will be used for the high-level review and follow-up of the entire 2030 Agenda for Sustainable Development and will address the inter-linkages between different goals (*see **Box 7***).

### *Learning and equity*

Five of the ten education targets focus on the learning outcomes of young children, youth and adults. This is a shift from previous global education targets, such as those in the MDGs, which focused solely on ensuring access, participation and completion in formal primary education and on gender equality in primary, secondary and tertiary education. The Education 2030 targets underscore the extent to which enrolment and participation are the best means to attain good results and learning outcomes at every age and stage, such as school readiness for young children; academic competencies for children in primary and secondary education; functional literacy and numeracy skills; and skills for work, global

## Box 6. Criteria for selecting indicators

**Relevance:** While it is difficult for indicators alone to fully capture the vision behind the proposed targets, indicators should ideally reflect the most critical policy themes in the targets. Across all targets, emphasis has been placed on measuring learning outcomes and equity.

**Alignment**: The construct to be measured must be valid and reliable relative to the targets. This means that the indicator must have the same meaning and significance in all settings, ideally measured by a similar question or item. Measuring constructs that vary across settings poses challenges for global tracking. It may be possible to measure some elements globally, while others may be best measured at the national or regional level, with flexibility to adapt constructs to local contexts.

**Feasibility**: Global tracking is most effective when the data are collected on a regular basis (though not necessarily annually), and all or nearly all countries routinely collect data in a similar manner. Infrequent or low coverage of data constrains the ability to track changes over time. Collecting data over time must also be feasible and cost-effective.

**Communicability:** The indicators selected must be easily understood and lend themselves to the development of a clear narrative regarding progress towards the goal and its targets. The indicator framework for education should facilitate clear and transparent reporting and effective communication about the objectives and achievements at each stage of implementation.

**Interpretability**: The indicator values and their changes over time must be easily understood.

*Source: UNESCO Institute for Statistics*

citizenship and sustainable development for youth and adults. The framework proposes indicators that enable the measurement and comparison of learning outcomes at all levels of education.

The SDG agenda, beyond Goal 4, calls for an explicit focus on equity, including equity-specific goals (Goal 5 on gender equity and Goal 10 on reducing inequalities). In response, education indicators should aim to capture not just national averages but also the variation across different sections of the population defined by group and individual characteristics, such as sex, wealth, location, ethnicity, language or disability (and combinations of these characteristics).

Global monitoring of inequalities in education and other sectors has so far mainly captured differences by sex. This reflects the MDGs' focus on gender inequalities which, in turn, reflected what data were available for most countries. Today, however, gaining a better understanding of disadvantage in education will require countries to collect disaggregated data on individuals from a variety of sources, including administrative records and household or school-based surveys.

**Table 1** presents the education targets adopted by the UN General Assembly (UNGA) in September 2015 and the global indicators proposed by the IAEG-SDGs, endorsed by the UNSC and ready for adoption by the UN ECOSOC and the UN General Assembly.

In addition to the ten education targets (SDG 4), there are education-related indicators which will be used to monitor progress towards other SDGs (*see **Table 2***). These indicators would be measured and monitored alongside the SDG 4 global indicators. The Secretary-General's report emphasised that the integrated and indivisible nature of the goals should lead to a review system that promotes a cross-cutting

## Box 7. Quality national statistics needed to produce globally-comparable data

Countries have led the development of the global indicator framework to review progress towards the Sustainable Development Goals. While comparability is a vital aspect of these indicators, countries may also opt to develop and track other indicators that are relevant to their specific policy needs and contexts. This leads to a discussion about the purpose of globally comparable data, whether they conflict with national statistics, and how these concepts are related.

In producing official statistics, countries respect various frameworks in establishing a functioning national statistical systems: following national laws, recommendations of regulatory bodies, recommendations of regional bodies, and following a set of principles, norms and standards (usually referred to as *good practices*) of the supranational organizations with recognised expertise in relevant technical areas, such as different specialised United Nations agencies.

This set of norms, standards and recommendations constitute the guide for countries to produce good quality data. It starts with the *Fundamental Principles of National Official Statistics* (http://unstats.un.org/unsd/dnss/gp/fundprinciples.aspx), which represents the first steps towards comparability. The concept of *good practices* is well developed and countries look to UNESCO as the main authority for good practices in the area of education statistics.

What a country needs to do for national and global reporting:

**For national statistical systems**
- Establish national standards and protocols
- Integrate regional recommendations
- Adopt international codes of practice and classifications

**For global reporting on the SDGs**
- Align relevant constructs/data collections
- Fulfil minimum quality on data process
- Harmonise for global reporting metrics

In order to achieve global comparability, it is necessary to define a cross-nationally relevant conceptual framework, to establish minimum quality standards and to adopt common reporting metrics by areas and types of indicators. Such standards are adopted systematically in order to produce indicators in a range of different areas, from measuring poverty, health status, to assessing learning student learning achievement.

The process of producing globally comparable official statistics requires international leadership and coordination, but also ownership by countries: the data have to be produced by national information systems, directly provided by countries to the competent international agency and indicators should be validated by countries before being published. In the context of the SDGs and consistent with a global agenda which is more country-driven than in the past, the UIS is working on strengthening the processes to produce the new indicators for SDG 4 by increasing the engagement of countries in transparent and open discussions.

*Source: UNESCO Institute for Statistics*

understanding of the significant inter-linkages across the goals and targets. These inter-linkages are crucial. The national customisation of the SDGs is expected to identify synergies and prioritise these cross-cutting issues across goals and targets. Indicators that can measure progress in more than one target will need to be developed. Policies and strategies should pass the test of having positive impacts on at least two dimensions of sustainable development—a "second best" solution when the "first best" is not available. High level cooperation and coordination among various government departments and agencies dealing with economic, social and environmental challenges are critical for ensuring an integrated approach to implementation and reviews. Finally, the support from the UN system and other international organizations must also be coordinated to exploit existing synergies and cross-cutting issues.

## Table 1. Global education targets and indicators for the 2030 Agenda for Sustainable Development

### Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

| Targets | Indicators |
|---|---|
| **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 | **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 |
| **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 | **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<br>**4.2.2** Participation rate in organized learning (one year before the official primary entry age), by sex |
| **4.3** By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university | **4.3.1** Participation rate of youth and adults in formal and non-formal education and training in the previous 12 months, by sex |
| **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 | **4.4.1** Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill |
| **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 | **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 |
| **4.6** By 2030, ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy | **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 |
| **4.7** By 2030, ensure that all learners acquire the 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 | **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 |
| **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 | **4.a.1** Proportion of schools with access to: (a) electricity; (b) the Internet for pedagogical purposes; (c) computers for pedagogical purposes; (d) adapted infrastructure and materials for students with disabilities; (e) basic drinking water; (f) single-sex basic sanitation facilities; and (g) basic handwashing facilities (as per the WASH indicator definitions) |
| **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 and information and communications technology, technical, engineering and scientific programmes, in developed countries and other developing countries | **4.b.1** Volume of official development assistance flows for scholarships by sector and type of study |
| **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 | **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 |

*Source: UN, 2015*

**Table 2. Education-related targets and indicators in other SDGs**

| Goals | | Targets | Global indicator |
|---|---|---|---|
|  | **SDG 1: End poverty in all its forms everywhere** | **Target 1.a** Ensure significant mobilisation of resources from a variety of sources, including through enhanced development cooperation, in order to provide adequate and predictable means for developing countries, in particular least-developed countries, to implement programmes and policies to end poverty in all its dimensions | Proportion of total government spending on essential services (education, health and social protection) |
|  | **SDG 3: Health and well-being** | **Target 3.7** By 2030, ensure universal access to sexual and reproductive health care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes | Proportion of women of reproductive age (aged 15-49 years) who have their need for family planning satisfied with modern methods<br><br>Adolescent birth rate (aged 10-14 years; aged 15-19 years) per 1,000 women in that age group |
|  | **SDG 5: Gender equality** | **Target 5.6** Ensure universal access to sexual and reproductive health and reproductive rights as agreed in accordance with the Programme of Action of the ICPD and the Beijing Platform for Action and the outcome documents of their review conferences | Number of countries with laws and regulations that guarantee women aged 15-49 years access to sexual and reproductive health care, information and education |
|  | **SDG 8: Decent work and economic growth** | **Target 8.6** By 2020 substantially reduce the proportion of youth not in employment, education or training | Proportion of youth (aged 15-24 years) not in education, employment or training |
|  | **SDG 12: Responsible consumption and production** | **Target 12.8** By 2030 ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature | Extent to which (i) global citizenship education and (ii) education for sustainable development (including climate change education) are mainstreamed in (a) national education policies (b) curricula (c) teacher education and (d) student assessment |
|  | **SDG 13: Climate change** | **Target 13.3** Improve education, awareness raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning | Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula |
|  | **SDG 16: Peace, justice and strong institutions** | **Target 16.6** Develop effective, accountable and transparent institutions at all levels | Primary government expenditures as a proportion of original approved budget by sector (or by budget codes or similar) |

*Source: UN, 2015*

### *The thematic indicators*

The 43 thematic indicators include the 11 global indicators for SDG 4 (*see the* ***Annex***). Together, the indicators provide greater alignment between the education targets and national priorities and contexts, while maintaining cross-national comparability. They also allow for more in-depth review of each target and the intermediate steps needed to achieve the target as a whole. The global indicators address the key outcome at stake with each target.

The set of thematic indicators will also act as reference indicators that can be used for monitoring progress at regional, national and sub-national levels. Countries will judge for themselves to what extent these indicators meet their needs and reflect their specific situations. It is expected that countries will want to develop indicators for their own use that take better account of their education systems' stage of development—especially at national and sub-national levels. For example, some countries still face the challenge of achieving universal primary education, while others may be focused on expanding secondary and post-secondary opportunities, or on acquiring skills, knowledge and competencies, or on improving education quality and reducing inequities. Each of these priorities will require different types of data and indicators for effective monitoring. When not already available in the global and thematic sets, new indicators will have to be developed.

In determining the 43 thematic indicators, each target was analysed with two purposes in mind: to identify the key concepts that needed to be measured in order to monitor progress towards achieving it; and whether existing policies would be sufficient to ensure the target could be met or whether further action, including remedial action, might be needed to get back 'on track'. **Table 3** lists the key concepts by target for which indicators have been proposed.

Compared to the global framework, the thematic monitoring framework includes a wider view on a range of sectoral priorities by including a larger number of indicators to provide greater alignment between the targets and national priorities and contexts while maintaining international comparability (*see* ***Table 4***).

For example, the global indicator for Target 4.c focuses on the proportion of teachers receiving training in pedagogy/pedagogical approaches. This indicator is meant to be a proxy for overall teacher quality which underpins the performance of the education system as reflected in student learning. The thematic indicators allow for deeper tracking of different factors that are amenable to policy change and more broadly cover the concept of teacher quality by including six additional indicators related to academic qualifications, teacher motivation, and support for teachers. This richer set of data can be used to consider broader trends in teaching and learning.

The thematic framework also allows a more comprehensive and nuanced view related to potential levers for policy change (*see Table 4)* by including different policy-based indicators (often in areas where direct measures of implementation are difficult and/or not well developed). These indicators include: the number of years of free and compulsory education from pre-primary to secondary education guaranteed by governments; the mainstreaming of global citizenship education, HIV and sexuality education and human rights education in national curricula; and public policies aimed at promoting equity in educational opportunities.

**Table 3. Education targets, global and thematic indicators and key concepts**

| Target | No. of indicators | Concepts |
|---|---|---|
| 4.1 Quality in primary and secondary education | 2 | Learning |
| | 2 | Completion |
| | 2 | Participation |
| | 1 | Provision |
| 4.2 Access to quality early childhood development, care and pre-primary education | 2 | Readiness to learn |
| | 2 | 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 | 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 | Skills |
| | 1 | Participation |
| 4.7 Knowledge and skills needed to promote sustainable development | 3 | Provision |
| | 2 | Knowledge |
| 4.a Education facilities that provide safe, non-violent, inclusive and effective learning environments for all | 3 | Resources |
| | 2 | Environment |
| 4.b Expand globally the number of scholarships available to developing countries | 2 | Scholarships |
| 4.c Increased supply of qualified teachers | 2 | Qualified teachers |
| | 2 | Trained teachers |
| | 2 | Motivation |
| | 1 | Support |
| **Total** | **43** | |

*Source: E2030 FFA, 2016*

**Table 4. Thematic indicators with an expanded view of the education sector**

| Concept | Global indicators | Thematic indicators |
|---|---|---|
| **Participation and completion** | ▪ Participation in ECCE<br>▪ Participation of youths and adults | ▪ Completion of primary and secondary education<br>▪ Participation in primary and secondary education |
| **Policy and provision** | ▪ Policies and provision of global citizenship and education for sustainable development | ▪ Years of free and compulsory education from pre-primary to secondary education<br>▪ Public policies promoting equity<br>▪ Provision of GCED, HIV and sexuality education and human rights education |
| **Knowledge, skills, learning and readiness** | ▪ Learning outcomes at primary and secondary education<br>▪ Readiness: school readiness of children under 5<br>▪ Skills: ICT skills, literacy skills | ▪ Readiness: stimulating home learning environment<br>▪ Skills: digital literacy<br>▪ Knowledge: environmental science and geoscience |
| **School infrastructure and environment** | ▪ School resources | ▪ School environment |
| **Scholarships** | ▪ Volume of ODA flows | ▪ Numbers of scholarships |
| **Teachers** | ▪ Training | ▪ Qualifications<br>▪ Motivation<br>▪ Support |

*Source: UNESCO Institute for Statistics*

# 2. Monitoring the new education targets: Are countries ready?

Are countries ready to monitor progress towards the new education agenda? The landscape of education data has changed markedly in the last decade with the extension of administrative data collections, the growing number of national and cross-national student learning assessments and the hundreds of new comparable education measures based on harmonised household surveys. This section describes the current baseline *(see **Box 8**)* to monitor the ambitious policy agenda for education quality and equity and to further identify where significant data gaps remain.

## 2.1 READINESS TO REPORT GLOBAL AND THEMATIC INDICATORS

The UIS conducted regional assessments among country experts responsible for collecting and reporting national education statistics across the world (*see Box 8*). Country experts evaluated current national capacity to produce data for the indicators proposed for global and thematic indicator frameworks.

Based on data from the UIS regional assessments, **Figure 5** compares the proportion of data available to monitor the global framework (11 indicators) and the

### Box 8. Assessing country readiness to monitor SDG 4

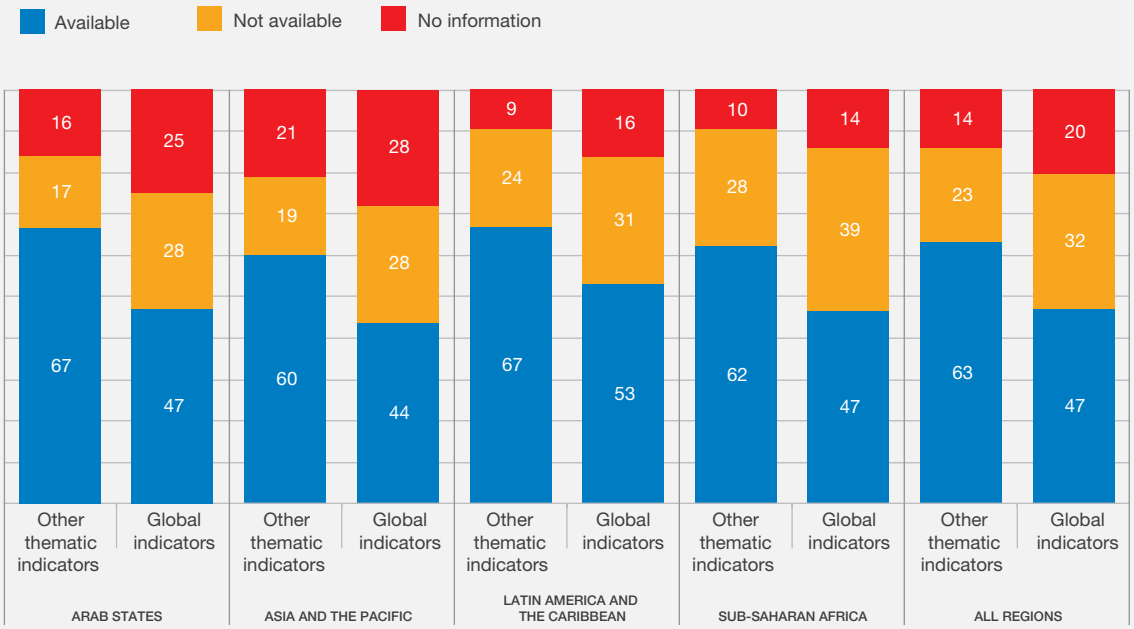
To better assess countries' readiness to monitor SDG 4, the UIS collected data from countries in four regions: the Arab States, Asia and the Pacific, Latin America and the Caribbean, and sub-Saharan Africa. A total of 121 countries responded, representing almost 80% of the total number of countries. The response rates by region were: Arab States (18/19 countries), Asia and the Pacific (38/47 countries), Latin America and the Caribbean (26/42 countries) and sub-Saharan Africa (40/47 countries). Data collection took place between January and April 2016.

The appraisal was conducted among government staff responsible for education statistics, typically in policy and planning units at the ministries of education and in some cases national statistical offices, which are also responsible for reporting statistics to the UIS. Respondents were asked to report whether or not their country produces the data required for each of the global and thematic indicators. Based on the availability of data, additional information, such as for the latest available year, periodicity of data collection and disaggregation of the latest available data by individual characteristics was collected.

There are some limitations in interpreting the results: in some cases, no information was provided by national experts due to a lack of knowledge regarding data not traditionally produced by their respective agency. In other cases, the indicators in the framework were still not well defined, and thus, it was difficult for national respondents to identify the national data required to monitor them. An in-depth assessment requiring consultations involving all potential data production entities will be needed to develop a more nuanced strategy to strengthen national education statistics for monitoring progress towards SDG 4.

*Source: UNESCO Institute for Statistics*

**Figure 5. SDG 4 - Education 2030 data availability by region and level of monitoring (%)**




**Note**: For the purpose of this comparison, the thematic indicators exclude the 11 global indicators. The proportion of data available for all 43 indicators was 57% globally, 59% in the Arab States, 54% in Asia and the Pacific, 62% in Latin America and the Caribbean, and 56% in sub-Saharan Africa.

*Source: UIS regional assessments of system readiness to monitor SDG 4, 2016*

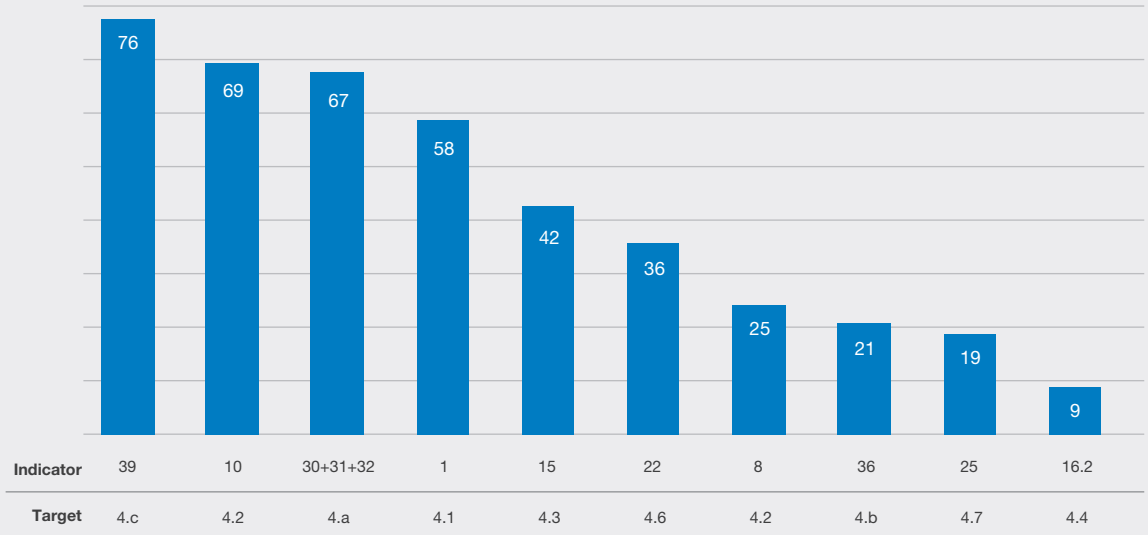
thematic framework (minus the 11 global indicators). It is apparent that data are available for slightly less than one-half of the global indicators across the four regions, with the highest proportion found in Latin America and the Caribbean (53%) and the lowest in Asia and the Pacific (44%).

On the other hand, monitoring the thematic framework may not be as difficult as expected. Countries reported already having a substantially higher proportion of the thematic data compared to the global data needed. By region, data currently available for thematic indicators range from 60% in Asia and the Pacific to 67% in the Arab States and Latin America and the Caribbean. This difference by region (of up to 16 percentage points) between the availability of global and thematic indicators reflects not only the inability of existing data sources to respond to the new demands for indicators, such as the direct assessment of specific skills, but also that countries have focused more on data corresponding to the thematic framework.

### *Data availability by target*

When analysing data availability for global indicators by target *(see **Figure 6**)*, the biggest gaps concern direct assessment of ICT skills or digital literacy (4.4). However, there are also gaps in data on global citizenship and education for sustainable development (4.7), scholarships (4.b) and development outcomes of young children (4.2). Reaching consensus on comparable approaches to capturing these concepts (and those in the thematic framework) could lead to the introduction of new data collections in the short term that would serve to improve data availability overall. The global indicators with the highest reported data availability relate to teacher training (4.c),

Figure 6. Data availability for each global indicator for all regions (%)




*Source: UIS regional assessments of system readiness to monitor SDG 4, 2016*

participation rates for pre-primary education (4.2) and school environments (4.a). These data are more likely to be available because they are already commonly generated through existing administrative data systems. In addition, more than one-half of the countries (58%) reported having the required data to measure the proficiency level that students achieve in reading and mathematics at different stages of the education system (4.1).

To better interpret these results, it is important to understand the context. A national education statistical system (NESS) is part of the broader national statistical system, which is mandated to produce official statistics for policy and planning. The NESS is at the centre of collecting, processing, disseminating and using data on education and thus, follows national and international sets of definitions, methodologies, classifications and tools. To monitor SDG 4, a NESS must effectively integrate different data sources, including administrative datasets (under education management and information systems—EMIS), household surveys, learning assessments and finance and expenditure datasets *(see **Box 9**)*. However, many countries lack well-established systems that integrate these different data sources.

The assessment also revealed some uncertainty among national respondents about the availability of data required to produce certain SDG indicators. Some respondents answered that they did not know whether or not certain data are produced in their countries. For instance, 23% of the respondents did not know if the data required for global indicator 4.2.1 on early childhood development were collected—as they may be part of independent research or community-led initiatives that do not have a link to official statistical institutions. The 'no information' category applied to 20% of data for global indicators and 14% for other thematic indicators. The highest rates were found in Asia and the Pacific and the Arab States.

## Box 9. Main sources of national education data

**Administrative data** are based on information usually collected annually to help manage the education system. They are a common data source for many thematic indicators. Most countries around the world have fairly developed systems in place, where common education statistics, such as enrolment, number of graduates and teachers, are collected, stored and disseminated. Although these systems normally collect data by basic individual characteristics such as sex, age and location, they are more limited in terms of other types of disaggregation. Some countries still face data quality issues in collecting accurate information on teachers and students.

**Household surveys** are an important source of data on the demand for education, including access, participation and educational attainment. National surveys differ in terms of coverage, frequency, purpose and questionnaire design. In contrast to administrative data, they are collected less frequently and by a variety of organizations and countries. International surveys, like the Demographic and Health Survey (DHS, funded by USAID) and the Multiple Indicator Cluster Surveys (MICS, funded by UNICEF), are typically carried out in participating countries every three to five years. Population censuses are usually conducted by national statistical offices every five or ten years.

**Learning assessments** include national school-based assessments (or home-based where relevant), designed to measure specific learning outcomes at a particular age or grade. Cross-national initiatives (either regional or global) are based on a commonly-agreed framework and follow similar procedures to yield comparable data on learning outcomes. The number of national and cross-national assessments undertaken in countries has grown, especially in two regions—Latin America and the Caribbean and sub-Saharan Africa. While assessments generally cover initial education well, they are more limited with regard to youth and adults.

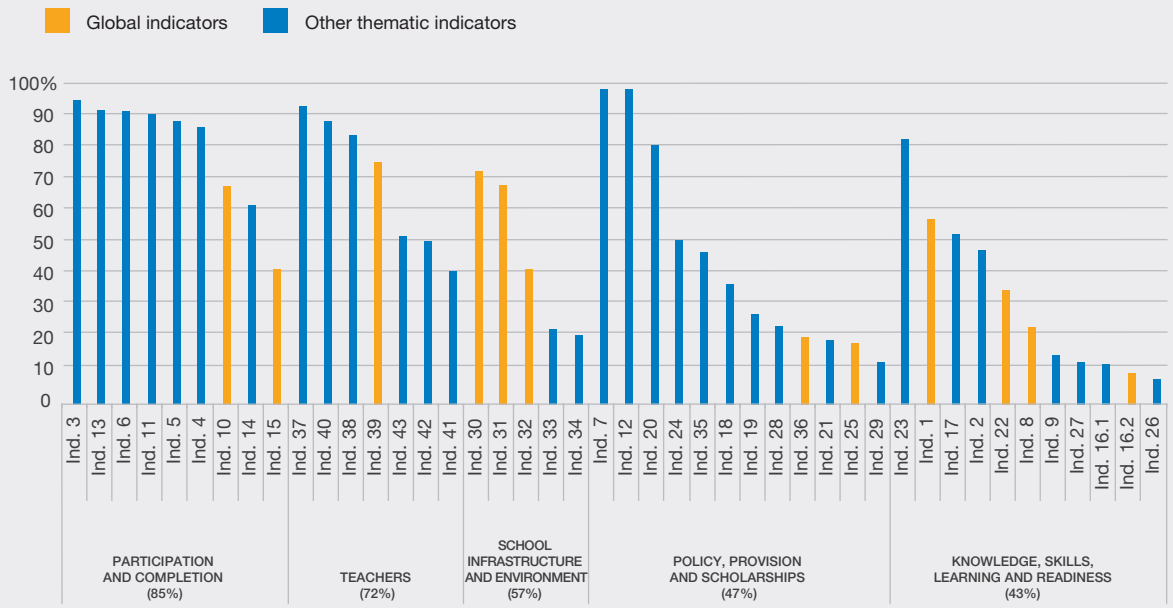
**Financial and expenditure data** include information on government spending on education, such as teacher salaries, which are maintained by ministries of finance and/or education. Public finance data are more widely reported, but there are persistent difficulties in updating and maintaining information on private and other funding sources. To fully understand education expenditure, it is often necessary to rely on other data sources, such as household surveys for private expenditure and ministries or other organizations responsible for overseas development assistance.

*Source: UNESCO Institute for Statistics, 2012A*

When the thematic indicators are grouped by a common theme or concept, it is easier to compare their availability *(see **Figure 7**).* The main themes or concepts used for the thematic indicator framework relate to: participation and completion of education programmes/cycles (9 indicators); teachers (7 indicators); school infrastructure and environment (5 indicators); policy, provision and scholarships (12 indicators); and knowledge, skills, learning and readiness (10 indicators). The highest rates of data availability were found among the first three themes, with countries reporting availability of 85%, 72%, and 57% of data required, respectively, to monitor the targets.

As shown in Figure 7, global indicators (yellow bars) are clustered into two groups: knowledge, skills, learning and readiness (4 indicators) and the school infrastructure and environment (3 indicators). For the first group, data availability appears relatively high, but in many countries the data do not capture the knowledge and skills of children and youth who are out of school; 43% of knowledge, skills, learning and readiness data are reported as being available, but there is considerable variation among indicators within

Figure 7. Data availability by broad concept and individual indicator (%)




*Source: UIS regional assessments of system readiness to monitor SDG 4, 2016*

**Table 5. Data required to monitor SDG indicators related to reading and mathematics proficiency by grade (%)**

| Reading | Grade 2 or 3 | End of primary education | End of lower secondary education |
|---|---|---|---|
| **Asia and the Pacific** | 47 | 50 | 42 |
| **Arab States** | 47 | 65 | 65 |
| **Latin America and the Caribbean** | 81 | 69 | 62 |
| **Sub-Saharan Africa** | 80 | 68 | 33 |
| **All regions** | 65 | 62 | 46 |
| **Mathematics** | **Grade 2 or 3** | **End of primary education** | **End of lower secondary education** |
| **Asia and the Pacific** | 42 | 58 | 47 |
| **Arab States** | 41 | 71 | 65 |
| **Latin America and the Caribbean** | 77 | 81 | 62 |
| **Sub-Saharan Africa** | 65 | 68 | 43 |
| **All regions** | 57 | 68 | 51 |

*Source: UIS regional assessments of system readiness to monitor SDG 4, 2016*

the same group. For instance, only 11 countries (or 9%) stated that they collect data to monitor the ICT skills of youth and adults compared to 84% of countries reporting they have the required data to measure the self-reported literacy rates.

The number of data points to monitor is higher than the number of indicators. For the first target alone, there are three points of measurement (early grades, end of primary education and end of lower secondary education) and for two subjects (reading and numeracy/mathematics). Thus six separate indicators of proficiency would be required nationally to monitor the target. **Table 5** presents data on availability by region for reading and mathematics proficiency. It reflects the common use of educational assessment, according to national frameworks and linguistic contexts, in the early grades of primary education, especially in Latin America and the Caribbean and sub-Saharan Africa. Data for Asia and the Pacific and the Arab States are considerably less available, although still covering almost one-half of the data required.

## 2.2 READINESS TO REPORT DISAGGREGATED INDICATORS

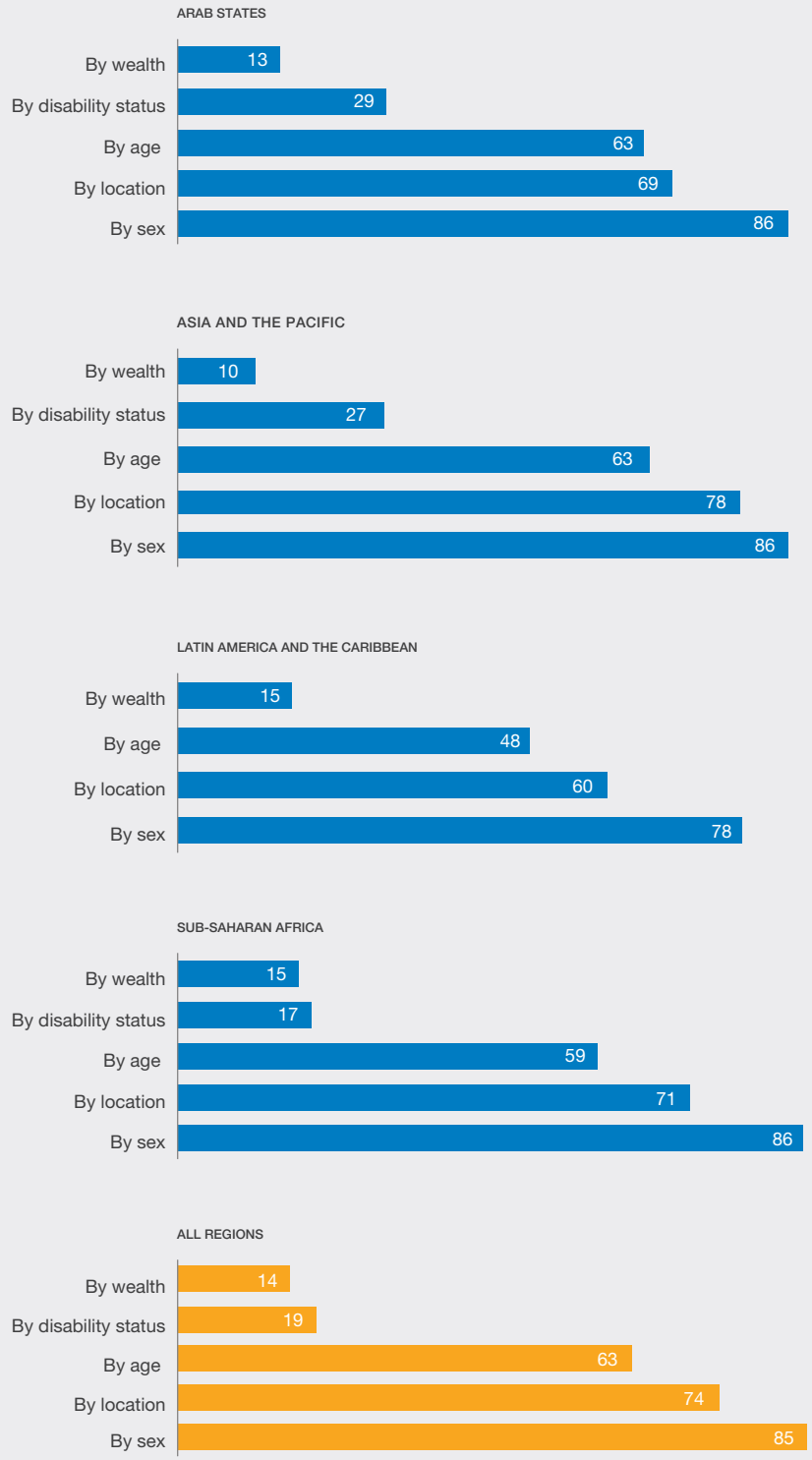
Children, youth and adults left behind in terms of opportunities to learn are at the heart of the education agenda. Assessing their situation requires measuring disparities by sex, age, location, wealth and disability, among other factors, such as migratory status. This implies integrating a range of data sources, not only national household surveys, but administrative data compiled by ministries of welfare or social protection. The global and thematic frameworks call for the disaggregation of indicators wherever possible, with Target 4.5 calling for the systematic use of parity indices. The parity index is a simple ratio calculated by dividing the indicator value for one group (e.g. girls) by the value for a comparison group (e.g. boys).

Are countries ready and able to report on parity indices? Where data are available, most countries are able to report SDG indicators that can be disaggregated by basic individual characteristics, such as sex, age and location (urban/rural households). Information about these characteristics is usually collected through household surveys and individual record-based education management information systems. On the other hand, only a few countries reported availability of disaggregated data by wealth or disability status, which are mostly covered by household surveys *(see **Figure 8**).* For instance, 85% of the available data for the global indicators can be disaggregated by sex, and 74% and 63% by location and age, respectively. However, only 14% of the available data can be disaggregated by wealth and 19% by disability status.

By indicator, only 11% and 19% of participating countries are able to disaggregate measures of student achievement by wealth and disability status, respectively *(see **Figure 9**).* Furthermore, no country in sub-Saharan Africa reported collecting disability status when measuring the proportion of children under five years of age experiencing a positive and stimulating home learning environment (Target 4.2).

In some cases, national standards may differ in administrative data collections. A review of national school census forms (which provide data for EMIS) indicates that nearly all countries collect data on students by urban/rural characteristic and sex. But data on children with disabilities or special learning needs are collected in only 62% of countries, and other population groups (e.g. refugees, out-of-school children, nomadic groups, orphans and vulnerable children) are missing entirely in most national statistics *(see **Figure 10**).* Few countries include national targets to monitor progress in participation and learning for specific population groups with the exception of sex.

Figure 8. Global SDG 4 education indicators by region and type of disaggregation (%)

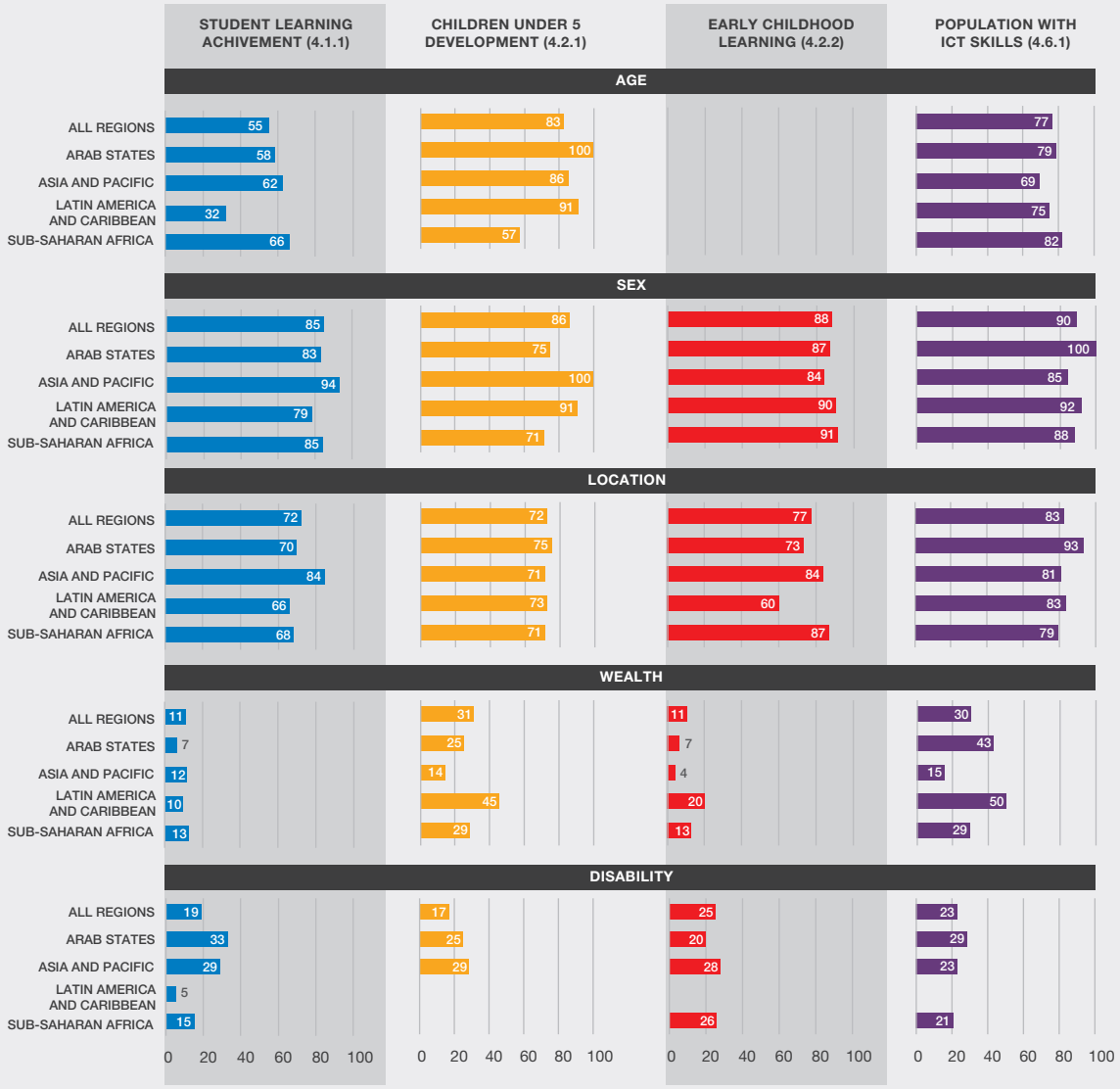



**Note:** The disability factor in the chart for all regions excludes Latin America and the Carribbean.

*Source: UIS regional assessments of system readiness to monitor SDG 4, 2016*

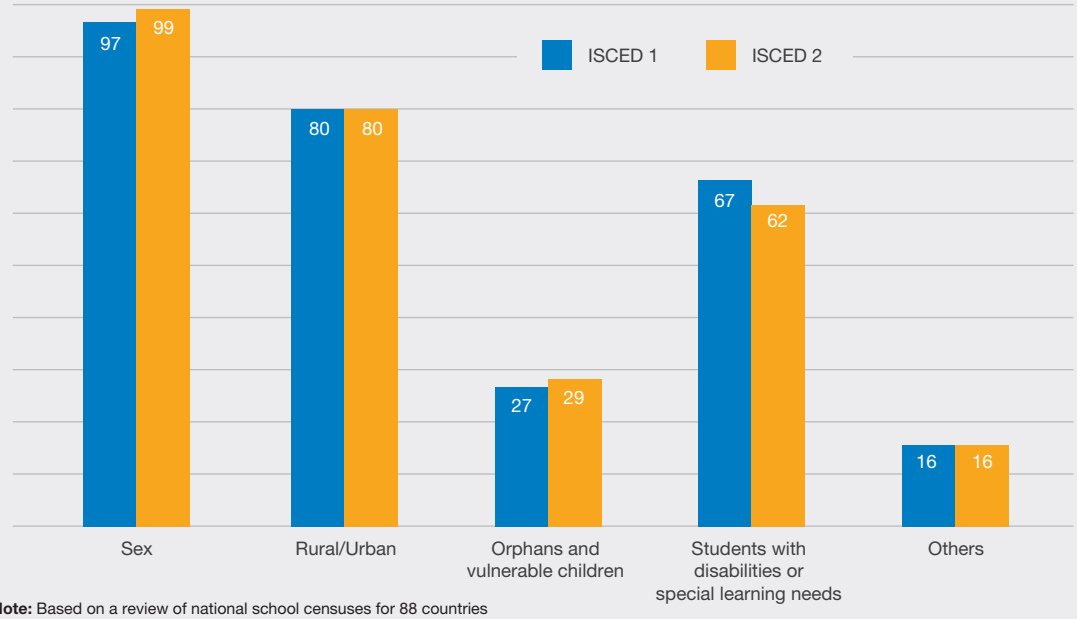
**Figure 11** shows the status of indicators in relation to data availability for the 43 thematic indicators. The UIS assessment of system monitoring readiness also showed that, whenever available, most data required for the production of thematic indicators are fairly timely. Most of these data (89%) refer to the reference school year of 2013 or later. Similar patterns are observed across regions in terms of regular data collection, as 68% of these data are collected annually and 7% every two to five years.

**Figure 9. Selected education indicators by region and type of disaggregation (%)**




*Source: UIS regional assessments of system readiness to monitor SDG 4, 2016*

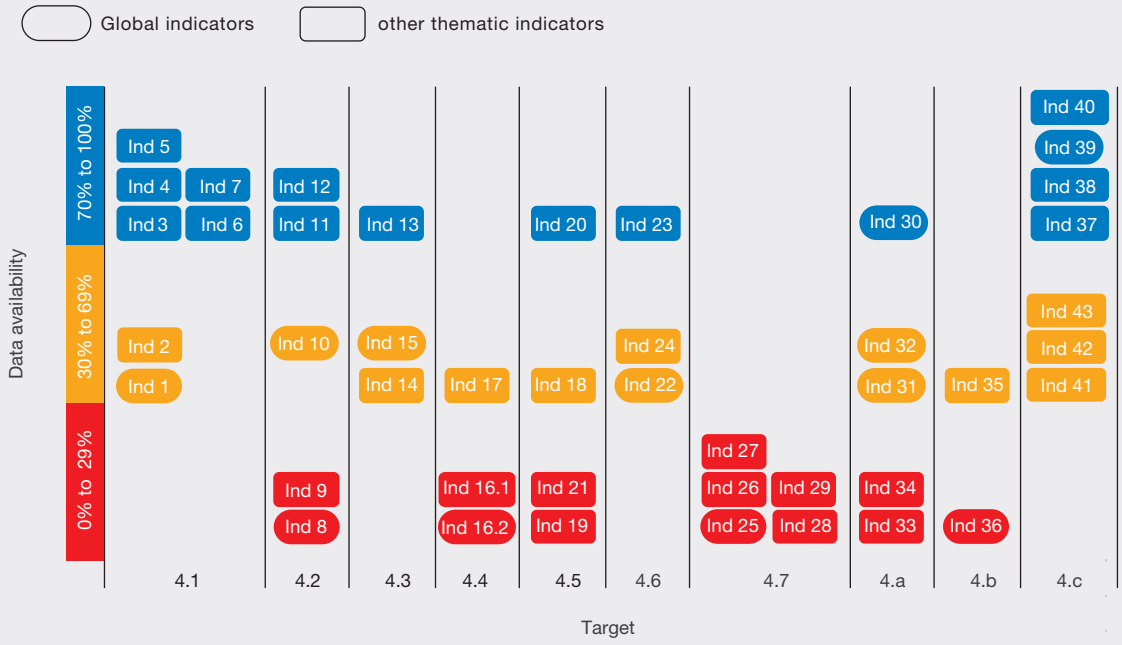
**Figure 10. Individual characteristics of students by national school census collected in selected countries, 2012-2015 (%)**




**Note:** Based on a review of national school censuses for 88 countries

*Source: UIS School Census Database, 2016*

**Figure 11. Distribution of indicators by target and level of data availability**




*Source: UIS regional assessments of system readiness to monitor SDG 4, 2016*

## 2.3 SUPPORTING NATIONAL EDUCATION STATISTICS SYSTEMS: THE KEY TO SDG MONITORING

The ambitious nature of SDG 4 will require new methodological approaches and indicators to address the shortfall in data availability described above. However, establishing and strengthening data quality systemically is perhaps even more important. National education statistical systems already face many challenges, including inadequate funding, weak institutional environments, limited technical capacity, little adherence to international norms and standards, and insufficient coordination at the national level and between national and international stakeholders (PARIS21, 2015).

Data quality reflects the quality of the process that produced the data and should therefore be directed by education planning and measurement objectives. Establishing information systems, surveys and data forms is part of the planning process, and these processes require local actors to be equipped with the means to understand the importance of following established guidelines.

What are some of the critical challenges that countries face in relation to education statistical systems and SDG 4 monitoring? This section identifies areas where international support could help to maintain and improve national education statistical systems. Efforts aimed at strengthening statistical capacity can be organized under three broad areas that address both the demand and supply sides of national education statistical systems: the enabling environment, data production, and data dissemination and use. Together these activities are part of the data revolution that can respond to the needs of the Education 2030 agenda.

### *Enabling environments*

A well-functioning enabling environment includes the legal frameworks, norms and standards that help a country to formalise the roles of different institutions, nurture the growth of national statistical capacity and take ownership of the production of its education data to monitor performance. Stakeholders from across the data spectrum must work together towards improving data availability, quality and reliability by encouraging good governance, transparency and accountability. A weak enabling environment contributes to the deterioration of trust in the national statistical system and a lack of confidence in the reliability of the data it produces. This, in turn, affects the quality of data collected, further reducing the likelihood that data will be used to inform policymaking.

Disparate education data collections reflect fragmentation resulting from the lack of clear identification of responsibilities for data production and protocols for sharing data. This is particularly problematic for measuring the SDG agenda, where linkages across all existing data sources are vital. For example, in many countries, national and international household surveys are often under the responsibility of a national statistical office with little interaction with the ministry of education, which maintains the administrative data information system.

### *Data standards and protocols determine data quality*

Consistent standards are vital for tracking progress. Statistical standards consist of definitions, concepts, classification systems and methodologies. New standards are developed to ensure harmonisation and improve comparability of official statistics, whether within a country or across countries. Overall, these standards can serve as guidelines that enable countries to standardise how data are collected and statistics are produced and disseminated. A data quality assessment, based on the level of development

of a statistical system can help to identify possible interventions. This information could feed into the development of a more comprehensive strategy that sets out needs for developing new data sources and improving existing data sources. Both of these will need to be assessed, extended, improved and integrated with other data sources, in order to streamline inputs into sector-wide policy analyses (*see* ***Box 10***).

### *Data use—serviceability and accessibility*

The last set of challenges is linked to the dissemination and use of education data. Dissemination of data is among the most important responsibilities of statistical agencies, not least to inform policymakers. However, typically, inadequate attention is given to analysis and dissemination, so that statistical outputs are difficult to access and use.

**Box 10. Improving collaboration: Rationale for a code of conduct**

The Education 2030 Framework for Action agenda calls for countries to maintain a more comprehensive approach towards national education statistics. Such a sector-wide approach should: respond to national, regional, and international needs; be part of the national development and poverty reduction strategy; serve as a framework for international and bilateral assistance; integrate different aspects and units of the data production chain; bring together data users and producers to address issues related to improving the analysis and use of data; follow international standards including data quality; and build on past and existing activities and experiences.

In order to advance the agenda it is necessary to expand the role of the international community in supporting country responses to one that extends beyond the various United Nations system entities supporting national statistical capacity development to include other stakeholders and civil society.

This will demand a code of conduct that respects common principles, values, standards, or rules of behaviour in order to ensure a collective approach on the technical side that will also, in the end, respect national ownership and national policy goals.

All actors working to improve educational statistics should subscribe to the following principles, as a way to guide their conduct. The Principles Governing International Statistical Activities regarding good practices (see http://unstats.un.org/unsd/accsub-public/principles_stat_activities.htm), developed and endorsed by the Committee for the Coordination of Statistical Activities, include:

- High quality international statistics, accessible for all, are a fundamental element of global information systems.
- To maintain the trust in international statistics, their production is to be impartial and strictly based on the highest professional standards.
- The public has a right to be informed about the mandates for the statistical work of the organizations.
- Concepts, definitions, classifications, sources, methods and procedures employed in the production of international statistics are chosen to meet professional scientific standards and are transparent for users.
- Sources and methods for data collection are chosen to ensure timeliness and other aspects of quality, e.g. to be cost-efficient and to minimise the reporting burden for data providers.
- Individual data collected about natural persons and legal entities, or about small aggregates that are subject to national confidentiality rules, are kept strictly confidential and are to be used exclusively for statistical purposes or for purposes mandated by legislation.
- Erroneous interpretation and misuse of statistics are appropriately addressed.
- Standards for national and international statistics are developed on the basis of sound professional criteria, while also meeting the test of practical utility and feasibility.
- The coordination of international statistical programmes is essential to strengthen quality, coherence and governance.
- Bilateral and multilateral cooperation in statistics contribute to the professional growth of the statisticians involved and to the improvement of statistics in the organizations and in countries.

*Source: UN, 2014*

In existing international frameworks related to the quality of education data there are two dimensions that are linked to data dissemination and use: serviceability and accessibility. The dimension of serviceability refers to the extent to which statistics are useful for planning or policy purposes. It concerns mainly periodicity, timeliness and consistency. Data are timely when they are current or up-to-date. Data must be on time and available when they are required, otherwise the credibility of the information system is diminished. If data are accurate, serviceability refers to the extent to which they reflect a reality either current or in the past. Data accessibility – presenting data and metadata in a clear and understandable way which is easily available to users – is an aspect that is often overlooked. Metadata (description of the data) should also provide relevant information and be regularly updated. The overall objective is to ensure that data are not just produced but used to their full potential.

### *How to improve data systems*

At the country level, it is important to strengthen coordination between agencies and to enhance the leadership role of the ministry of education alongside national statistical offices *(see **Table 6**).* Countries should have a national education sector-wide strategy for producing education statistics which is part of their national statistical development strategies *(see **Box 11**).*

At the regional and international levels, countries should also be supported to play a more visible role in defining international standards. Moreover, international partners should help by mobilising resources, providing standards, convening experts and sharing global good practice and building strong enabling environments.

**Table 6. National and international objectives to improve data systems**

| | Sound data production | Improved data dissemination | Strong enabling environment |
|---|---|---|---|
| **National statistical systems** | EMIS as the cornerstone of monitoring, integrate different data sources to cover all SDG 4 targets, map needed improvements, leverage technologies, improve quality assurance of data, introduce new data collections | Regularly report data; leverage new technology, increase data literacy and the use of education statistics for policymaking, disseminate data and metadata in a user-friendly format | Develop national strategies for education statistics, align political commitment and resources invested in statistical capacity, promote collaboration across ministries, encourage stakeholder engagement |
| **International support** | Robust and transparent global statistical process, apply international standards across the board, include countries in the validation process, mobilise all data sources (administrative, household surveys, learning assessments), provide diagnostic tools and guidelines | Provide data as a public good; reduce transaction costs of data exchange, transfer knowledge and ownership to countries, provide standards, tools and methodologies, share good practices in implementation | Clear definition of roles and responsibilities, change mindset for capacity support, participatory approach to the development of international standards and methodologies, ensure inclusion of all populations mobilise resources to address gaps |

*Source: UNESCO Institute for Statistics*

### Box 11. National strategies for the development of education statistics (NSDES)

To comprehensively monitor SDG 4-Education 2030, countries can benefit by integrating a sector-wide vision of education like an NSDES within their national strategies for the development of statistics (NSDS). This strategic vision underpins the entire national education statistical system (NESS).

To be effective, this sector-wide approach must include national, regional and international needs; be part of the country development and poverty reduction policy; serve as a framework for international and bilateral assistance; include all aspects and units of the data production chain, bring together data users and producers, and address the issues related to the analysis and use of data; follow the international standards including quality; and build on existing activities and experiences.

*Source: UNESCO Institute for Statistics*

Technical capacity is a key limitation across data production and use. Statistical units are often understaffed, face high turnover and an ever-increasing number of demands for data production. In addition, education statisticians may be well versed in their own area (e.g. students, teachers, schools) but have limited knowledge and understanding of other data sources, which can require a different set of skills.

Outdated technologies and a lack of infrastructure for dealing with big data sets and data from multiple sources are another constraint. Too many countries are still recording school census data on paper, which is error-prone, time-consuming and often results in partial data collection. On the other hand, data collection using computer technology can also be problematic when electricity and Internet connectivity cannot be assured. Collecting data in rural and isolated locations presents an additional challenge.

To improve data production and dissemination, it is essential to support efforts at the country level (*see* ***Table 7***). Countries should adopt and use key

**Table 7. Actions to strengthen national capacities**

| Objective | Improving core data collections (supply side) | Improving linkages between education and other sectoral systems | Improving use of data (demand side) |
|---|---|---|---|
| Activity | Map data sources (admin., census, survey-based, etc.) and data users | Integration across data sources and levels of government | Introduce common data analysis, visualisation and reporting approaches |
| Activity | Introduce recognised design standards, frameworks and methodologies (e.g. NEAs). Frame and develop new indicators. | Support national coordination mechanisms (national statistical offices, assessment centres, line ministries) | "Create" demand: incentivise, train, support policy relevant indicators |
| Activity | Data quality assessment by data source (SABER, DQAFs, data plans, finance comparability study) | Harmonise design across data collections | Framing and developing indicators |

*Source: UNESCO Institute for Statistics*

principles, the right of users to access data should be advanced, and key technical standards should be promoted and their adoption actively monitored.

In terms of international support, many UN agencies provide technical assistance through experts and publications that provide guidance on the uses of statistical methods and standards to help strengthen statistical capacity development *(see **Box 12**).* The UIS has its own programme of support for countries directly relevant to education statistics *(see **Box 13**).* Technical assistance can help to provide direction in the conduct of statistical programmes while supporting countries to adopt internationally-accepted methodologies and standards and foster enabling environments for the production of statistics. Countries may also require specific technical guidance from experts to operationalise international recommendations within their specific national contexts and constraints in data availability.

An important contribution at the international level will be identifying the innovations that work best in different contexts. Given the lack of resources in many low income countries, much of the necessary research and development will occur at the regional or international level. So it is essential to ensure that these developments directly reflect the specific needs and concerns of developing countries, including those with the least resources.

Supporting national capacity development in education statistics will require changes at different levels (e.g. individual, institutional and enabling environment). Various programmes have been implemented by international partners to strengthen capacity by improving knowledge, skills and competencies of staff and leadership; supporting primary data collection and the production and dissemination of official statistics; the development or refinement of national statistical standards and

### Box 12. Role of the UN in supporting statistical capacity development

Perhaps the most effective approach to strengthening statistical capacity lies in making the connection that better data can lead to better lives. This is a key role of the UN in promoting the use of statistics to achieve national development goals.

In particular, it must be emphasised that statistics cannot be used only for monitoring of progress but also for in-depth analysis in order to identify the underlying causes of obstacles to achieving development goals. Statistical capacity development should be seen as a major priority and the mandates of key UN agencies should be reviewed and clearly defined. Overall, the goal is to harmonise methodologies and fill the gaps in existing data collections by creating a set of good global practices. Efforts by the UN and other organizations can lead to strengthened national capacity, increased standardisation and subsequently better quality of collected data and more meaningful analysis.

Norms and standards defined by UN entities, which are staffed by experts in their field who work closely with Member States, are a prerequisite for internationally-comparable data of high quality. International organizations provide technical training and other support that is crucial for enhancing capacity in national institutions. The UN system plays a key role in the process of coordination between different initiatives, which helps avoid inefficient and wasteful use of financial and human resources. Lastly, by keeping internationally-agreed development goals high on the agenda, the UN can promote the use of good data in support of good policy.

*Source: UN, 2016*

classification systems; improving alignment with international statistical standards and practices; and improving statistical infrastructure and coordination. This also encompasses tools for data management and dissemination. With the growing availability of new technologies, national statistical systems have been supported by international agencies in the establishment and use of various tools for database management and dissemination.

### Box 13. The UIS role in countries: standards, training, technical assistance, tools and advocacy

The UIS is the custodian of the key classifications, standards and methodologies that are implemented by countries to ensure the cross-national comparability of education indicators. A key classification is the International Standard Classification of Education (ISCED) which was adopted by the UNESCO General Conference in November 2011. Initially developed by UNESCO in the 1970s, and first revised in 1997, ISCED serves as an instrument to systematically organize, compile and present education statistics nationally and internationally. The UIS maintains the classification of fields of study, sets out key measurement concepts and maintains methodologies for assessing data quality.

Another key example of the UIS standard-setting role relates to data collected through household surveys. For example, the UIS is a member of the Intersecretariat Working Group on Household Surveys which was established by the UN Statistics Commission in 2015, with the mandate to promote the development of international statistical standards and other methodological documents related to all relevant phases of survey implementation (design, sampling, data collection, data editing, data processing and analysis, data curation and dissemination). Efforts aim to improve the quality and availability of household survey data and metadata generated and published by national, regional and international organizations. The UIS also contributes to a Task Force leading the standards setting for household survey based education expenditure to name another key example of work in this area.

In addition, the UIS organizes regular regional technical workshops in its areas of responsibility (education, science, culture and communication) to build national capacities by providing the necessary training for statisticians to produce, compile and report cross-nationally comparable statistics. These activities are demand-oriented and tailored to the specific needs of countries. They also provide an opportunity for national representatives to understand and apply international recommendations on statistical standards and practices while providing feedback towards their ongoing development.

In this context, the UIS has established a network of statistical advisors who are based in UNESCO regional offices and cluster offices around the world. By reinforcing networks and providing technical assistance in producing and using education data, UIS advisors seek to improve data quality at both the national and international levels.

*Source: UNESCO Institute for Statistics*

# 3. Implementing the SDG 4-Education 2030 measurement agenda

In the preceding sections, the Digest has described how the SDG 4 - Education 2030 global and thematic indicator frameworks were defined and the extent to which countries are ready to produce the data needed for the indicators. For effective monitoring it is clear that an effort to harmonise measurement needs to be made in order to generate measurement tools that:

- yield data on outcomes
- define benchmarks
- provide repeated measurements for monitoring
- have a capacity for action (human, financial and technology)

SDG 4 monitoring requires a considerable amount of new and additional data which requires concerted action at the national and international levels. Countries need support in expanding the data sources required to monitor the new targets. In parallel, there must be coordinated efforts at the regional and global levels to improve the availability and quality of data by: systematically strengthening national statistical capacities, especially in situations where no data are available; and developing the methodologies and mechanisms for countries to report high-quality internationally-comparable indicators.

This section describes the global architecture to implement the SDG 4-Education 2030 thematic indicator framework and focuses on the specific challenges in measuring key targets related to learning and equity. The final section presents a roadmap to address these issues by highlighting several global initiatives led by the UIS.

## 3.1 THE UIS IN GLOBAL EFFORTS TO MONITOR THE SDGS

As UNESCO's statistical agency, the UIS continues to actively contribute to UN-system processes to ensure good coordination among agencies for all of the SDGs. These include the UN Statistical Commission as well as long-established groups such as the Committee for the Coordination of Statistical Activities and the UN Chief Statisticians Group, which continue to build on fundamental principles to ensure the quality and integrity of the processes and data of all UN agencies producing statistics.

The UIS is also part of several new groups that were recently formed around the SDGs, such as the Data Revolution Working Group of the Chief Executives Board and the UN Development Group's Inter-Agency Task Team on SDG Country Reporting.

### *Inter-agency groups to resolve technical issues*

The UIS is also part of a number of inter-agency groups to resolve technical issues related to statistical standards and processes across the UN system. Some are convened by the UN Statistics Division, including the Inter-agency and Expert Group on Gender Statistics and the Intersecretariat Working

Group on Household Surveys. Others are convened by specialised agencies, such as PARIS21 (with the UIS serving as a member of the Advisory Board) which focuses efforts on national statistical capacity building, and the Expert Group on Indicators for Water, Sanitation and Hygiene (WASH) in Schools, convened by UNICEF. Other key initiatives involving the UIS include: the SDG Data Roadmaps and Ecosystems Working Group, convened by the Global Partnership for SDG data.

UNESCO and the UIS have also established a number of technical groups including the Inter-agency Group on TVET co-convened with the European Training Foundation, ILO, OECD and the World Bank, as well as expert groups and task forces on teachers, violence in schools, and other topics related to specific education targets.

Finally, the UIS itself has created several expert groups to take forward the methodological development of indicators and the establishment of standards and good practices in specific areas of relevance to the SDGs. These include the Global Alliance to Monitor Learning *(see* ***Box 14***), the Inter-agency Group on Education Inequality Indicators (*see* ***Box 15***) and a task force within the Intersecretariat Working Group on Household Surveys on Education Expenditures (*see* ***Box 16***).

## 3.2 INTERNATIONAL ARCHITECTURE FOR SDG 4-EDUCATION 2030

As previously explained, UNESCO's Member States adopted the Education 2030 Framework for Action in November 2015. This was the result of a collective effort involving consultations driven and owned by countries, and facilitated by UNESCO as well as other

### Box 14. A new global alliance for learning

The Global Alliance to Monitor Learning (GAML) is a multi-stakeholder initiative aimed at addressing measurement challenges based on consensus and collective action in the learning assessment arena while improving coordination among actors. The secretariat is hosted by the UIS, which can draw on its own broad experience in global assessment. The GAML is an umbrella initiative to monitor and track progress towards all learning-related Education 2030 targets. The platform organizes expert group meetings and consultations with stakeholders to develop new frameworks for learning indicators. The indicator proposals from GAML will be submitted to the TCG which will consider how to scale up solutions.

The GAML will remain focused on the pragmatic methodologies needed to ensure that learning outcomes are inclusive, while striking a balance between priorities and constraints of different stakeholders, whether governments, international organizations or civil society groups. The UIS is working with partners, within the GAML, to develop standards, guidelines and data quality frameworks for learning assessments. These frameworks will help countries to align their national assessments within a common scale for reporting.

This Alliance is designed to achieve a set of inter-related goals: i) ensure technically-sound and reliable approaches to measuring learning; ii) develop innovative methodologies for the measurement of learning; and iii) strengthen country, regional and global capacity to implement reliable measurement of knowledge and skills.

It will identify the best possible strategies to produce the global indicators necessary to monitor the learning goals in SDG Targets 4.1 (learning outcomes at the primary and lower secondary education), 4.2 (early childhood development), 4.4 (work and skills), 4.6 (adult literacy skills), and 4.7 (global citizenship development), including the most effective ways of engaging and supporting countries. Currently the priority is developing the necessary governance structure and management mechanisms.

*Source: UNESCO Institute for Statistics*

## Box 15. Inter-agency Group on Education Inequality Indicators

In response to the call for a greater focus on equity and data disaggregation in the SDGs, the UIS, UNICEF, the World Bank and other partners established the Inter-agency Group on Education Inequality Indicators (IAG-EII) in 2016. The main objective is to promote and coordinate the use of household survey data for monitoring of education targets at the global, regional and national level, ensuring standardised analysis and reporting in order to complement evidence available through administrative data.

To achieve this goal, the IAG will support the following activities:

- produce recommendations to harmonise the processing of survey data by different agencies;
- document data requirements and calculation methods for indicators;
- advise on methods for harmonising the definitions of individual and household characteristics for data disaggregation;
- prepare guidelines for producers and users of survey data;
- advise on education questions in surveys;
- offer guidance on incorporating information from other data sources;
- consult with countries on indicator methodology; and,
- liaise with other UN bodies working on education data from household surveys.

*Source: UNESCO Institute for Statistics*

## Box 16. Setting standards for the use of household surveys to estimate education spending

UIS is a member of the management team coordinating the Intersecretariat Working Group on Household Surveys (ISWGHS) established by the UN Statistical Commission in 2015. Within the ISWGHS the UIS leads a Task Force on Standards for Education Spending Estimates based on Household Survey Data. Household surveys are a valuable source of information on household expenditure on education, including on tuition and other fees for education services, as well as out-of-pocket expenditures. Surveyed households are typically asked to estimate expenses incurred on selected items over a given period of time, including the education of household members. Most of these surveys include information on enrolment status (level and grade of education, type of school, etc.) and on the socioeconomic and demographic characteristics of household members (location, wealth, etc.). It is thus possible to use this information to estimate the private contribution or expenditure per enrolled child by level of education and disaggregated by other relevant dimensions.

*Source: UNESCO Institute for Statistics*

agencies and partners (E2030 FFA, 2016). As stated in the Framework, the UIS plays a central role in the production of the global and thematic indicators and remains the official source of cross-nationally comparable data (*see* ***Figure 12***). The Institute will continue to conduct regular surveys to produce the data while working closely with partners to develop new indicators, statistical approaches and monitoring tools to better assess progress across the targets (E2030 FFA, 2016).

In effect, the UIS is the custodian agency for the global indicators that countries selected for SDG 4. This means that the internationally-comparable indicators that are used to track progress globally will be reported by countries to the UIS which will

disseminate the indicators (*see* ***Box 17***), including through the Global SDG Indicator Database of the UN Statistics Division *(see Figure 12).*

Clearly, no single organization can produce all the SDG 4 indicators. The UIS is therefore working with Member States and partners to establish the international architecture to implement the indicators. In this complex process, technical issues will be clearly and openly resolved in order to generate reliable and sound data that adhere to the fundamental principles of official statistics (UN General Assembly, 2014). To produce data that are recognised and used at the national, regional

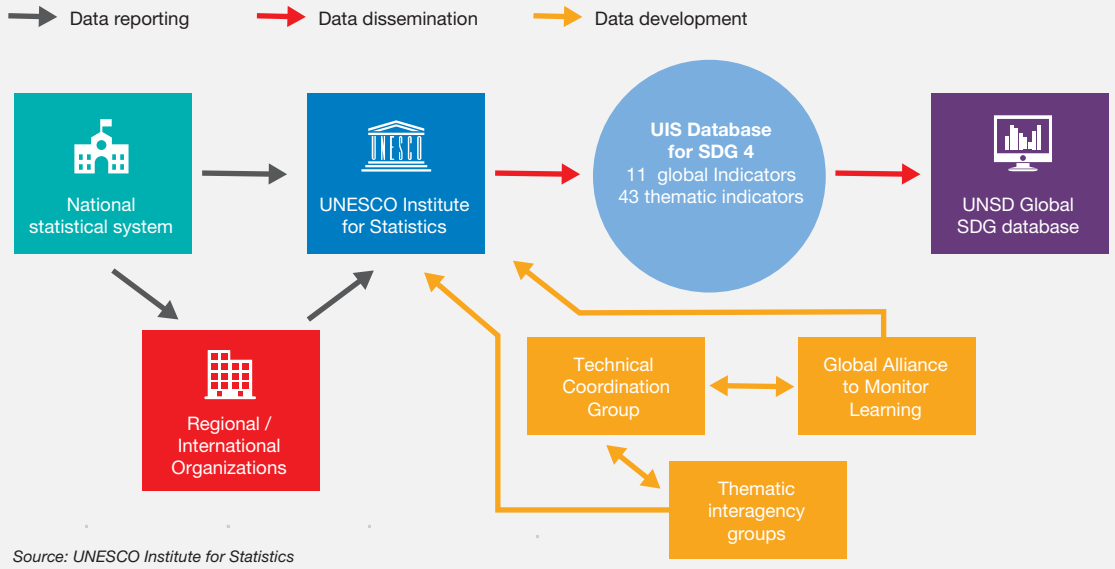
## Box 17. eAtlas for Education 2030: The go-to source for the latest available data

Launched by the UIS, the eAtlas for Education 2030 presents all the global and thematic indicators currently available. This ground-breaking series of interactive maps is organized by every SDG 4 target for every country with available data, and is updated automatically as soon as new figures become available. It is designed to become the go-to source for education data: a place where anyone can get the data they need quickly, and feel confident that they are getting the best and most up-to-date statistics.

With just a couple of clicks, it is possible to explore a wide range of data, such as completion rates from primary to tertiary education, the percentage of children out of school, the average amount spent per pupil, and the supply of qualified teachers. There are map views on gender disparities, the relevance of education, the safety of the school environment, and the number of adults enrolled in primary education programmes, among many other topics. Every map view can be customised, shared via social media and downloaded. The eAtlas is a "work in progress", and includes placeholder indicators for those that are not yet available in a sufficient number of countries.

*Source: UNESCO Institute for Statistics*

**Figure 12. The UIS as the custodian agency for SDG 4 data**




*Source: UNESCO Institute for Statistics*

and international levels, it is essential to develop a process and mechanism that is: open to feedback from the political decisionmakers and stakeholders; inclusive and transparent, allowing the participation of countries, civil society organizations and international organizations; and fully coordinated within the SDG global monitoring mechanisms and political bodies responsible for guiding the implementation of the agenda.

Following the principles stated above, the UIS has proposed that the TCG on the Indicators for SDG 4-Education 2030 serve as the global platform for countries and education stakeholders to discuss, develop and implement the global and thematic indicator frameworks (*see* ***Box 18***).

## 3.3 IMPLEMENTATION STRATEGIES FOR SDG 4 INDICATORS

To implement the global indicator framework for SDG 4, the Inter-Agency and Expert Group on SDG Indicators is currently classifying each of the global indicators into one of three tiers based on data availability and level of methodological development *(see* ***Box 19****).* This exercise should help identify which indicators will require additional resources to develop or strengthen methodologies and standards while also

### Box 18. Paving the way forward through the TCG

Established by the UIS, the TCG on the Indicators for SDG 4-Education 2030 brings together Member States and major stakeholders to recommend approaches and actions to develop the methodologies and improve data availability to produce the thematic monitoring indicators.

In particular, the TCG will provide the technical platform to support the implementation of the thematic indicator framework on SDG 4-Education 2030, ensuring the use of agreed-upon indicator definitions and sharing experiences of good practices and innovations at different levels of the indicator production process; supporting the work of the IAEG-SDGs, relevant regional bodies and countries related to the implementation of the global monitoring framework and the design of the regional monitoring frameworks, and assuring the coherence of those processes; guiding the production of technical documentation needed for clear communication of the thematic indicators to monitor SDG 4-Education 2030; coordinating the development of guidelines and strategies to support countries in analysing and reporting on SDG 4-Education 2030; and informing the SDG 4-Education 2030 Steering Committee on the implementation of the thematic monitoring framework on education, providing the necessary inputs to periodically assess their coverage.

The TCG is a technical centre of excellence on education measurement across the different areas covered by the SDG 4 targets. Chaired by the UIS and UNESCO Education Sector's Division for Education 2030 Support and Coordination (ED/ESC), it includes representatives from:

- UNESCO: UIS, UNESCO Education Sector and GEMR.
- UNESCO Member States (28 members): All countries that are members of the IAEG (*see* ***Box 4***) were invited to join, considering that they were elected in each of the regions to lead discussions to define the global monitoring indicators. This regionally representative group will help to coordinate the work of the TCG at the global level. It is expected that after an initial period of two years, other countries will be considered for membership.
- multilateral SDG 4 monitoring partner agencies: UNICEF, OECD and the World Bank are members given their key roles as reporting agencies of data for the global and thematic monitoring frameworks.
- civil society organizations: Education International and a second member nominated by the Collective Consultation of NGOs Coordination Group. The Global Partnership for Education.

*Source: UNESCO Institute for Statistics*

**Box 19. Definition of the tiers for indicators**

Two main criteria are used to classify indicators by tiers: methodological availability and coverage. The tiers classify indicators as follows:

**Tier 1:** indicators with an established methodology and data already widely available

**Tier 2:** indicators with an established methodology but insufficient data coverage

**Tier 3:** indicators for which a methodology is being developed

*Source: UNDESA, 2016*

helping to identify suitable data collection approaches. The IAEG-SDGs members are preparing a work plan in consultation with the international and regional organizations responsible for developing each of the Tier 3 indicators provisionally suggested by the UNSD as well as by international and regional organizations.

For the SDG 4 thematic indicator framework, the UIS has proposed that the TCG adopt a similar approach for identifying which thematic education indicators will require further development. This entails developing detailed metadata, assessing the data availability at the country level to produce the indicators and selecting possible temporary placeholders, as well as defining the process and timeline to produce the indicators.

According to a preliminary evaluation of the thematic education indicators, 12 out of the 43 indicators are Tier 2, while 8 are Tier 3. The rest are Tier 1 (*see* ***Table 8***). This initial assessment is helping to guide the work of the TCG throughout 2016.

It is important to note that although Tier 3 indicators require the most significant effort to establish measures, the challenge related to data availability (Tier 2) will mean not having statistics for several countries for the immediate future. Therefore, for some of those cases, a number of temporary placeholder indicators has been identified. These will ensure that monitoring can initially be based on an indicator that captures a concept similar to the one not yet widely measured by countries. The following criteria to define a good placeholder are being reviewed by the TCG:

- proximity of the placeholder to the concept measured by the original indicator;
- proximity of the placeholder to the target being measured;
- cross-national comparability of the placeholder (at least for sub-groups of countries if not globally);
- country and regional coverage; and
- sufficient periodicity (i.e. at least once every five years).

### *Next steps*

The roadmap for the global and thematic indicator frameworks has been clearly set out in terms of immediate actions.

- To further address the global indicator framework the IAEG-SDGs will meet in October 2016 in Addis Ababa, Ethiopia. In the interim period, the group aims to finalise the tier system, create the four working groups, develop plans for reviewing the indicator framework and collect detailed metadata and plans from international agencies for developing indicators in tier 3. The Group will continue to meet twice a year.

**Table 8. Number of SDG 4 thematic indicators by target, Tier 2 and Tier 3 classification**

| SDG 4 targets | Number of indicators | Tier 2 indicators (limited data availability) | Tier 3 indicators (methodology under development) |
|---|---|---|---|
| 4.1 | 7 | 1 | |
| 4.2 | 5 | 2 | |
| 4.3 | 3 | 1 | |
| 4.4 | 2 | 2 | |
| 4.5 | Parity indices + 4 | | 2 |
| 4.6 | 3 | 1 | |
| 4.7 | 5 | 1 | 3 |
| 4.a | 5 | 2 | 1 |
| 4.b | 2 | | 1 |
| 4.c | 7 | 2 | 1 |
| **TOTAL** | **43** | **12** | **8** |

*Source: UNESCO Institute for Statistics*

- The thematic indicator framework will be advanced by the Technical Cooperation Group. At the last meeting of the TCG, two working groups were formed to address immediate implementation issues. The first working group is undertaking a review of the current indicators and their alignment with the SDG targets in order to propose possible additions of new or dropping of existing indicators. The second working group is reviewing the current framework and will propose changes to tier classifications and placeholder indicators. Placeholder indicators are those which could be used on a temporary basis, until the further development and/or increased availability of selected indicators. The TCG meets in Madrid, Spain in October 2016 in order to address implementation issues and form new task forces which will take forward the technical development of priority indicators in 2017. The TCG will work closely with the Global Alliance for Monitoring Learning and the Inter-Agency Group on Education Inequality Indicators.
- The Global Alliance for Monitoring Learning will meet in October 2016 to finalise its governance structure, charter and operational plan. By the end of 2016, GAML will have defined the charter for the initiative that will act as a declaration of shared values, vision and mission. The UIS-based secretariat for GAML is setting the overall strategy (through the Steering Committee), defining technical priorities (through the Technical Advisory Group) and developing detailed workplans for each of the Task Forces (through defining the terms of reference). The secretariat is presenting a draft data quality assessment framework, an empirical learning scale for reading and mathematics in primary education, and elements of an operational plan for individual Task Forces. To ensure adequate technical support, Memorandums of Understanding have been signed with the Australian Council for Educational Research— Centre for Global Education Monitoring (ACER-GEM) and UNESCO's International Bureau of Education (IBE) on technical development issues.

- To facilitate the work of these groups in the implementation of the indicator frameworks for tracking progress, the research community should be properly aligned to the needs of measurement and monitoring (*see* ***Box 20***).

### Box 20. Supporting the development of SDG indicators with a well-aligned research agenda

With the adoption of the ambitious targets and monitoring frameworks for education in the agenda for Education 2030, the next challenge is to identify and coordinate the efforts needed to ensure effective implementation of the monitoring framework, especially in relation to the key themes related to education: quality, learning, inclusion and equity. To succeed, this effort will require broad partnerships across stakeholders, as well as targeted support to build the global methodological infrastructure needed to advance the agenda.

The benefits of such targeted support will be to allow countries to better meet their ongoing needs for timely expert consultation with academic and industry experts to generate cutting-edge statistical approaches to improving data from different sources, including EMIS, learning assessment and household surveys.

Several potential models for research networks and consortiums have been successful in making an impact on improving education statistics at a regional or national level and in other sectors that can inform an approach at the global level for education.

At the country level, the Education Statistical Services Institute (ESSI) started out as a consortium of 12 organizations with a budget of USD10 million annually for ten years supporting the work of the National Center for Education Statistics (NCES) in the United States. Drawing on the expertise of the different organizations, NCES was able to advance new measurement methodologies in the areas of learning assessments, children with special needs, early school-leaving indicators, and many other areas.

At the regional level, OECD countries support networks of statisticians who advance methodologies in specific areas which are implemented by research networks in member countries. These include the network for the Collection and Adjudication of System-Level Descriptive Information on Education Structures, Policies and Practices (NESLI) and the Labour, Market, Economic and Social Outcomes of Learning (LSO) network for data development. Both networks have developed new indicators (early childhood development, teachers, international students) and research on the complex relationships between education, labour markets, economic performance and social progress.

In other sectors, the Consultative Group for International Agricultural Research (CGIAR) is an interesting case. It represents a consortium/network of research organizations that successfully addresses a wide range of policy questions in agriculture and nutrition. Its experience provides valuable lessons in agenda-setting, implementation plans and the links between research and capacity building.

In relation to the SDG measurement agenda, potential partnership activities that would contribute to better SDG monitoring include: evaluating statistical standards, developing global metrics for learning and other areas, sharing good practices for designing household survey-based education modules, improving current school-age population estimates, developing teacher training taxonomies, considering equity measures and their uses, refining modelling and literacy and attainment projections methodologies.

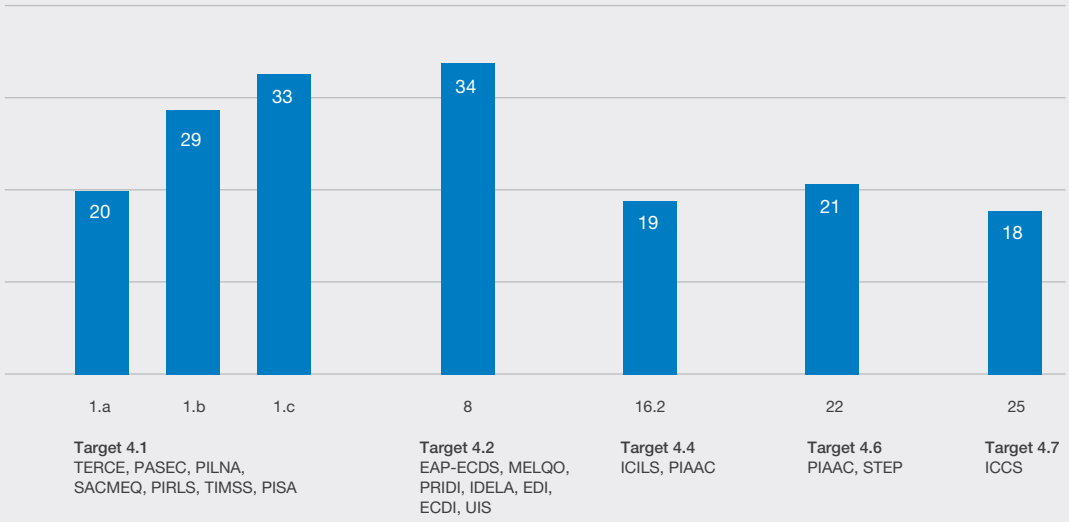
*Source: UNESCO Institute for Statistics*

# 4. The key SDG priorities: Measuring learning, education quality and equity

The focus on education quality and equity presents significant new measurement challenges. Five of the ten targets for education require direct measures of learning outcomes for children, youth and adults. The availability of data to calculate the indicators for these targets is uneven across the world, as shown in Section 3. For cross-nationally comparable assessments of learning *(see **Figure 13**),* country participation varies from about one in five for adult literacy studies to one in three for student assessments at the end of lower secondary education.

In addition, countries and the international community must address the cross-cutting nature of the equity issues raised in SDG 4. In particular, Target 4.5 calls for the elimination of disparities in order to ensure equal access to all levels of education for the vulnerable. This means that indicators across all the education targets should be disaggregated by sex, location, wealth and disability status (as well as other personal and household characteristics, where relevant) in order to identify and address the barriers that so many groups continue to face.

**Figure 13. The share of countries that have participated in cross-national assessments by target (%)**




*Source: UNESCO Institute for Statistics*

This section provides an overall perspective on the challenges before focusing on the specific measurement issues related to key targets. The report then shows the way forward to fully implement the global and thematic indicator frameworks.

## 4.1 THE CHALLENGES OF MEASURING LEARNING

Measuring learning and skills is complex. There are similarities in how children develop cognitively but the wider contextual environment still influences at what age skills are acquired. While cultural and contextual differences are important, children everywhere do show similarities in how they learn to communicate with others, how they solve mathematics problems, and how they learn to read and write.

For the most widely measured areas of learning—reading and mathematics—there is already a basis for global measurement, provided that national standards for primary and secondary education are used to inform local goals for the learning development of children and youth. However, this is not the case for the new global education agenda's focus on skills development in school and work to acquire the knowledge and values that promote citizenship, empathy, tolerance and sustainability.

For all areas, it is critical to address the technical and political challenges to measure learning and achieve SDG 4.

### *Technical challenges*

Despite the growing number of learning assessments, there is currently no framework to reconcile the differences between the various types of assessment to produce cross-nationally comparable data. The fragmented nature of various initiatives, which are often insufficiently coordinated and not harmonised in terms of standards, creates friction, duplication, and inefficiencies in the overall system. **Table 9** presents some of the major differences between assessments.

### *The political challenges*

Assessments can be used to inform policy decisions and better target resources. Governments spend millions of dollars on education yet are still far from the goal of ensuring quality services to all. With better information, they can, for example, track curriculum implementation and better identify correlates of learning. Assessments can also be used to improve accountability and governance across education systems and within schools.

However, assessments are also a source of controversy raising difficult issues that cannot be ignored. The political sensitivity and defensiveness associated with these tools stem not only from the manner of their implementation, but also from the dissemination and use of the resulting data and how this information is presented to different stakeholders.

Much has been written about the problems associated with "teaching to the test" and how this can reduce the scope of the curriculum taught in classrooms. There is also the issue of "pay for performance" among teachers and schools as well as questions as to the usefulness of assessment results in improving learning. These are just some of the sources of concern among stakeholders, especially teachers: some feel threatened while others maintain that the data are not fully used.

Resistance usually arises around initiatives that could potentially alter the status quo within countries or how they are compared internationally. It is therefore essential to properly recognise and address the cultural and local contexts surrounding assessment while mapping the potential "winners" and "losers" to take a proactive approach to resolving potential sources of conflict.

The political context of measurement means that countries will choose different paths. Some may choose to participate in global assessments, while others may develop national assessments first but decide later to use a global metric for their assessments. In the end, the overarching goal of SDG measurement is to encourage the collection and use of data on children's learning to improve policies and practices. It is therefore essential to find a politically-feasible approach towards resolving the technical issues highlighted in the following discussion of key indicators by target.

## TARGET 4.1: MEASURING READING AND MATHEMATICS IN BASIC EDUCATION

Target 4.1 covers the quality of primary and lower secondary education. The key concepts to measure include quality of education and learning in two subject areas in early and late primary education and at the end of lower secondary education. The current global indicator for this target is the "proportion of children and young people: (i) in Grade 2 or 3; (ii) at the end of primary education; and (iii) at the end of lower secondary education who achieved at least a minimum proficiency level in (a) reading and (b) mathematics".

**Table 9. Some examples of major sources of differences in national learning assessments**

| | |
|---|---|
| **Content framework** | ▪ Assessments vary in terms of content coverage for the assessed grade<br>▪ Definitions of domains differ |
| **Type of items and assessment format** | ▪ Assessment formats differ across national assessments<br>▪ Some national assessments use:<br>  ▪ only multiple-choice items<br>  ▪ a combination of multiple-choice, and short or long response items<br>  ▪ performance assessment, such as oral or portfolio assessment |
| **Target population** | ▪ Assessments can be conducted in different grades<br>▪ Some countries assess:<br>  ▪ in the middle of an education level<br>  ▪ at the end of an education level<br>  ▪ in both the middle and at the end of education levels<br>▪ The duration of schooling may vary by country |
| **Data modelling and reporting** | ▪ Some countries use sophisticated statistical models, like item response theory to scale and report scores<br>▪ Others use simple descriptive statistics, like the proportion of correct scores<br>▪ Thus, the reporting scores differ in scale or metrics |
| **Contextual information** | ▪ Contextual information is usually collected during national or cross-national assessments through in-school assessments or household surveys<br>▪ The information collected varies, but data often include some relevant disaggregation variables: age, sex, grade, location and socio-economic background; disability status collected less often |
| **Technology** | ▪ Using computers or tablets as the assessment platform streamlines the operational process. This also improves the efficiency of data processing<br>▪ Technology also allows the use of authentic cognitive items, such as simulation, to put items into a more realistic context<br>▪ There are costs associated with the development of assessment tools. Therefore, it is important to prioritise and budget the development cost accordingly |

*Source: UNESCO Institute for Statistics*

### *How has reading and mathematics in basic education been measured to date?*

Large-scale assessments can be divided into two categories: school-based or household surveys (*see* ***Figure 14***). School-based assessments include two types:

- national assessments designed to measure specific learning outcomes at a particular age or grade that are considered relevant for national policymakers; and
- cross-national initiatives (either regional or international) administered in a number of countries, based on a commonly agreed framework, following similar procedures yielding comparable data on learning outcomes.

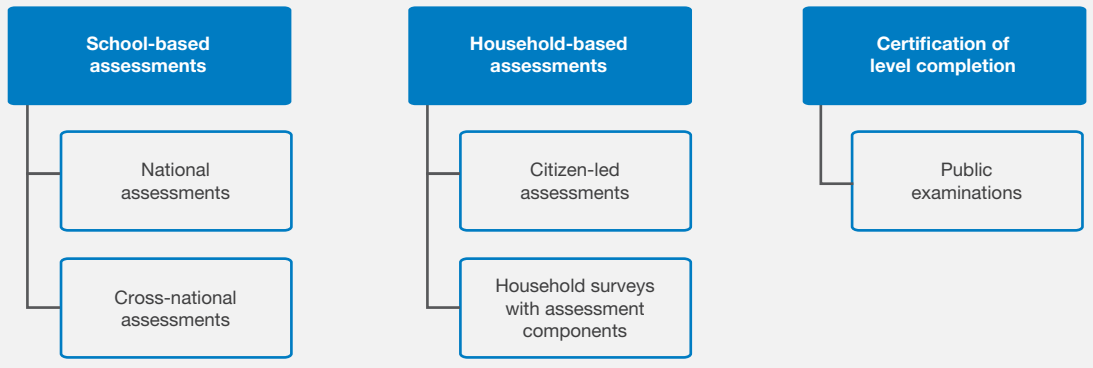
Household-based learning assessments can be used to target populations that may or may not be enrolled in or attend school. They include citizen-led assessments and any household surveys that include an assessment component in their data collection.

Both household-based surveys and school-based assessments collect background information that put the data in context. By covering children and young people in school and out, household-based surveys provide information on households and enabling environments. School-based assessments provide system-level information on the classroom and school environment. Together, school-based assessment and household-based learning assessment help to provide a snapshot of how children and youth around the world are learning. However, the results from these different types of assessments cannot be compared internationally.

Public examinations are high-stakes exams that apply to all individuals. They serve to select students for continuing education programmes or certify attainment of a certain qualification.

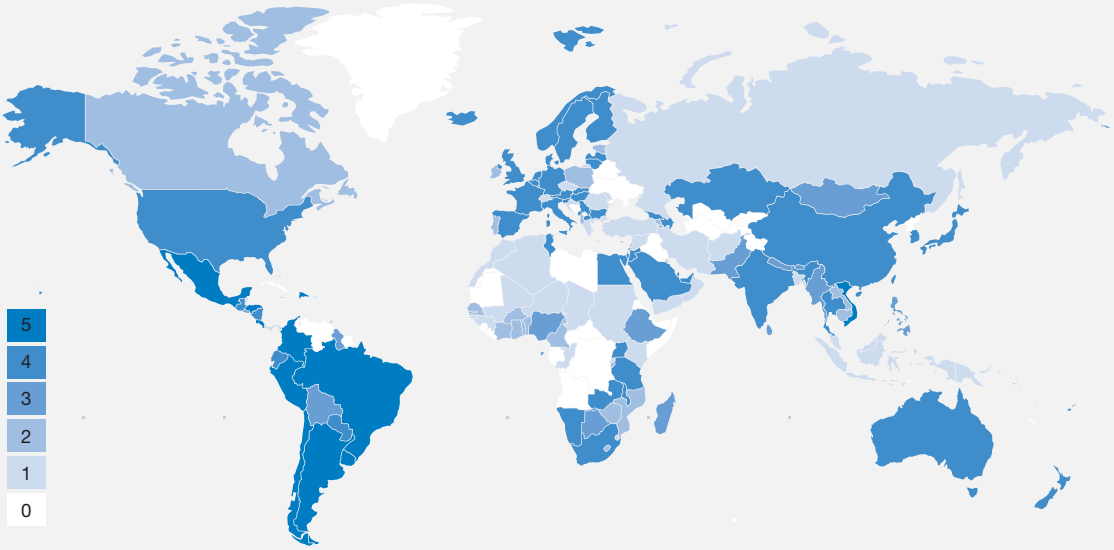
In terms of subjects assessed, reading and mathematics are the most common areas of study. According to UIS estimates, 80% of countries have conducted a national learning assessment or participated in a cross-national initiative in the last five years *(see* ***Figure 15****).* This represents

**Figure 14. Types of assessments and public examinations**




*Source: UNESCO Institute for Statistics*

**Figure 15. Learning assessment capacity index, measuring assessment frequency in the last five years**




*Source: UNESCO Institute for Statistics*

a significant increase in the number of student assessments undertaken globally over the past decade and is due in part to the growing number of regional assessments during this period. However, due to differences in the measurement constructs and frameworks, these assessments are not always comparable across countries and there are many technical challenges remaining. Thus, it is difficult at this stage to compare countries in terms of learning achievement.

### *Key challenges for the measurement of reading and mathematics in basic education*

One of the main challenges for measurement on the global level relates to standard-setting given the differences in context. This means deciding what counts as meeting a 'minimum competence' level in different national contexts, and generating tools to describe the level of competency. Other challenges related to the process of establishing minimum competence include mapping diverse content domain coverage; developing a relevant learning scale, streamlining varied data quality, establishing a coherent reporting metric, and building country capacity to produce needed data and managing financial and human resource allocation. Summarising, the key questions to ask are:

- How can the content to be evaluated be defined when it is used to align and map varied and diverse national and cross-national assessments?
- How can contextual information be identified in the collection of background questionnaires?
- How can the minimum levels of competence and performance levels be defined?
- How can heterogeneity in data collection and processing be reduced?
- How can the best method of reporting be defined?
- What wide-range learning scale can be used for diverse levels of learning and for mapping skills?

- How can a global reporting metric be established that includes proficiency levels and related benchmarks for aligning reporting?
- What kinds of guidelines are needed for data analysis and policymaking?
- Who should be assessed—children and youth in school and out? And how? How often should the data be collected and how can we harmonise information from school-based and household-based assessments? What are the costs of data collection? And what is the acceptable level of error and bias in reporting?

## TARGET 4.2: MEASURING EARLY CHILDHOOD DEVELOPMENT

Target 4.2 focuses on early childhood development (ECD), care and pre-primary education in terms of quality and participation. It therefore presents a good example of a target that can be measured using administrative and other sources of information.

The current global indicator for this goal is the "percentage of children under 5 years of age who are developmentally on track in health, learning and psychosocial well-being". Key concepts to measure include quality of care and education, access to programmes, and child development and learning at the start of school. Measuring early childhood development is complicated but possible with sufficient technical consultation and operational support to countries in order to generate reliable data.

The idea of using one globally-comparable approach to measure ECD in all countries, rather than focusing on a region or grouping of countries (such as high- or low-income), is new. It is nonetheless informed by a long history of ECD measurement. The literature shows that for decades researchers and clinicians in a range of countries have developed and been using measures of ECD based on psychometric properties. Typically these standardised scales were tied to norms for use in high-income countries.

### *How has ECD been measured to date?*

In recent years, attention has focused on development of regionally- or globally-comparable population-based measures of ECD. Many of the items and constructs previously documented are now used to generate population-based estimates, and there are considerable points of commonality. Several measures are now used across more than one country and at the population level *(see **Table 10**)*. All the tools listed are designed to capture children's development in the late preschool years using a combination of mathematics, literacy, language, social/emotional and motor development items.

There are advantages and disadvantages for each type of tool. Direct assessment is sometimes considered to be the most objective way to capture information on children's development. In many cases, this type of assessment may not be feasible unless it is carried out within a household survey and may not be capable of capturing many aspects of social/emotional development. Parents may not be accurate in reporting on specific details of their children's development as direct observers, even though they have the most depth and breadth of knowledge and therefore offer different information from that captured by other forms of direct assessment. Teachers are good reporters of children's behaviour in schools and therefore may be well-suited to predict which children will succeed over time, but only if they have the chance to get to know each child individually.

### *Key challenges to measuring ECD*

The challenge now is to create a workable global strategy for ECD measurement that balances the need for globally-comparable data with national relevance, while adequately handling the complexity

**Table 10. Some tools used to measure ECD**

| Tool | Region | Purpose | Method of administration |
|---|---|---|---|
| **Early Development Instrument (McMaster University)** | Originally developed in Canada; has been adapted and used in representative samples in other countries | Population-level measurement of children's development for 4- to 6-year-olds | Teacher report |
| **East Asia Pacific Child Development Scales (UNICEF)** | East Asia region; used in representative samples in 9 countries to date | National level and regionally-comparable data on the development of children aged 3 to 5 years | Direct assessment; short form of scale now developed and ready for use |
| **IDELA (Save the Children)** | Global tool; used in at least 30 countries | Programme and national-level data on children's development between 3 and 6 years | Direct assessment |
| **MICS Early Child Development Index (UNICEF)** | Global tool; used in representative samples in at least 50 countries | Globally-comparable and national-level data on the development of children aged 36 to 59 months | Parent report through household survey |
| **Measuring Early Learning and Quality Outcomes (MELQO) (Brookings Institution, UNESCO, UNICEF, World Bank)** | Designed for use as a global "core" to integrate into existing tools and national-level assessments | Globally-comparable and national-level data on children's development between 4 and 6 years | Direct assessment, teacher or parent survey |
| **PRIDI (Inter-American Development Bank)** | Latin America region; used in 4 countries | Regional and national-level data on early childhood development and household contexts | Direct assessment; parent survey |
| **West and Central Africa Regional Office Regional Prototype (UNICEF)** | West Africa; used in representative samples in 8 countries | National-level and regionally-comparable data on children's development in the first year of school (6-year-olds) | Direct assessment of children through groups and individual assessment in schools |

*Source: UNESCO Institute for Statistics, concept note by Raikes, 2016*

of cultural and contextual influences on child development.

The MICS Early Childhood Development Index (ECDI) has been identified as the primary indicator of Target 4.2 for global monitoring and has been used in several low- and middle-income countries to date. Many national governments and regional entities are also investing in ECD measurement. Reliance on one tool may be most efficient for global monitoring purposes but will also require additional development to ensure that it is useful across all countries. The specific questions to answer include:

- What does "developmentally on track" mean in diverse contexts, beginning at birth and extending through the early childhood years?
- Is it possible to generate options for global measurement, including technical solutions

for integrating national and regional data into global monitoring, and provide opportunities for sharing information among those designing and implementing ECD assessments?

- How critical is it to have directly comparable data on ECD, and at what cost, conceptually and practically?

- How can we engage high-income countries in the dialogue? Integrating data from multiple existing sources may provide a greater degree of cultural relevance and has the added advantage of potentially being able to integrate data on health and nutrition.

- How can we ensure- cultural and contextual alignment of constructs?

## TARGET 4.4: MEASURING ICT SKILLS

Target 4.4 reads: "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." The global indicator is based on the percentage of individuals with ICT skills by type of skill. It measures ICT skills based on the number of people who report to have undertaken certain computer-related activities in a given time period (usually during the last twelve months in the case of Eurostat, or three months in the case of the International Telecommunications Union—ITU). The methodology was developed by Eurostat, which collects data for 32 countries, and adopted by the ITU, which collects data annually for all remaining countries. However, only 8 additional countries reported data for 2014.

The current context of global development is characterised by acceleration in the development, complexity and use of ICTs. Among the challenges are access to ICTs (the first digital gap) and ensuring people have the skills to use ICT (the second digital gap).

According to the Education 2030 Framework for Action, two indicators are considered: indicator 16.1 "Percentage of youth/adults who have achieved at least a minimum level of proficiency in digital literacy skills" (considered as the priority indicator by the TAG); and indicator 16.2 "Percentage of youth/adults with information and communications technology (ICT)". 16.2 is the current global indicator, while 16.1 can be considered the alternative indicator.

The global indicator is usually derived from a national ICT survey that typically asks a number of questions on access to various devices and the Internet within the household, and then asks one or more randomly selected individuals from the household to answer questions on ICT usage, which include skills.

### *How have ICT skills been measured to date?*

The national data are gathered through international surveys conducted, for example, by the ITU. At the global level, the ITU collects information on the following computer-related activities to measure ICT skills: basic ICT tasks such as copying or moving a file or folder; managing documents, such as sending e-mails with attached files; using basic arithmetic formulae in a spreadsheet; connecting and installing new devices such as a modem, camera or printer; finding, downloading, installing and configuring software; creating electronic presentations, including text, images, sound, video or charts; transferring files between a computer and other devices; and writing a computer program using a specialised programming language.

**Table 11** presents a summary of other cross-national initiatives to measure ICT skills led by different organizations.

**Table 11. Efforts to measure ICT skills**

| Programme | Years and frequency | Participating countries | Target population | Instruments | Constructs measured |
|---|---|---|---|---|---|
| ITU's Measuring ICT Access and Use by Households and Individuals | Annual survey since 2004 | 193 ITU Member States worldwide | 5-year-olds and older in households | ▪ household survey<br>▪ self-reporting on skills | Access to and use of ICTs and Internet and other electronic networks |
| OECD Programme for International Student Assessment (PISA) | Every 3 years since 2000 | 34 OECD Member States and 31 partner countries | 15-year-old students | ▪ direct assessment of student skills<br>▪ teacher questionnaire<br>▪ principal questionnaire | ICT use, interest in ICT, perceived ICT competence; perceived autonomy using ICT, ICT use in social interactions, computer availability in schools, and policies fostering computer use |
| International Association for the Evaluation of Educational Achievement (IEA) International Computer and Information Literacy Study (ICILS) | 2013; 2018 | 20 countries (or territories) across Asia, Europe, North America, and South America | Grade 8 (or its national equivalent) students | ▪ direct assessment of student skills<br>▪ student questionnaire<br>▪ teacher questionnaire<br>▪ school questionnaire<br>▪ national context survey | Two strands that frame skills and knowledge: (a) collecting and managing information, and (b) producing and exchanging information |
| Eurostat Survey on ICT usage in households and by individuals | Annual survey since 2002 | 28 Member States of the European Union | ▪ all individuals aged 16-74;<br>▪ all households with at least one member aged 16-74 | ▪ household survey | Access to and use of ICTs and Internet and other electronic networks by individuals and/or in households |
| OECD Programme for the International Assessment of Adult Competencies (PIAAC) | Round 1 in 2008-13; Round 2 in 2012-16, Round 3 in 2014-18 | 23 OECD Member States and 1 partner country | Adults aged 16-65 | ▪ direct assessment of adult skills<br>▪ background questionnaires | Ability to solve problems in technology-rich environments |

*Sources: Eurostat survey on ICT usage in households and by individuals (http://ec.europa.eu/eurostat/statistics-explained); IEA International Computer and Information Literacy Study (ICILS) (http://www.iea.nl/icils_2013.html); ITU Manual for Measuring ICT Access and Use by Households and Individuals (http://www.itu.int/en/ITU-D/Statistics/Pages/publications/manual2014.aspx); OECD About PISA (https://www.oecd.org/pisa/aboutpisa/) and About PIAAC (http://www.oecd.org/skills/piaac/surveyofadultskills.htm)*

### *Key challenges to measuring digital skills*

One of the main problems with the global indicator is that it is self-reported. Those surveyed provide information on the types of activities they had undertaken but not their proficiency level. Furthermore, it is impossible to verify the veracity of these self-assessments, and more importantly, there can be large differences in reporting between groups of different cultural and personal backgrounds. For example, it is well know that women tend to under-report their abilities in using computers and the Internet, while men tend to overstate their abilities. It is also very likely that someone from, say, Finland, approaches the question differently than somebody from Ethiopia.

In terms of population coverage the target for youths and adults stresses the fact that young people specifically should be included in the measurement. Context is relevant and may be vastly different from one country to the next. Children in high-income countries may develop skills years ahead of those in low-income countries.

Questions that address the challenges that can be identified in developing a 4.4 measurement strategy include:

- What concept should be measured and how should it be defined? What do we mean by ICT skills or digital literacy? Should there be a consideration of technical and vocational skills as well?
- What measurement tool needs to be developed and how? Do we need different tools for different age groups (in particular for young people)?
- Should measures be equally appropriate for children in all countries, and if so, how can such scales be created?
- How will it be distributed to countries? How can countries be supported to implement the new tool?
- What is the cost of implementing the tool?
- How can we set baselines?
- With what frequency should countries measure and report?
- Consideration should also be given to the process of inserting the new indicator into the global list. Is this possible at all? If so, when and how?

## TARGET 4.6: MEASURING ADULT LITERACY AND SKILLS

Target 4.6 covers adult literacy and numeracy. The current global indicator for this goal is the "Percentage of population in a given age group achieving at least a fixed level of proficiency in functional (a) literacy and (b) numeracy skills". Key concepts to measure include proficiency in literacy and numeracy.

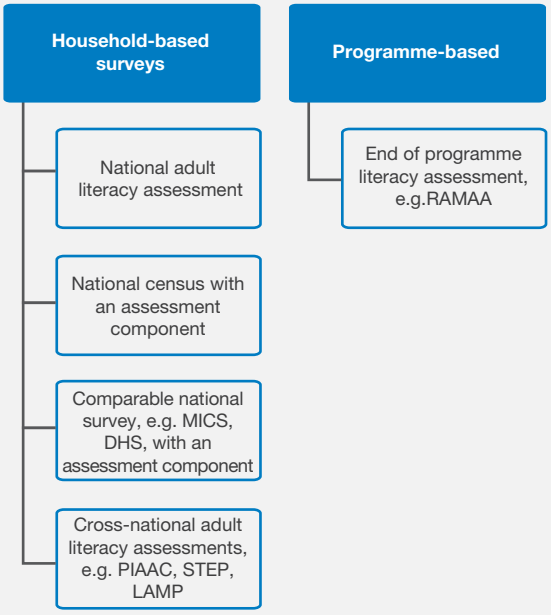
### *How have youth and adult skills been measured to date?*

In the area of adult literacy, large-scale, international adult assessment programmes—such as the International Adult Literacy Survey (IALS), the Adult Literacy and Life skills (ALL) survey, the PIAAC and the Skills Toward Employment and Productivity (STEP) study—allow countries to compare the skills of their adult population and gain insight into what needs to be improved to have a skilled and productive population. On the other hand, countries also collect data on adult literacy skills in surveys that are nationally designed and therefore vary in content coverage and methodology. Furthermore, the quality and reliability of the assessments, and thus the reported scores, may vary widely. As a result, it is difficult to compare national-level adult literacy skills with data from the various assessments. The types

of collection tools currently in use are summarised in **Figure 16**.

These assessment programmes listed in **Table 12** are technically rigorous and respected, with many countries participating. However, they are typically implemented in countries at a higher level of development and therefore assess higher-level skills and have fewer tasks to measure populations with low skills. Some of the assessment tasks are highly demanding and focus on problem-solving in an enriched literacy environment, which may not reflect the reality of large segments of the population of less-developed countries, where average literacy skills are often significantly lower and many adults lack basic reading and writing skills. Assessments like the Survey of Adult Skills conducted as part of PIAAC are not as relevant for less-developed countries because they could not identify literacy among low-skilled segments of the population and thus would provide relatively little guidance as to what skills need to be improved and how.

**Figure 16. Types of adult literacy assessments**




*Source: UNESCO Institute for Statistics*

DHS and MICS surveys try to address the dearth of literacy assessments in developing countries by adding a simple test of reading skills to their survey modules. In DHS and MICS surveys, a sample of adult respondents, typically women and men between 15 and 49 years, are asked to read a card with a short, simple sentence in their language. The result is recorded as one of three options: i) cannot read

**Table 12. Country participants in major international skills assessments by region**

| Region | LAMP | PIAAC | STEP | RAMAA | Total |
|---|---|---|---|---|---|
| East Asia and the Pacific | 3 | 6 | 3 | | 16 |
| Europe and Central Asia | | 22 | 6 | | 49 |
| Latin America and the Caribbean | 2 | 1 | 2 | | 7 |
| Middle East and North Africa | 3 | 1 | | 1 | 5 |
| North America | | 2 | | | 7 |
| South Asia | 1 | | 1 | | 3 |
| Sub-Saharan Africa | 2 | | 2 | 4 | 9 |
| **Total** | **11** | **32** | **14** | **5** | **96** |

*Source: UNESCO Institute for Statistics*

at all; ii) able to read only parts of the sentence; or iii) able to read the whole sentence. The results of these tests are available for nearly all DHS and MICS surveys carried out in the last decade, including a large number of surveys in less-developed countries. The test results are more reliable than self-reported data on literacy and give at least some sense of the level of reading skills. On the other hand, these simple reading tests do not allow the measurement of literacy on a continuum, unlike the assessments mentioned earlier and are therefore only a partial improvement on traditional dichotomous literacy indicators.

### *Key challenges to measuring adult skills in reading and mathematics*

Currently, the UIS is working with the UNESCO Institute for Lifelong Learning (UIL), the OECD and the World Bank on a collaborative effort to design and produce a basic adult literacy assessment survey, the Short Literacy Survey (SLS). It will provide information on individuals' acquisition of very basic reading skills and will attempt to link to other international assessments scales, like PIAAC and STEP. Once the three assessments are linked, it will be possible to produce a wide set of comparable data for initial monitoring of adult skills. However, there is one major limitation in the new SLS. The survey assesses literacy and, based on past research, assumes that there is a high correlation between literacy and numeracy and uses this relationship to estimate assessed adults' numeracy skills.

Both the UN General Assembly and the UNESCO General Conference have expressed concern about the unfinished literacy agenda. In response, the UIL has established the Global Alliance for Literacy (GAL) to bring together all stakeholders involved in the quality assurance of national adult learning assessment data. Since the measurement of skills in adults is part of SDG Target 4.6, the work of the GAL is also articulated within the broader coordination mechanism for Education 2030.

## TARGET 4.7: MEASURING GLOBAL CITIZENSHIP EDUCATION

Target 4.7, which includes global citizenship education (GCED) and education for sustainable development (ESD), aims to address the two most pressing and overarching requirements of global society for its schooling systems: both "living together" (respect for human rights, social justice, diversity, gender equality) and the "relationship with nature", under conditions of unprecedented pressure and risks.

GCED and ESD are seen as critical avenues for a sustainable and peaceful future for all since they are believed to have a key transformative potential. They seek to equip learners of all ages with values, knowledge and skills that are based on and instil respect for human rights, social justice, diversity, gender equality and environmental sustainability and that empower learners to be proactive and responsible global citizens.

The global indicator for Target 4.7 measures the quantity and quality of country inputs towards GCED and ESD. It is intended to reflect national commitment in these areas (for example, whether the political will/decisions and resources available have been translated into concrete policies, curricula or assessments). It can also help to predict the likelihood that desired student outcomes will be achieved.

### *How GCED has been measured to date*

The 1974 UNESCO Recommendation concerning Education for International Understanding, Co-operation and Peace and Education relating to Human Rights and Fundamental Freedoms contains a reporting mechanism. The document recommends "taking whatever legislative or other steps" that provide institutional and pedagogical support for its guiding principles such as: education for human rights, peace and non-violence, cultural diversity,

human survival and well-being, caring for our planet. These are compatible with the concepts contained in Target 4.7.

According to the Recommendation, Member States are supposed to report every four years. So far, UNESCO has conducted five reporting cycles on its implementation, with a sixth cycle being launched with the inclusion of a questionnaire relevant to the Target 4.7 indicator. UNESCO is studying the extent to which ESD and GCED are mainstreamed in: (i) national education policy; (ii) curricula; (iii) teacher education: (iv) student assessments; and (v) countries where "sustainable development", "global understanding" or an "international understanding" policy, plan and/or law is in place. This reporting could constitute a baseline.

A possible source of data for this indicator is an enhanced version of the IEA's International Civic and Citizenship Education Study (ICCS). Following an agreement with UNESCO, the ICCS survey tools will be revised for alignment with Target 4.7and data from the 2016 ICCS cycle will be reviewed for relevant information regarding Target 4.7.

While new tools and methods are being developed, information is available from ICCS 2009 results which show different levels of student knowledge and engagement (*see* ***Figure 17***). ICCS consequently structured its framework and approach beyond just the level of learners, that is, around notions related to civics and citizenship as well as context. In the ICCS civics and citizenship framework, cognition, socio-emotional and behavioural notions and aspects were structured along with the corresponding processes. Levels are drawn from students' engagement with basic principles and broad concepts that underpin civics and citizenship to a higher level where students demonstrate a holistic rather than a segmented knowledge and understanding of civic and citizenship concepts.

Efforts to further develop the conceptual frameworks underlying these indicators are already underway. For example, for the thematic indicator *Percentage of students by age group (or education level) showing adequate understanding of issues relating to global citizenship and sustainability*, which represents a direct measure of the learning outcomes achieved in global citizenship education and education for sustainable development, a possible source of data is an enhanced version of the IEA's ICCS.

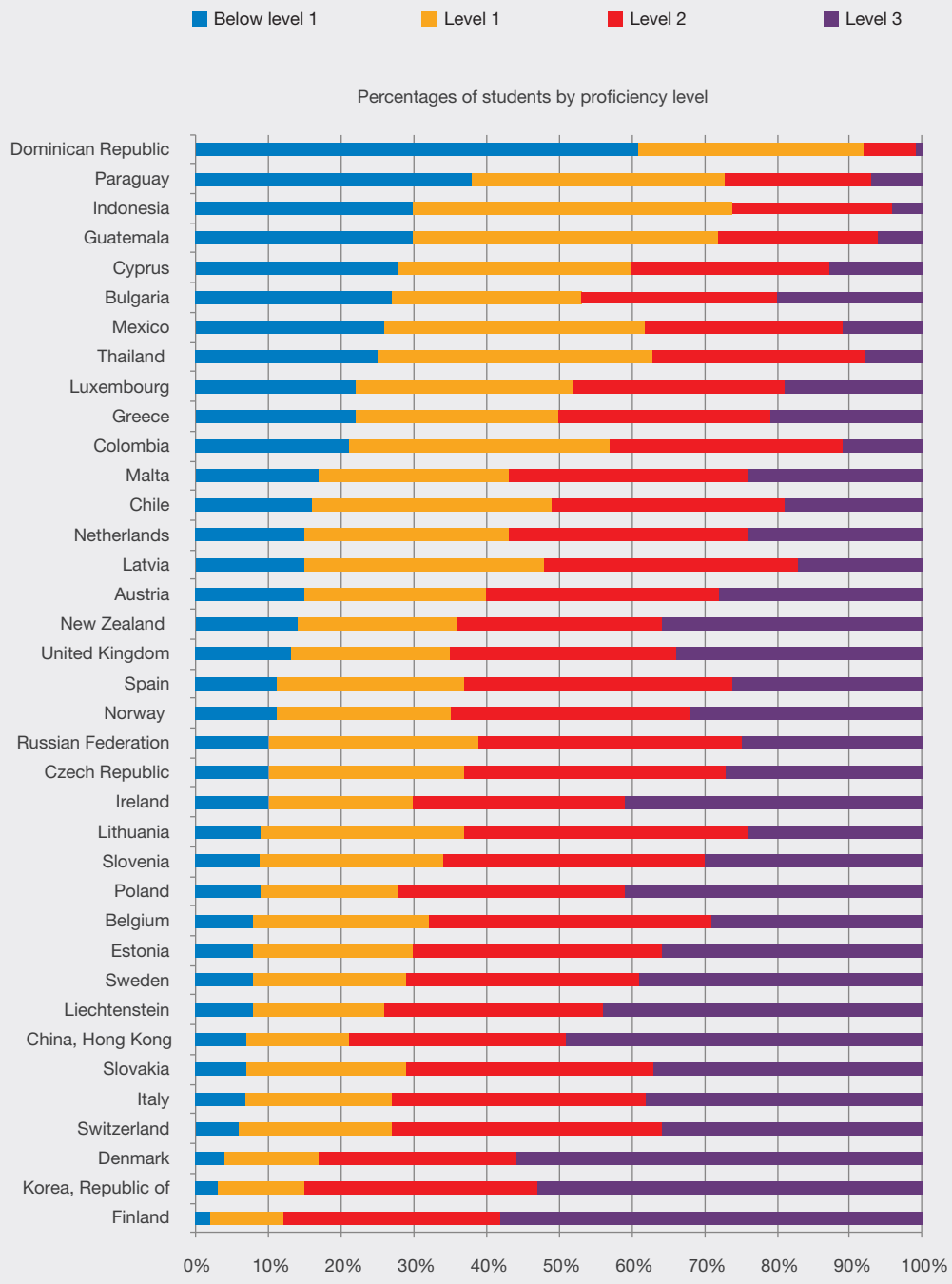
Following an agreement with UNESCO, the ICCS survey tools will be revised for alignment with Target 4.7. In addition, data from the 2016 ICCS cycle will be reviewed for relevant information to help track progress. For the thematic Indicator on the *percentage of 15-year-old students showing proficiency in knowledge of environmental science and geoscience*, which is typically collected via skills assessment surveys, a possible source is OECD's PISA but other sources are also being explored. For the thematic indicator *Extent to which the framework on the World Programme on Human Rights Education is implemented nationally (as per UNGA Resolution 59/113)*, national evaluation reports and other evaluations of the implementation of the action plan for each stage of the World Programme on Human Rights Education are submitted periodically to the Office of the High Commissioner for Human Rights (OHCHR).

### *Key challenges to measuring GCED*

To identify the set of potential indicators we must answer the following questions:

- How is GCED and ESD defined in terms of the needs of the 2030 Agenda?
- What dimensions should be included (e.g. cognitive, socio-emotional, behavioural)?

**Figure 17. Distribution of students by proficiency level in civic and country knowledge, 2009 (%)**




*Source: UNESCO Institute for Statistics, based on data from IEA, 2010*

- How can we separate learners' attributes from learning outcomes?
- Which dimensions should be measured (e.g. community, institutions and classroom, home, learner)?
- What contexts should be measured? Only where policymakers can affect change?
- Which are the appropriate age groups or cohorts to measure? By level of schooling?
- What mechanisms could be used to collect data for different populations (e.g. students and out-of-school children and youth)?
- What data sources can be used to produce the indicators?

## 4.2 TOWARDS A WORKABLE STRATEGY TO MEASURE LEARNING AND SKILLS

The guiding principles for advancing the learning measurement agenda include: supporting and balancing multiple viewpoints while identifying globally-relevant areas of learning; conceptualising how national and regional data can help inform global education measurement; striking a balance between defining "global" competences and the role of local contexts and national education goals. The Global Alliance to Monitor Learning (GAML) is designed to support these objectives in combination with a number of other UIS initiatives in this area (*see **Box 21***).

GAML brings together national and international education stakeholders to foster a participatory process for measurement. This is essential to enhance and leverage national learning assessments, and ensure the implementation of policies to ascertain

### Box 21. UIS efforts to advance the agenda for the measurement of global learning

The Learning Metric Partnership (LMP) is a joint initiative of the UIS and the Australian Council for Educational Research's Centre for Global Education Monitoring (ACER-GEM) to develop a set of nationally- and internationally-comparable learning metrics in mathematics and reading, and to facilitate and support their use for monitoring purposes in partnership with interested countries.

- The *UIS Catalogue and Database of Learning Assessments* was launched in 2015, and the next version with global coverage will be released at the end of 2016. It is the only global repository of metadata on learning assessments, providing information on large-scale assessments in primary and lower secondary education, including public examinations and national learning assessments. It covers 168 assessments from 68 countries and includes 80 narrative summaries on public examinations, national learning assessments, cross-national initiatives and citizen-led assessments. A new version of the Catalogue will provide targeted information (e.g. funding sources, use of data and a country's performance level) on learning assessments. The database will be used to produce SDG 4/Education 2030 indicators to monitor progress while learning scales and global reporting metrics are being developed.
- The ebook *Understanding What Works in Oral Reading Assessments* (UIS, 2016) represents a collection of experiences from 50 authors and 30 organizations that addresses implementation, outlines technical and policy issues related to oral reading assessment and provides recommendations for measuring early reading skills.
- The *Learning Assessment Capacity Index (LACI)* documents the prevalence of assessments globally. The LACI database covers more than 100 countries and is being extended to include learning assessments beyond primary and lower secondary education.

*Source: UNESCO Institute for Statistics*

good learning outcomes. It also serves to secure adequate external funding for the international reporting of quality assured national learning assessment data.

In particular, GAML will address the following key questions (as illustrated in **Figure 18**):

1. What should be measured? For example, in the domains of content and skills/competencies of learning there is a need for a common content framework for reference (including contextualised background information).

2. How should we measure? Consider the use of different types of assessment to collect relevant data, as well as use of new technology in data collection. Data should be skills-based or curriculum-based , age-based or grade-based.

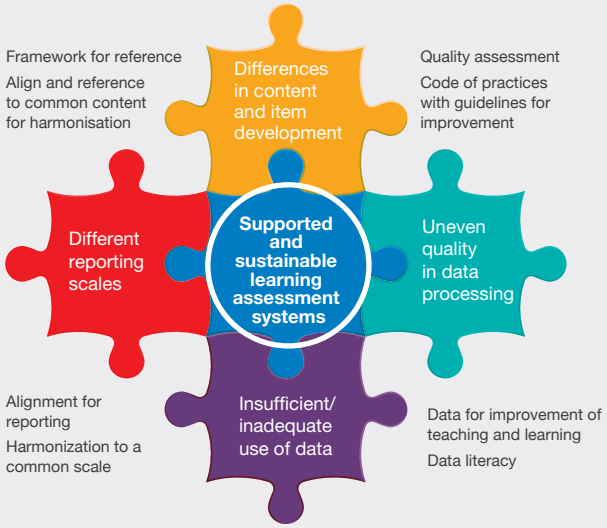
3. How can we ensure the quality of data processes and the standardisation of data collection, processing and reporting? Good learning assessments data demonstrate the need for a quality assurance process.

4. How can we ensure the proper use of results by all stakeholders to develop policy? This is particularly important for literacy data.

5. How should we report at the global level? There should be a definition for the standard on minimum competences and the performance level for each indicator should be established. This is particularly important for the minimum level of competency.

A feasible strategy should include three main pillars: first, conceptualising and building a global framework for reference to facilitate global measurement and reporting of learning; second, establishing an international code of practice to guide the development and implementation of robust, reliable assessments; and third, ensure sustainability through clear governance, coordination of funding by key stakeholders and political and technical leadership to provide input and guidance throughout the process.

**Figure 18. Solving the learning assessment puzzle**




*Source: UNESCO Institute for Statistics*

### *A global framework for reference and a reporting metric*

A framework provides a common basis when elaborating a subject/learning domain, assessment, and measurement mechanism. For global usage, the framework must be comprehensive, transparent, and coherent[1] and follow good practice (*see* ***Box 22***).

When fully developed, this framework and its respective scale will cover the complete range of content domains and could then be used to outline the progression of learning competencies. This lays

1 Some principles of the common framework used here were adapted from the "Common European Framework of Reference for Languages: Learning, Teaching, Assessment", Language Policy Unit, Council of Europe, Strasbourg. The article is available at: www.coe.int/lang-CEFR

## Box 22. Ensuring quality: an international code of practice for learning assessments

The coordination of learning assessments should be driven by a commonly accepted set of rules with an associated assessment mechanism that ensures accountability. Observance of a common code of practice by all stakeholders involved in the implementation of initiatives will foster a more coherent and effective approach.

A code of practice will not guarantee data quality and availability, but adherence to it will contribute to making systems more efficient and cost-effective. It could serve as a self-regulatory instrument for data producers and a regulatory instrument for the sponsors of assessments. National agencies (as well as regional or international agencies that manage survey programmes) can also use the code to guide their assessment practices and present the results in a standard format. They can also be used by countries to develop their own recommendations and guide their survey efforts in the future.

A second step is the evaluation through a data quality assessment framework that consists of a set of tools and mechanisms to evaluate the quality of learning assessment methodologies and data. The data quality assurance framework (DQAF) provides a structure for assessing existing practices against best practice (set by a code of practices). This is valuable for at least three groups of users:

- It will guide UIS staff on the reporting of data and designing guidelines for technical assistance.
- It will guide country efforts, such as in the preparation of self-assessments.
- It will guide data users in evaluating data for policy analysis, forecasts and economic performance.

The DQAF will follow 3 to 5 dimensions of data quality: assurances of integrity, methodological soundness, accuracy and reliability, serviceability and accessibility.

*Source: UNESCO Institute for Statistics*

the basis for an internationally-agreed, common reference point for the measurement of learning. Furthermore, the learning scale could be used as a point of reference for national assessments, which would facilitate a common understanding of key steps in learning. While countries rely on their own standards and methodologies to build national assessments, the framework would ensure data are within the parameters to ensure comparability. The primary goal of this framework and its respective scale is to promote reliability and comparability of national, regional and cross-national assessments, while simultaneously helping to inform global monitoring and build on current initiatives.

Once a progression of learning competencies is established, constructs defined in each domain and items in different assessments could be mapped according to content and skills measured (including difficulty levels). **Table 13** illustrates how this mapping can be used to define comparability of a particular assessment.

The reporting metric is a by-product of the learning scale. In simple terms, it can be seen as a measurement stick for reporting. For example, in SDG 4, countries will be reporting the percentage of children, young people or adults who achieve minimum competencies in key learning domains. One of the first steps lies in reaching consensus within the international education community on what it means to achieve

**Table 13. Example of multiple-choice items from national and cross-national assessments**

| Contents/construct | Country A | Country B | CNA1 | CNA2 (regional) |
|---|---|---|---|---|
| Geometry 3rd grade | Item 8, 12, 14, 17 | Item 3, 7, 8, 12 | Items 12, 25, 26, 28 | Items 4-9 |

*Source: UNESCO Institute for Statistics*

minimum competencies. This definition will guide the development of a benchmark or cut-score for the reporting metric. The cut-score will divide the assessed population into two groups: those who have achieved minimum competencies and those who have not.

### *How to improve data use and dissemination of learning assessment results*

The ultimate goal of assessing learning is clear: to improve the quality of education received by all children, no matter what circumstances they live in or the socio-economic status of their households, communities or schools. Assessments must provide all stakeholders—from ministers to teachers, parents and students—with the specific information they need to improve learning outcomes.

A teacher, for example, will need different types of information to improve the classroom environment than a minister responsible for a national education system. Alternatively, both may use the same results but for different purposes. It is therefore essential to strengthen national capacities to make full use of the information and provide an accurate interpretation of the results.

This also implies concerted efforts to broadly disseminate assessment results. Far too often, access to information is erroneously reduced to the publishing of league tables in the media. This score-card approach, either within countries or between them, does little more than inform some parents or communities that their children are at a disadvantage without providing any insight into how the results might reflect differences in their socio-economic status. Perhaps most importantly, it does not inform the families about the skills that their children are missing.

Nevertheless, some countries (generally with middle or high incomes) are finding innovative ways to use and disseminate the data. Evaluation is no longer considered a simple practice or exercise but a continuous process of re-thinking policies and learning from previous experience while changing the orientation of programmes and resources to improve learning outcomes and the general health of the education system. In short, the stakeholders are using the results to learn how to bring about positive change.

At both the international and national levels, it is therefore essential to re-think the ways in which learning assessment data are disseminated and for what purposes. By identifying good practices and possible templates, it is possible to support countries in preparing analysis for different types of users—from policymakers to teachers looking to reinforce their pedagogical approaches and parents trying to help their children learn. Currently, the data are used to assess and manage education systems yet they also provide a rich source of information to directly address the needs of students. The challenge lies in making the data widely accessible and usable by different actors.

## 4.3 MEASURING EQUITY: A MAJOR CHALLENGE FOR THE NEW DEVELOPMENT AGENDA

Equity is one of the most prominent features of the new international agenda. This term broadly refers to different concepts related to fairness and compensatory actions that recognise disadvantage.

SDG 5 and SDG 10 specifically call for gender equality and the overall reduction of inequalities within and among countries, while equity issues are also highlighted in most of the remaining goals. SDG 4 is no exception, with Target 4.5 explicitly calling for monitoring through the use of parity indices and the disaggregation of all education indicators to the extent possible. This is a new set of challenges for countries and the international community, which must go beyond traditional models of producing education data.

The parity index is the key indicator that will be used for global monitoring across all disaggregated indicators. As a result, equity-related indicators account for the largest share of the data needed to monitor SDG 4 as a whole. Many of the 43 indicators in the thematic framework will have to be disaggregated by sex, location and wealth in order to calculate the parity indices needed to monitor Target 4.5. But, as shown in Section 2, many countries currently fall short of being able to respond to this demand.

In addition to the parity indices, three policy indicators are part of the thematic indicator framework for Target 4.5:

- percentage of students in primary education whose first or home language is the language of instruction;
- extent to which explicit formula-based policies reallocate education resources to disadvantaged populations; and
- education expenditure per student by level of education and source of funding.

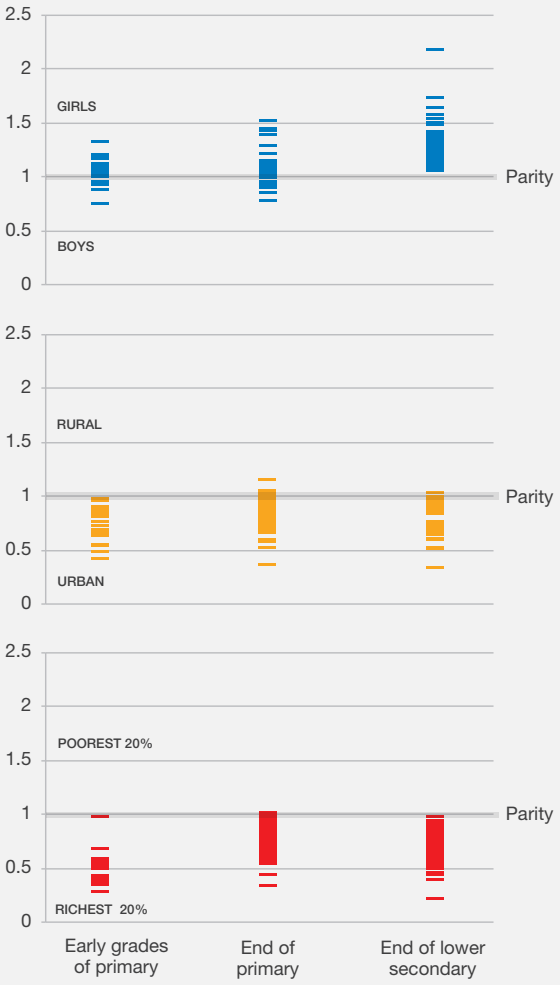
Target 4.a also includes a number of indicators to provide education facilities that are "child, disability, and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all". An indicator on the percentage of schools with adapted infrastructure, such as equal hygiene facilities and materials for students with disabilities, could reflect policy efforts to provide inclusive education.

### *How have inequalities been measured to date?*

A wide range of indicators has been used to look at education disparities. The parity index found In the SDG indicator framework was also part of the MDG framework to measure differences in enrolment rates by sex. The index represents the ratio of the indicator value for girls to the value for boys. By convention, values between 0.97 and 1.03 are interpreted to reflect parity, while values below 0.97 show an advantage for boys, and values above 1.03 reflect an advantage for girls.

**Figure 19** shows the use of parity indices based on measures of learning achievement (Target 4.1) at different stages of the educational system. It shows

**Figure 19. Parity indices by level of learning and sex, location and wealth**




**Note:** The figures represent national values for parity for the relevant characteristic in achieving minimum learning levels (e.g. proportion of girls achieving minimum learning levels divided by the proportion of boys).
*Source: UNESCO Institute for Statistics*

how inequality is observed at all stages of primary and secondary education.

In general, the use of equity indicators depends on policy needs and the attributes of interest (*see* ***Table 14***). The aspects of equity can be classified as inputs, outputs and outcomes. This follows the type of classification that is often used in programme planning by international organizations (see e.g. DFID, 2011; Parsons et al., 2013). On the whole, inputs are the aspects of the education system that the government has relatively direct control over (such as total spending) while outputs are the direct results of those inputs (e.g. participation rates). Outcomes are the ultimate goals that the system as a whole is supposed to fulfil, such as learning outcomes.

Equity also encompasses attributes of the individual, such as sex, location, ethnicity, language, disability status, engagement in child labour and household characteristics, such as parental education, wealth or other measures of socio-economic status.

### *What are the existing initiatives to measure equity?*

At present, data and indicators to monitor equity in education are generated by a diverse range of national (*see* ***Table 15***) and international organizations, which use different standards for quality assurance, data handling and reporting. There is no single comprehensive, authoritative platform for the dissemination of the data and associated methodologies required to monitor progress towards the 2030 goals.

Nevertheless, there has been a flurry of activity in the production of data and indicators to measure equity in education at the global level, with a growing number of actors, sources and methodologies.

**Table 14. Aspects and possible education indicators for equity measures**

Inputs:
- government educational expenditure (total, per pupil, or per school-age child)
- private educational expenditure (total, per student, or per school-age child)
- schools and classrooms (total, per pupil, or per school-age child)
- teachers, or pupil-teacher ratio
- qualified teachers, or pupil-qualified teacher ratio, or qualified teachers as a proportion of all teachers
- teacher quality (e.g. based on lesson observation or teacher competency assessments)
- school infrastructure
- quality of school management

Outputs:
- access and participation (adjusted net enrolment rate or adjusted net attendance rate)
- progression (completion, retention, survival, drop-out)

Outcomes:
- highest grade attained
- learning outcomes
- literacy, numeracy skills

*Source: UNESCO Institute for Statistics*

**Table 15. Data sources and equity measurement**

| Data Sources | Uses | Caveats |
|---|---|---|
| Policy questionnaires to education ministries | Documents intended to map national policies, procedures and processes | Only cover "input" side of equality of opportunity. Reflects design, which is important, but more difficult to capture actual implementation of policies |
| Annual school census | School input variables and attendance | Direct tool for administrative action, valid for a number of schools but has a limited range of variables, only covers schools regulated by the Ministry of Education, and contains possible biases in reporting |
| Surveys of schools, teachers and students | Detailed school level practices and procedures, learning outcomes | Explores issues related to teaching and learning but excludes data on children who are not in school and specific population groups. Also limited in collecting information on household/parental characteristics |
| General purpose National Household Surveys | Household characteristics, attendance, attainment, employment | Representative of the national population but high variances for small samples (e.g. disabled); excludes some disadvantaged populations (e.g. orphanages) |

*Source: UNESCO Institute for Statistics*

A recent review identified more than 25 data exercises that have been used to produce equity-related measures (Daga et al., 2016). These include international research projects and initiatives such as the World Bank database "Educational Attainment and Enrolment Around the World"; the UIS global education database which uses internationally standardised household surveys to produce disaggregated data and equity indicators (http://data.uis.unesco.org/); and the DME-WIDE database started by the Education for All Global Monitoring Report in 2009 and which now includes a large range of disaggregated data and indicators covering different aspects of education.

There are also smaller scale initiatives (e.g. Young Lives, ASER), which have been instrumental in improving monitoring and knowledge of education, learning and equity-related issues; and all primary household survey-based data collections such as the Demographic and Health Survey (DHS), MICS and various international learning assessments.

As shown in **Table 16**, these initiatives can be classified by several criteria: purpose; focus on education (general surveys which include a few education questions as background variables or an education specific survey); aspects of education of interest (e.g. access, participation, transition/retention, learning outcomes, attainment); level of education.

Most international reporting focuses on the same three dimensions (sex, location and wealth), using the same data sources (mainly the DHS and MICS) and thus covering mainly the same group of developing countries (despite the universal nature of the SDG agenda). It is therefore not surprising that the discourse at the international level is focused on investing in more and better international household surveys.

However, some experts would counter that household surveys are not focused on education or equity-related issues. In order for household surveys to better measure equity in education, they must

## Table 16. International initiatives used to measure equity in education

| Initiative / Survey | Institution | ISCED level | | | | | Equity dimension | | | | | | | | | Which aspect of education? | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ISCED 0 | ISCED 1 | ISCED 2 | ISCED 3 | ISCED 4+ | Sex | Rural/Urban | Wealth | Disability | Location | Language | Ethnicity | Conflict-affected | Other | Resources/Inputs | Access | Participation | Retention/Survival | Attainment | Learning outcomes | Literacy/Skills |
| **International data exercises (multiple data sources)** | | | | | | | | | | | | | | | | | | | | | | |
| UIS—Administrative data | UIS | | | | | | | X | X | X | X | X | X | X | X | | | | | | X | |
| UIS—Household survey data | UIS | X | | | X | X | | | | X | X | X | X | X | X | X | X | | X | X | X | X |
| Educational Attainment and Enrollment around the world | World Bank | X | | | X | X | | | | X | X | X | X | X | X | X | X | | | | X | X |
| DME-WIDE | UNESCO GEMR | | | | | X | | | | X | | | | X | X | X | | | X | | | X |
| Ed. Stats /Education Equality | World Bank | X | | X | X | X | | | | X | | X | | X | X | | X | | | | X | X |
| Socio-Economic Differences in Health, Nutrition, and Population | World Bank | X | | X | X | X | | X | | X | X | X | X | X | X | X | X | | X | | X | X |
| data.unicef.org | UNICEF | X | | X | X | X | | | | X | X | X | X | X | X | X | X | | | X | X | |
| Understanding Children's Work | ILO, UNICEF, WB | X | X | X | X | X | | | X | X | X | X | X | X | | X | X | | X | X | X | X |
| UNGEI | UN | X | | | X | X | | X | X | X | X | X | X | X | X | X | X | | | X | X | |
| OECD.stat | OECD | | | | | | | X | X | X | X | X | X | X | X | | | | | | X | X |
| **International data exercises (single data source)** | | | | | | | | | | | | | | | | | | | | | | |
| TIMMS | IEA | X | | | X | X | | | | X | X | | | X | X | | X | X | X | X | | X |
| PIRLS | IEA | X | | | X | X | | | | X | X | | | X | X | | X | X | X | X | | X |
| PISA | OECD | X | X | X | | X | | | | X | X | | | X | X | | X | X | X | X | | X |
| DHS | ICF International | X | | | | | | | | | | | | X | | X | | | | | X | |
| MICS | UNICEF | X | | | | | | | | | | | | X | | X | | | | | X | |
| **Regional data exercises** | | | | | | | | | | | | | | | | | | | | | | |
| UIS - Asia Survey on Teachers | UIS | X | | | | X | | | | X | | X | X | X | X | | X | X | X | X | X | X |
| PASEC | CONFEMEN | X | | X | X | X | | | | | X | | | X | X | | X | X | X | X | | X |
| SACMEQ | SACMEQ | X | | X | X | X | | | | X | X | | X | X | X | | X | X | X | X | | X |
| LLECE, SERCE, TERCE | UNESCO | X | | X | X | X | | | | X | X | | X | X | X | | X | X | X | X | | X |
| TransMonEE | UNICEF | | | | | X | | X | X | | X | X | X | X | X | X | X | | X | X | X | X |

*Source: Daga et al., 2016*

include new, robust variables which adhere to current international standards. Past experience has shown that education is not always sufficiently recognised in the decisionmaking process of international questionnaire design.

There is a critical need to advance the measurement agenda to take into account more fully some of the most vulnerable populations, namely children and youth with disabilities and forcibly displaced populations (e.g. refugees and internally displaced people). This will require new techniques, such as oversampling, which can have substantial costs as in the case of adding education questions to a household survey.

All this leads to increased transaction costs for members of the global education community, including countries, donors, and international organizations. Stronger coordination is clearly required to adopt a sustainable approach to comprehensively measure equity in education and avoid the narrow approach taken in the past which only focused on specific aspects.

### *Key challenges to measuring equity*

- What is the underlying conceptual framework?
- Which databases are available? What new data need to be collected?
- Which indicator is the right fit for the conceptual framework (parity index, odds ratio, concentration index, Gini coefficient, etc.)?
- What are the broader challenges and data availability issues related to equity?
- What is achievable in the short run and which areas would require substantial efforts?
- What are the priorities in terms of levels of education? Should measures concentrate on basic education or on all levels of education?

### *Developing an agenda for measuring equity*

What is the current global capacity to respond to the needs of both the international community and of countries with regard to measuring equity in education? Efforts to provide data and indicators to monitor equity in education should not come at the expense of data quality, nor should they be disregarded because the environment is inherently difficult in vulnerable situations or because resources are scarce. Thus far, Member States have yet to fully integrate equity as part of their regular national monitoring of education and the international community has not provided a coordinated and centralised response to these crucial data needs. Instead, there is patchwork of sparse and sometimes isolated initiatives.

The new impetus given by the SDGs triggers the need to come with a shared and agreed-upon strategy. This approach will require building consensus on: the definition of equity, common metrics and standards, and coordination mechanisms to reduce transaction costs.

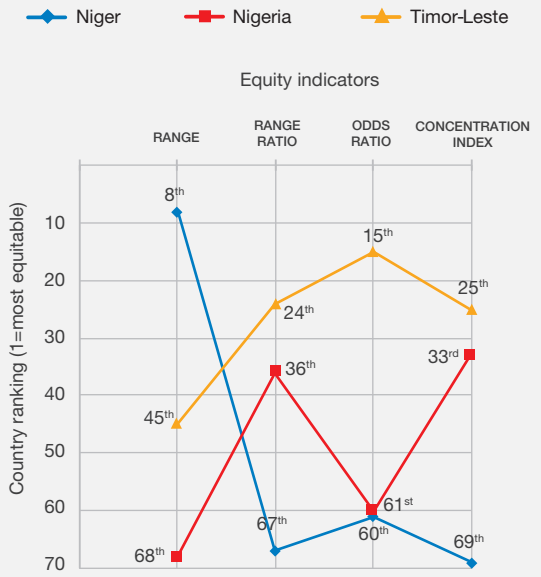
### *Agreeing on the definition of equity*

There is a longstanding debate in political philosophy, ethics and economics on the meanings of equity and equality and how to define educational equity. And if the conceptual challenges are considerable, then defining, framing and making operational indicators faces the same challenges. Education indicators can include inputs such as education expenditure, as well as outputs such as children's learning outcomes. It is important to note that the political or moral meaning of these principles depends on the indicator being measured. It is, for example, quite different for governments to ensure equal funding to every

individual to ensuring that every child reaches an equal level of learning outcomes.

Although it is difficult to agree on the concept, some guiding principles can provide greater perspective. For example, the *equality of condition* requires that everyone should receive the same quality of education. *Minimum standards* mean that everyone's education should at least meet the same minimum standard. Impartiality means that an education does not depend on wealth, ethnic group or any other characteristic but only on effort. *Meritocratic* education demonstrates that everyone receives an education according to their ability or merit. *Redistributive* requires that everyone receives an education according to their need or is compensated for disadvantage. *Procedural equity* requires that whatever the principle of equity being espoused, laws, policies, and procedures should be set up for the principle to be made a reality. These principles have different meaning depending on the good being considered and how it is measured.

**Figure 20. Inequalities in the completion of lower secondary education by household wealth according to four equity-related indicators**




*Source: UNESCO Institute for Statistics*

## *Agreeing on common metrics and standards*

As previously explained, Target 4.5 specifically calls for the use of the parity index to measure inequalities although countries may use additional indicators to better meet their specific need for national monitoring.

Despite the global consensus around the parity index, further precision is needed to define the metrics and standards which directly affect its interpretation. When comparing enrolment rates by sex, for example, values between 0.97 and 1.03 are generally considered to reflect parity. This may need to be redefined so that it is symmetrical around 1 and limited to a range of 0 to 2.

However, caution is advised when using the index for different indicators. For example, the percentage of out-of-school children of primary school age is the residual of the adjusted net attendance rate; one can be calculated as 100% minus the other. But the resulting gender parity index of the out-of-school children rate can be very different from that of the adjusted net attendance rate, even though both indicators essentially reflect a similar concept. Another disadvantage is that for countries with attendance rates or similar indicators close to 100%, parity indeces tend to be near 1 (i.e. parity), while for countries close to 0%, parity indeces can take on extreme values; and in either case, taking a negatively-phrased version of the same indicator will lead to different results.

More importantly, changing the parity index for another indicator, such as the range or the odds-ratio, will result in substantial changes in identification of performance at the system level. **Figure 20** illustrates the changes in ranking with regard to equity performance for more than 70 countries when

using four equity indicators (range, range ratio, odds ratio and concentration index) to measure wealth-related inequalities at the end of lower secondary education. It is not uncommon for a country to be among the top performers according to one indicator and to be among bottom performers according to another indicator.

### *Coordinating initiatives and reducing transaction costs*

Many of the issues outlined above will be addressed through better collaboration between international agencies involved in the production of global education statistics. There should be a global strategy to ensure the establishment of a global public good for the monitoring of equity in education (*see* ***Box 23***).

**Box 23. Working towards better monitoring of equity for SDG 4-Education 2030**

With the heightened focus on equity issues in the SDGs, greater attention must be given to coordination to ensure that common standards related to the collection and processing for reporting of indicators are maintained. These should be based on disaggregated data but should also be related to equity measures more generally.

This has become a more pressing issue because national data and indicators are being generated by a wide range of organizations, without a common, transparent approach (and often without any quality assurance procedures). This means that many different figures come from the same data source.

Unpacking the factors which lead to different indicators generates increased transaction costs for members of the global education community including countries, donors, and international organizations willing to engage with the monitoring of equity in education for the SDG 4-Education 2030 agenda.

Thus, it is vital to reach consensus on a common, comprehensive, authoritative platform for reporting the indicators required for tracking progress towards the 2030 goals. In response, the UIS and other stakeholders are joining forces to build a global public good towards harmonising and improving the measurement of equity in education.

This includes four main streams of work:

- Defining and implementing harmonised standards for the measurement of equity in education with the help of IAG-EII.
- Building a global repository of disaggregated education data through standardised processing and quality assurance protocols for a wide range of data sources and the calculation of internationally comparable indicators to monitor the SDG 4.
- Improving accessibility, dissemination and use of data through the development of an international observatory on equity and inclusion in education to offer data and resources for policy makers, analysts and other users. The observatory will produce a regular snapshot of the state of the world's education inequalities; develop reference methodological resources for Member States and stakeholders willing to engage with the measurement of equity in education (indicators factsheets, data quality assessments, etc.) and highlight approaches and methodologies to include the most vulnerable.
- Through a global and participatory approach the UIS is seeking to support Member States in their efforts towards improving their statistical systems by providing them with reference resources for the collection, production and dissemination of equity-related data and indicators. This is combined with direct support to statistical capacity on the ground through the development of training for national statisticians and support to national strategies for the development of education statistics that have equity at their core.

*Source: UNESCO Institute for Statistics*

## CONCLUSION

The new global education agenda is both inspiring and daunting. Its ambitious nature presents a series of unparalleled measurement challenges to countries and the wider international community. In particular, the priority given to learning and equity demands the development of a new generation of internationally comparable data on education that can be used not just to monitor progress but to better target policies and resources at the national, regional and global levels.

In response, this report serves as a roadmap showing how the international education community can produce quality data with sufficient coverage while seizing the potential for economies of scale. Through a series of new initiatives such as the GAML, the UIS is operationalising its mandate to produce the data needed for SDG 4 by working with a wide range of partners. This approach is uniquely designed to maximise the comparative advantages of different initiatives at the national, regional and international levels in order to:

- develop indicators, global metrics and pilot approaches and take them to a global common scale;
- implement diagnostic tools to help map data sources and institutional structures;
- ensure quality in data collection processes;
- identify barriers and suggest interventions for improving data production and dissemination within an enabling environment; and
- promote the use of data for benchmarking progress, planning, advocacy and resource mobilisation.

Finally, it is essential to:

- ensure funding and capacity development for Member States; and
- better coordinate efforts at the national and international levels to avoid duplicating efforts and overburdening countries while reducing the transactions costs of the necessary actions.

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# Annex. Targets, concepts and indicators

| | |
|---|---|
| **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** | |
| 4.1 Learning | 1. Percentage of children/young people (i) in grades 2/3; (ii) at the end of primary; and (iii) at the end of lower secondary achieving at least a minimum proficiency level in (a) reading and (b) mathematics<br>2. Administration of a nationally representative learning assessment (i) in grades 2/3 (ii) at the end of primary and (iii) at the end of lower secondary |
| 4.1 Completion | 3. Gross intake ratio to the last grade (primary, lower secondary)<br>4. Completion rate (primary, lower secondary, upper secondary) |
| 4.1 Participation | 5. Out-of-school rate (primary, lower secondary, upper secondary)<br>6. Percentage of children over-age for grade (primary, lower secondary) |
| 4.1 Provision | 7. Number of years of (i) free and (ii) compulsory primary and secondary education guaranteed in legal frameworks |
| **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** | |
| 4.2 Readiness | 8. Percentage of children under 5 years of age who are developmentally on track in health, learning and psychosocial well-being<br>9. Percentage of children under 5 years of age experiencing positive and stimulating home learning environments |
| 4.2 Participation | 10. Participation rate in organized learning (one year before the official primary entry age)<br>11. Gross pre-primary enrolment ratio |
| 4.2 Provision | 12. Number of years of (i) free and (ii) compulsory pre-primary education guaranteed in legal frameworks |
| **4.3 By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university** | |
| 4.3 Participation | 13. Gross enrolment ratio for tertiary education<br>14. Participation rate in technical-vocational education programmes (15- to 24-years old)<br>15. Participation rate of youth and adults in formal and non-formal education and training in the last 12 months |

| | |
|---|---|
| **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** | |
| 4.4 Skills | 16.1 Percentage of youth/adults who have achieved at least a minimum level of proficiency in digital literacy skills<br>16.2 Percentage of youth/adults with information and communications technology (ICT) skills by type of skill<br>17. Youth/adult educational attainment rates by age group, economic activity status and programme orientation |
| **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** | |
| 4.5 Policy | … Parity indices (female/male, rural/urban, bottom/top wealth quintiles and others, such as disability status, indigenous peoples and conflict-affected populations, as data become available) for all education indicators on this list that can be disaggregated<br>18. Percentage of students in primary education whose first or home language is the language of instruction<br>19. Extent to which explicit formula-based policies reallocate education resources to disadvantaged populations<br>20. Education expenditure per student by level of education and source of funding<br>21. Percentage of total aid to education allocated to low income countries |
| **4.6 By 2030, ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy** | |
| 4.6 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<br>23. Youth/adult literacy rate |
| 4.6 Participation | 24. Participation rate of youth/adults in literacy programmes |
| **4.7 By 2030, ensure that all learners acquire the 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** | |
| 4.7 Provision | 25. Extent to which (i) global citizenship education and (ii) education for sustainable development, including gender equality and human rights, are mainstreamed in (a) national education policies (b) curricula (c) teacher education and (d) student assessment |
| 4.7 Knowledge | 26. Percentage of students by age group (or education level) showing adequate understanding of issues relating to global citizenship and sustainability<br>27. Percentage of 15-year old students showing proficiency in knowledge of environmental science and geoscience |

| | |
|---|---|
| 4.7 Provision | 28. Percentage of schools that provide life skills-based HIV and sexuality education<br>29. Extent to which the framework on the World Programme on Human Rights Education is implemented nationally (as per UNGA Resolution 59/113) |
| **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** | |
| 4.a Resources | 30. Percentage of schools with access to (i) basic drinking water; (ii) single-sex basic sanitation facilities; and (iii) basic handwashing facilities (as per the Water, Sanitation and Hygiene for All (WASH) indicator definitions)<br>31. Percentage of schools with access to (i) electricity; (ii) Internet for pedagogical purposes; and (iii) computers for pedagogical purposes<br>32. Percentage of schools with access to adapted infrastructure and materials for students with disabilities |
| 4.a Environment | 33. Percentage of students experiencing bullying, corporal punishment, harassment, violence, sexual discrimination and abuse<br>34. Number of attacks on students, personnel and institutions |
| **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 and information and communications technology, technical, engineering and scientific programmes, in developed countries and other developing countries** | |
| 4.b Numbers | 35. Number of higher education scholarships awarded by beneficiary country<br>36. Volume of official development assistance flows for scholarships by sector and type of study |
| **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** | |
| 4.c Qualified | 37. Percentage of teachers qualified according to national standards by education level and type of institution<br>38. Pupil/qualified teacher ratio by education level |
| 4.c Trained | 39. Percentage of teachers in: (a) pre-primary; (b) primary; (c) lower secondary; 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<br>40. Pupil/trained teacher ratio by education level |
| 4.c Motivated | 41. Average teacher salary relative to other professions requiring a comparable level of education qualification<br>42. Teacher attrition rate by education level |
| 4.c. Supported | 43. Percentage of teachers who received in-service training in the last 12 months by type of training |

The elaboration of the indicators framework to track progress towards the new 2030 Agenda for Sustainable Development marks a critical moment for global development. But what indicators will be used to track progress and how were they chosen? What are the implications for national education data and information systems – are they ready to monitor an ambitious agenda which prioritises education quality and equity? What are the barriers that countries face in producing and using good-quality data? And what initiatives at the national and international levels could help build greater technical capacity and mobilise attention and resources for measurement, ensuring a strong link between the data gathered and national plans and policy objectives they are meant to inform?

This report aims to answer these questions and serve as a roadmap to measure SDG 4 and Education 2030 by examining the key issues and challenges in implementing the new indicator frameworks. It is the first report in a new series that will report annually on advances towards better measurement and use of data, focusing on difficult-to-measure areas and sharing good practices, especially in relation to the key SDG themes of education quality, learning, equity and inclusion. This is essential to produce the robust data and evidence needed by a wide range of national and international stakeholders to design, target and evaluate policy interventions while charting progress towards the development goals.

Can the SDGs succeed in changing the world in 15 years? We will not know without the data to tell us. The data needed to drive change starts within the system – by responding to national policies and priorities. To achieve the ambitious goals, it is critical to anchor and support measurement efforts within national systems.

ISBN 978-92-9189-197-9


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