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Institute for Statistics

2025 Report

National Education Statistical Capacity Assessment

Global analysis based on a maturity model

LASER
for Education Information Ecosystem

The UNESCO Institute for Statistics (UIS) is the statistical office of UNESCO and is the UN depository for global statistics in the fields of education, science, technology and innovation, culture and communication. The UIS was established in 1999. It was created to improve UNESCO's statistical programme and to develop and deliver the timely, accurate and policy-relevant statistics needed in today's increasingly complex and rapidly changing social, political and economic environments.

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FOREWORD

The Sustainable Development Goals (SDGs) and the Education 2030 Framework for Action set a bold and ambitious agenda to ensure inclusive, high-quality education and equitable learning opportunities for all. The introduction of a comprehensive framework with 43 global and thematic indicators underscores the importance of international education monitoring, and puts unprecedented demands on countries to produce high-quality, comparable education data. While access to primary education has expanded since 2000, progress on improving learning outcomes and equitable opportunities remain uneven. A key lesson is the need for strong quantitative measures to monitor the development and implementation of education policies at national and international levels.

As the 2030 deadline approaches, countries still face significant challenges despite the strides made in strengthening their statistical systems. These challenges are mainly due to the scope and complexity of the new indicators affecting data collection, accuracy, and reporting. Many countries still lack the capacity to generate timely and reliable data, affecting their ability to track progress and contribute to global monitoring efforts. Despite ongoing efforts, data gaps remain, particularly in low-resource settings. A major challenge is aligning national statistics with international standards, leading to tensions over data harmonization. Clear communication, shared methodologies, and greater investment in statistical capacity to balance national priorities with global reporting requirements are essential.

Recognizing these challenges, the UNESCO Institute for Statistics (UIS) played a pivotal role in supporting countries by developing methodologies, setting international standards, and fostering collaboration among stakeholders under the auspices of the Education Data and Statistics Commission. The mandate of the Institute is based on a three-pillar approach to a data revolution in education: creating an enabling environment where governments, civil society, and development partners can use education data for informed decision-making, accountability, and policy action; producing high-quality, internationally comparable data by supporting methodological advancements, standard-setting, and robust data collection mechanisms; strengthening data dissemination and use, ensuring education data is accessible, understandable, and actionable for policymakers, researchers, and the broader global community.

To boost countries' statistical capacity, UIS launched LASER tool in 2024 during the UNESCO Conference on Education Data and Statistics. LASER operates as an education statistical capacity assessment, adopting a holistic approach to assess whether a country's education data ecosystem is collecting and effectively using the variety of data sources required for policymaking and the overall governance of the education sector. LASER adds value to efforts of national education statistical capacity development by improving the understanding of the opportunities and challenges of leveraging multiple data sources to meeting the data demands for monitoring both country-specific goals and SDG 4.

The report ***National Education Statistical Capacity Assessment: Global Analysis Based on a Maturity Model*** is the first in a series of annual UIS publications presenting a global assessment of the status and capacity of education data ecosystems in 205 countries. It identifies strengths and gaps and provides guidance in the generation of education data. It shows how UIS works with countries to strengthen their national education statistical systems and lays the foundation for the cross-national data comparability needed to monitor progress globally. It is based on the results of a series of diagnostic evaluations of data quality and availability for each of the data sources and dimensions for policy use.

The LASER technical package includes this global report and its accompanying online platform that allows the generation of individual LASER country profiles known as ***National Education Statistical Capacity Assessment: Global Analysis Based on a Maturity Model***. These profiles give an overview of the education data ecosystem in a country, evaluating its performance across various LASER dimensions.

As the global community works toward achieving SDG 4, the need for high-quality, relevant, and internationally comparable education data has never been more critical. Moving forward, sustained investment in education data systems, capacity-building initiatives, and cross-national cooperation will be essential. The UIS remains committed to supporting countries in meeting these challenges, ensuring that education data continues to serve as a powerful tool for advancing learning outcomes and equity worldwide.

Silvia Montoya

Director, UNESCO Institute for Statistics

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Since wars begin in the minds of men and women, it is in the minds of men and women that the defenses of peace must be constructed

ACKNOWLEDGEMENTS

The ***National Education Statistical Capacity Assessment: Global Analysis Based on a Maturity Model***, (LASER report) is a product of collaboration between the UNESCO Institute for Statistics (UIS) and Member States. Rooted in the LASER initiative, this report reflects the Institute's ongoing partnership with countries and stakeholders to strengthen education data ecosystems worldwide. The initiative owes its vision and framework to UIS Director Ms. Silvia Montoya, who conceptualized the LASER approach and guided the development of this report and associated products at every stage.

The publication was produced by the Global Coordination team-Silvia Montoya, Adolfo Imhof, Lina Ktaili.

We acknowledge Adolfo Imhof for compiling the global database that underpins this publication and its accompanying country profiles, and Tiago Vier for his significant contributions to developing the platform that generates LASER country profiles.

Colleagues from the UIS Regional Field Network—Alpha Bah, Manuel Alcaino Izquierdo, Roshan Bajracharya, Shailendra Sigdel, and Benita Nyampundu—enriched this report with their invaluable regional perspectives and contributed to the self-assessment sections and examples from national experiences.

At UIS headquarters, the Global Coordination and Education teams were instrumental in driving this project to completion. We particularly thank Yanhong Zhang for his rigorous review and thoughtful feedback and Joseph Naim for designing the publication's layout.

Finally, we appreciate Abracadabra's creative design of the LASER visual elements, which enhance the report's clarity and accessibility.

ACRONYMS

AMPL	Assessments for Minimum Proficiency Levels
API	Application Programming Interface
BDDS	Bulk data download service
CARICOM	Caribbean Community
CNA	Cross National Assessments
CP	Country Profile
CR	Completion Rate
ECE	Early Childhood Education
EDSC	Education Data and Statistics Commission
EMIS	Educational Management Information Systems
ERCE	Regional Comparative and Explanatory Study
EU	European Union
FFA	Education 2030 Framework for Action
FIML	Full Information Maximum Likelihood
FLA	Foundational Learning Assessments
GAML	Global Alliance to Monitor Learning
GEMR	Global Education Monitoring Report
GFS	Government Finance Statistics
GIS	Geographic Information Systems
GPF	Global Proficiency Framework

HHS	Household Surveys
HIC	High Income Income Countries
HLSC	High-Level Steering Committee
IAEG-SDGs	Inter-Agency and Expert Group on SDG Indicators
ICT	Information and Communications Technology
ILO	International Labour Organization
IMF	International Monetary Fund
ISCED	International Standard Classification of Education
ISWGHS	Inter-Secretariat Working Group on Household Surveys
LA	Learning Assessment
LFS	Labour Force Survey
LIC	Learning Outcomes
LO	Learning Outcomes
LMIC	Lower-Middle Income Countries
LSMS	Living Standards Measurement Study
MDG	Millennium Development Goals
MICS	Multiple Indicator Cluster Surveys
MOE	Ministry of Education
MPL	Minimum Proficiency Level
MS	Member States
NA	National Assessments

NSO	National Statistical Office
OECD	Organisation for Economic Co-operation and Development
OOSC	Out-Of-School Children
OOS	Out-Of-School rates
OPRI	Other Policy Relevant Indicators
PISA	Programme for International Student Assessment
PIRLS	Progress in International Reading Literacy Study
SAARC	South Asian Association for Regional Cooperation
SDG	Sustainable Development Goals
SES	Socioeconomic Status
TCG	Technical Cooperation Group on SDG 4 indicators
TES	Transforming Education Summit
TIMSS	Trends in International Mathematics and Science Study
TVET	Technical and Vocational Education and Training
UIS	UNESCO Institute for Statistics
UMIC	Upper-Middle Income Countries
UNESCO	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNPD	United Nations Population Division

Readers' guide

As educational data demands grow increasingly complex, LASER seeks to strengthen countries' capacity to monitor education comprehensively through multidimensional approaches. In this report, we explore how LASER serves as an effective and powerful self-assessment tool for Member States (MS) to evaluate their education data capabilities, identify gaps, and pinpoint specific areas requiring capacity building and support in alignment with SDG4 objectives.

By offering a structured framework, LASER enables MS to assess each dimension of their education data ecosystem systematically, from administrative data to inequality measures, and align their efforts with global frameworks such as SDG4. The LASER report, ***National Education Statistical Capacity Assessment: Global Analysis Based on a Maturity Model***, presents concrete examples and actionable recommendations to guide MS in leveraging LASER for comprehensive self-assessments. It illustrates how LASER can be applied across various dimensions to enhance data quality, coverage, and regularity, and to strengthen education data ecosystems. By focusing on practical applications, it underscores LASER's role as a catalyst for targeted improvements, ensuring that data systems are equipped to inform evidence-based policymaking and address the evolving challenges of the education sector.

The utility of LASER is discussed across two key policy dimensions:

Strategic Level	Operational Level
Provides insights for high-level discussions on resource allocation, policy priorities, and collaboration frameworks.	Offers detailed, actionable insights through the LASER Country Profile to guide programmatic decisions.
Supports governments, regional agencies, and development partners in identifying strengths as well as gaps requiring investment or technical assistance.	Enables enhancement of reporting mechanisms like EMIS forms or surveys to address data gaps.
Facilitates cross-border cooperation by highlighting shared challenges and opportunities.	Guides the development of tailored capacity-building programs for data producers and users.
Aligns funding priorities with evidence-based needs to strengthen education data ecosystems.	Prioritizes initiatives that improve data reliability and relevance, ensuring alignment with SDG4 indicators.

The LASER report begins with an executive summary that outlines the main conclusions, includes the global statistical capacity maturity for each LASER component, and analyzes the distribution of countries by income and statistical capacity. It concludes with key questions that data can help answer.

Chapter 1 provides an overview of the education data ecosystem and its key producers. Chapter 2 introduces the SDG 4 global and thematic indicator framework, highlighting the need for multiple data sources to produce these indicators. Chapter 3 focuses on the role of the UIS in supporting Member States by strengthening their statistical capacity. It identifies key bottlenecks in education data production, discusses data reporting and availability, and presents the UIS' strategic framework for cooperation with countries.

Chapter 4 introduces the LASER tool, launched by the UIS in 2024, which assesses countries' educational statistical capacity based on a maturity model. Chapters 5 to 9 detail the five LASER components. Each of these chapters explores challenges and potential solutions, sub-components, analyses by income level and SDG region, a self-evaluation checklist, practical examples, and policy questions.

The final chapter provides a step-by-step guide to interpreting the LASER National Education Statistical Capacity Assessments (LASER country profiles). The annex includes additional resources such as ISCED level definitions, a list of SDG 4 indicators, a breakdown of education indicators by data source, LASER component and sub-component weights, distribution of countries maturity level by component, and LASER cut-off points.

Executive Summary

The 2030 Agenda is enormously ambitious, including from a statistical perspective. New concepts were put forward for measurement. But many were far ahead of the available statistics and an appropriate approach to generate indicators often did not exist. There were doubts whether it was even feasible to reach consensus on definitions. Education remains a fiercely national domain of policy, where each country uses a different language and has a different understanding of the same concepts.

The demands are increasing. Historically, education statistics relied on a single source of data. But as health and labor statistics have shown, it is no longer tenable to ignore the existence of multiple data sources for which we need new methods to use efficiently. The UIS and GEMR have introduced estimation using modern techniques relying on Full Information Maximum Likelihood (FIML) and Bayesian model for two indicators – the completion rate and out-of-school rate – and we believe such approaches should be extended to other indicators.

Although the scope of the 2030 Agenda is universal and applies to all countries, clearly not all targets are relevant to every country. Striking a balance between national and global demands has proven challenging. The distinction between national and international official statistics and the significance or purpose of having both sometimes is still misunderstood.

National data may be superior, from the perspective of policy formation, as they can be integrated with other national data to present a coherent story; however, harmonized official statistics serve the role of ensuring comparability.

Data and information that help governments prioritize education challenges and allocate necessary resources rely on strong country data systems. These systems should be able to identify bottlenecks in the provision of education that prevent the attainment of education for all. Country education data and statistics systems also provide important data for global monitoring for the Sustainable Development Goals (SDGs) and other donor reporting.

Education data and statistics systems do not meet the data needs of countries. Despite the increasing demands for data and evidence, the EMIS currently in place in many countries are inadequate. High-quality data are not routinely collected in sufficient detail to allow regular computation of levels, trends and inequalities in educational outcomes at national and local levels.

A “culture of data” thrives on transparency, collaboration, participation, and openness. Internationally, a global community of practice establishes shared concepts, definitions, and methodologies. Like any field, translating data into effective policy requires capacity, political will, and adequate funding.

National benchmarks

In education sectors, countries were invited to set national targets for selected indicators for 2025 and 2030. Unlike previous development agendas, and unlike other sectors, we now have a unique mechanism in education in which countries share with the rest of the world what will be their contribution to improve the education of children and youth of their countries and their contribution to the global goal. The national benchmarks is a process that promotes accountability in a constructive way. But it is also a formative process that helps countries reflect on their targets. The benchmarking process also gave more focus to new kinds of capacity development needed for national statistical systems: how to invest in skilled people and strong institutions, but also how to nurture political leadership to use data for policy.

The process of receiving country benchmark submissions and assessing their progress brought to the surface differences in understanding on definitions and data sources even for this small set of eight indicators.

Education data ecosystem

A holistic approach to education data and statistics is critical for understanding and advice policy decisions to improve education outcomes. The information falls mainly within the purview of education ministries that face challenges at various levels, including tracking student enrollment, assessing teacher qualifications, and monitoring school infrastructure. Other sources also contribute to the understanding of education results: the first example is Ministries of Finance that manage some of the data on education expenditure, providing insights into budget allocation and expenditure; second example is national statistical agencies that conduct surveys or censuses that complements or substitutes data from administrative records. For instance, surveys collect information on individual and household background characteristics that permit disaggregation of education indicators by sex, location, income or wealth, ethnicity, language and disability (as well as the intersection of these characteristics). Such information helps identify possible causes of observed social and economic outcomes, which can be used in policy design, and provides insights into policy implementation.

Introducing LASER

The LASER acrostic reflects the following five characteristics of an education data ecosystem:

1. Learning assessment system meets international standards.
2. Administrative data on key indicators is regularly collected and covers major education issues and dimensions of inequality.
3. Survey population system collects education indicators and dimensions of inequality on a regular basis.
4. Expenditure data is reported regularly for all sources of private and public expenditure.
5. Review and Monitor Progress looks at accountability through the publication of indicators reports, the elaboration of national plans and the monitoring of progress through benchmarks.

This comprehensive type of approach aims to expand as, to this point, it is based on information already collected and or available publicly; however, countries' data ecosystems differ in the way they generate the information. The core goal, at this point, is to shift the conversation towards the crucial aspects of data needs and data quality. Essentially, it is about identifying what data is needed, how good that data is, and then building upon that foundation.

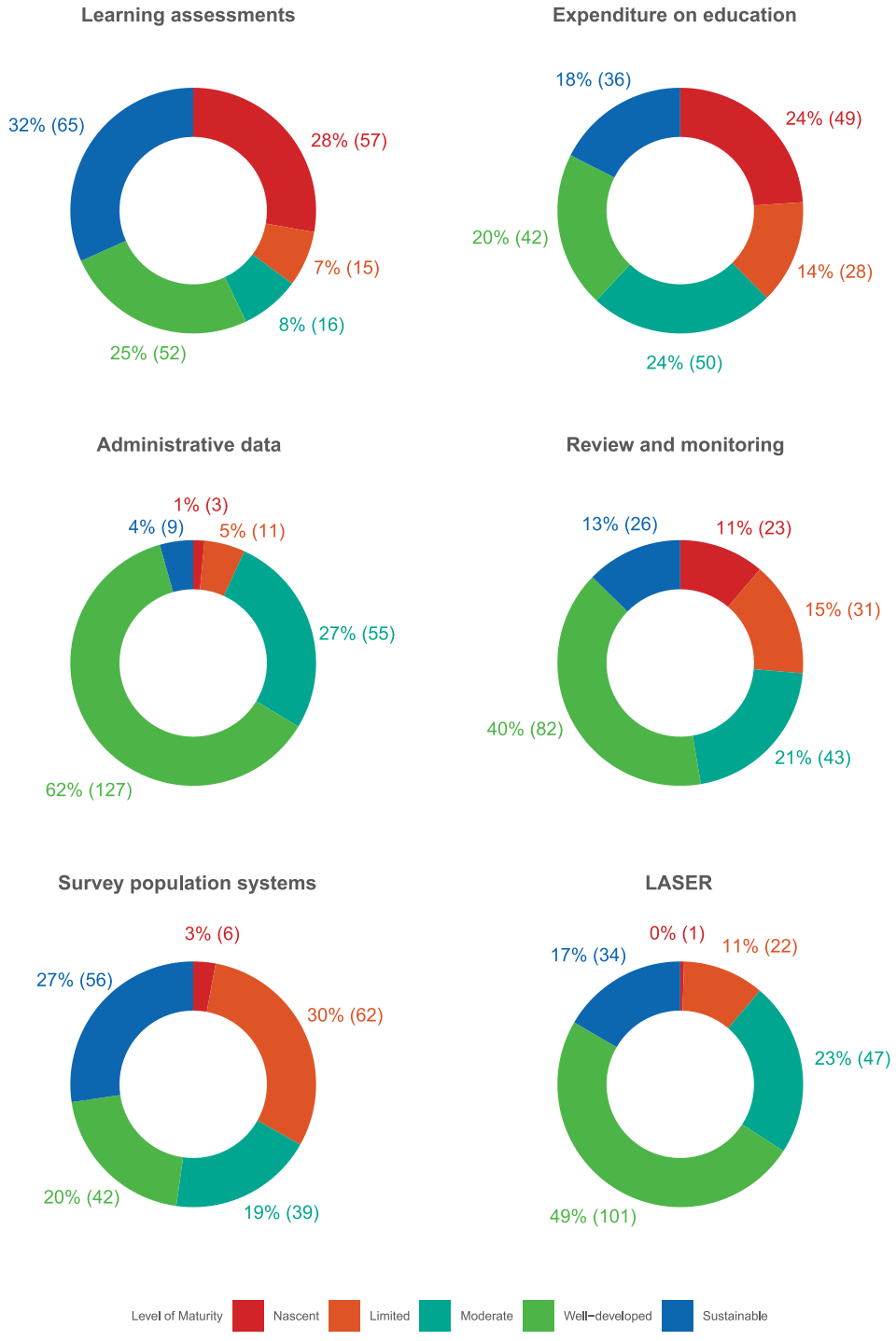
Looking at the education data ecosystems holistically in all sources and using the concept of "maturity" could be more helpful for focusing improvement of information for sound policymaking, avoiding silos. More specifically, maturity approach can serve as a diagnostic tool that enables countries to assess their current capabilities and maturity.

Maturity model approach

This first global analysis of education data systems is relying on a very simplified maturity model approach. It is structured as a series of levels towards full compliance of the aspects included to this point in the scoring of Education Statistical Capacity. The approach begins with an assessment of the level of current compliance of some basic parameters.

The purpose of a maturity model should not be to 'tick the box' and comply with the description of the highest maturity level, but to use it as a tool for achieving greater maturity over time. In other words, a country should focus on identifying ways to continuously improve rather than on attaining the highest maturity level – particularly as countries have limited resources and therefore need to prioritize their efforts to mature in what source and within the data source on the relevant policy aspects.

Statistical Capacity Maturity by Source of Data



Source: UNESCO Institute for Statistics (UIS)

Education statistical capacity - Maturity levels

Maturity Level	Characteristics	Recommendations
Nascent	• Poor coordination between data-producing institutions. • Limited or fragmented data collection. • Minimal compliance with international education data standards.	• Build basic enabling environment for data collection processes. • Align data collection with SDG4 indicators. • Develop initial capacity-building initiatives for data reporting.
Limited	• Data quality checks and validation processes are in development. • Low or no coverage of key education issues (e.g., bullying, home language). • Partial alignment with international reporting standards.	• Improve alignment with international standards. • Increase the frequency of data collection. • Implement some basic governance mechanism for data.
Moderate	• Partial coverage of key indicators (e.g., school connectivity, teacher training). • Basic governance for data is put into place to check. • Standardized data collection processes exist but may have gaps.	• Strengthen institutional coordination efforts. • Improve timeliness and completeness of education data reporting. • Expand coverage of key education issues.
Well-developed	• Education data ecosystem is well-structured and systematic. • High compliance with international reporting standards. • Use of data analytics to inform policy decisions.	• Ensure regular updates and maintenance of data. • Promote transparency and public access to education statistics. • Implement mechanisms for continuous data system improvements.
Sustainable	• Fully integrated, automated, and sustainable education data ecosystem. • Data is consistently used for policy formulation and decision-making. • High level of international collaboration and best-practice adoption.	• Strengthen long-term sustainability of data systems. • Leverage artificial intelligence and big data for deeper insights. • Regularly update methodologies to align with evolving global standards.

Source: UNESCO Institute for Statistics (UIS)

This report is particularly timely and highlights how important it is to strengthen a country's education data and statistics ecosystem to meet data needs. Among several key findings, the income divide between high and low-income countries is reflected in the lack of capacity to address fundamental areas such as the measurement of learning outcomes exactly where it is needed the most. While some countries have achieved sustainable capacity in some key areas, no country has a fully mature system capable of meeting their evolving needs for education data and statistics.

Statistical capacity improves with income

A look at the LASER scores by countries shows important discrepancies. The analysis helps determine the regions and countries where technical support in the production of SDG4 indicators is most needed and in which area.

The distribution of statistical capacity across countries varies significantly depending on income levels. **Figure 2** provides a comprehensive view of how different income groups, from low-income countries (LICs) to high-income countries (HICs), perform across multiple dimensions of statistical capacity. A clear trend emerges with higher-income countries generally having stronger statistical systems. Each component of statistical capacity, including Learning Assessments, Administrative Data, Survey Data, Expenditure Data, and Review and Monitoring, shows a distinct distribution pattern across income groups.

Low-income countries exhibit the weakest statistical capacity, with a large proportion of their data systems classified as Nascent or Limited. As income levels rise, moving from LICs to lower-middle-income countries (LMICs) and then to upper-middle-income countries (UMICs), a noticeable shift occurs towards Moderate and Well-developed statistical systems. High-income countries have the most advanced statistical systems, with a majority categorized as Sustainable, reflecting strong institutional capacity.

Looking at the individual components, Learning Assessments show a particularly high concentration of Nascent and Limited levels in LICs and LMICs, indicating challenges in data collection. Administrative and Survey Data are relatively stronger, with many countries, especially in middle-income groups, achieving Moderate or Well-developed capacity. Expenditure Data and Review/Monitoring capacity improve progressively with income, but weaknesses remain in LICs.

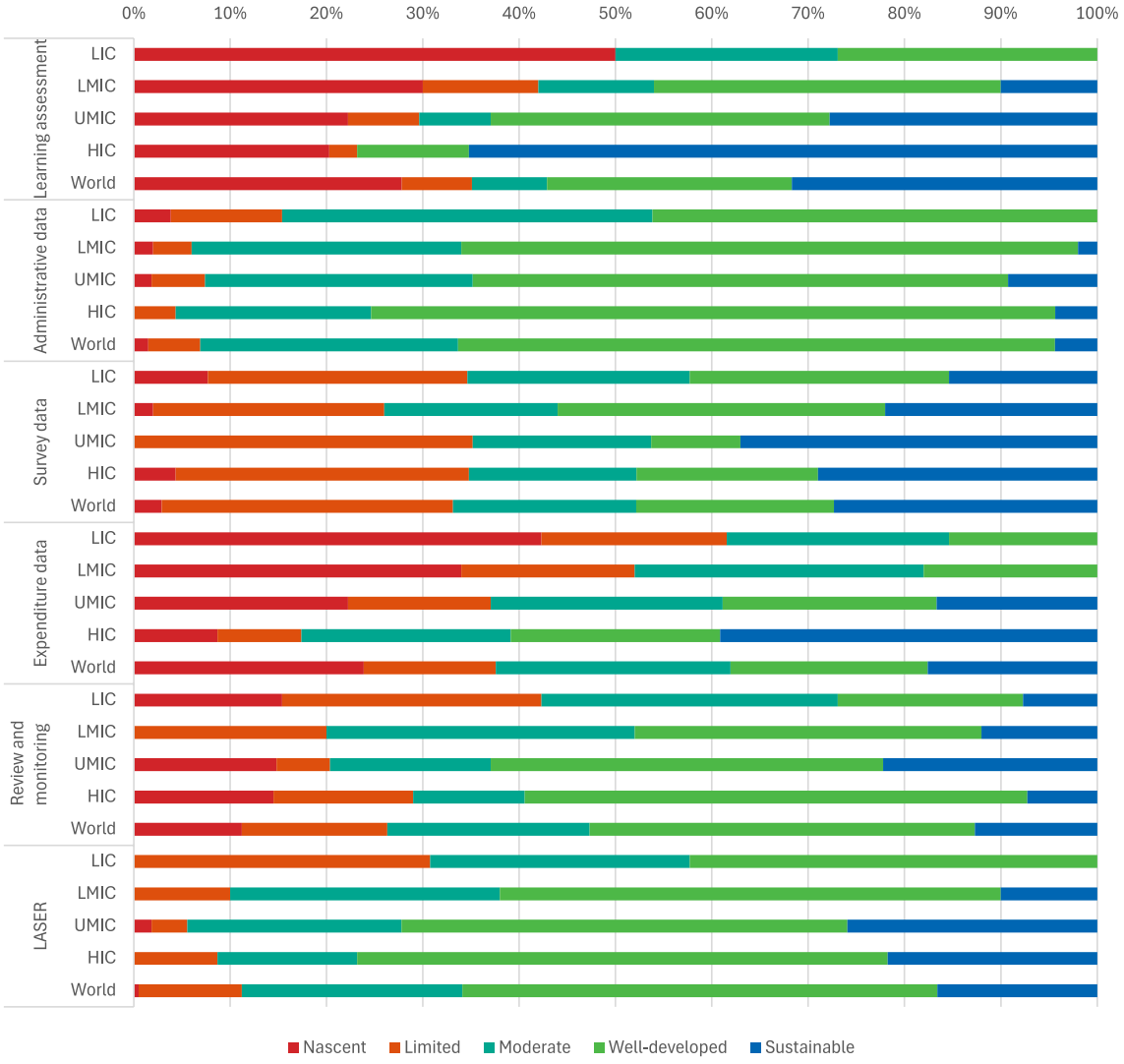
In conclusion, the data underscores the need for targeted improvements in statistical capacity, particularly in lower-income countries, where weaknesses in Learning Assessments and Expenditure Data are evident. Strengthening these areas is crucial for informed decision-making, effective policy implementation, and sustainable development.

Key takeaways:

- **Higher-income countries tend to have stronger statistical systems,** which allow for better data collection and reporting.
- **Lower-income countries need significant improvements** in statistical capacity, especially in Learning Assessments and Expenditure Data.
- **Administrative and Survey Data collection methods are relatively stronger,** even in middle-income countries.
- **Efforts should focus on strengthening weaker areas** (such as Learning Assessments) in lower-income countries to improve global statistical capacity.

Distribution of statistical capacity by component and country income group

Percentage of countries by statistical capacity



LIC	**Low Income Countries**
LMIC	**Lower-Middle Income Countries**
UMIC	**Upper-Middle Income Countries**
HIC	**High Income Income Countries**

Source: UNESCO Institute for Statistics (UIS)

LASER Country Profile

This global report is accompanied by the LASER Country Profile (CP) which is a powerful tool for assessing and improving national education data ecosystems. As a self-evaluation tool, the CP helps countries evaluate the maturity of their education data systems across five key components: Learning Assessments, Administrative Data, Survey Population System, Expenditure on Education, and Review and Monitoring; identify gaps in data quality, coverage, and alignment with international standards and prioritize areas for improvement; and develop targeted action plans to strengthen education data systems and support evidence-based policymaking..

Step 1: Self-evaluation

- **Gather data:** Collect data on each of the five LASER components using national education statistics, surveys, and administrative records. Ensure that the data includes the expanded dimensions (e.g., bullying, home language, school connectivity).
- **Score each component:** Use the LASER scoring matrix to assign a score (0-100%) to each component based on the scores of its sub-components, including quality, coverage, and alignment with international standards.
- **Determine maturity level:** Compare the scores with the maturity levels (Nascent, Limited, Moderate, Well-developed, Sustainable) to assess the current state of each component.

Step 2: Identify gaps

- **Review scores:** Identify components with low scores or gaps in coverage (e.g., missing data on school services such as school connectivity, or on enrolment in tertiary education).
- **Prioritize areas for improvement:** Focus on components that are critical for achieving SDG4 targets (e.g., improving learning assessments or expanding administrative data coverage).

Step 3: Develop action plans

- **Set targets:** Define specific, measurable targets for improving data systems (e.g., increase the frequency of learning assessments or expand coverage of school infrastructure data).
- **Allocate resources:** Identify the resources (financial, technical, human) needed to implement the action plans.
- **Monitor progress:** Establish a system for tracking progress toward the targets and adjusting strategies as needed.

Better Policy Through Data
Alignment with SDG 4 indicators

1. **Equity and access**
   - How does administrative data reveal disparities in student-teacher ratios across ISCED levels, regions, and school types (public/private), and how can this inform equitable resource allocation? (SDG 4.5, 4.c)
   - What does the geographic distribution of schools by ISCED level indicate about access gaps in rural, remote, or conflict-affected areas? (SDG 4.1, 4.5)
   - How can data on over-age children and grade repetition rates guide targeted interventions to improve retention and progression? (SDG 4.1)

2. **Inclusion and marginalized groups**
   - What percentage of students with disabilities are enrolled at each ISCED level, and how can this data improve policies for inclusive infrastructure and teacher training? (SDG 4.5, 4.a)
   - How many migrant, refugee, or displaced students are in the system, and what mechanisms ensure their access to quality education? (SDG 4.5, 4.1)

3. **Learning outcomes and system efficiency**
   - What does administrative data reveal about transition rates between ISCED levels, and how can this inform systemic reforms to reduce inefficiencies (e.g., high repetition rates)? (SDG 4.1)
   - How can administrative data track learning recovery (e.g., post-pandemic catch-up programs) to ensure foundational skills are met? (SDG 4.6)

4. **Teachers and workforce development**
   - How does administrative data track teacher distribution (e.g., rural vs. urban) and inform policies to address shortages? (SDG 4.c)
   - What percentage of teachers receive continuous professional development (CPD) aligned with curriculum reforms (e.g., climate education)? (SDG 4.c)

5. **Infrastructure and resilience**
   - How many schools meet climate-resilient infrastructure standards (e.g., flood-resistant buildings, renewable energy)? (SDG 4.a)
   - What mechanisms track the impact of climate-related disruptions (e.g., school closures due to floods) on enrollment and learning continuity? (SDG 4.a)

Systemic reforms, governance, and skills

1. Foundational learning and equity

- How does administrative data track learning outcomes and inform targeted interventions for foundational learning?
- What percentage of schools meet minimum standards for inclusive education (e.g., accessible infrastructure, trained teachers for disabilities)?

2. Service delivery and governance

- What mechanisms ensure real-time data reporting (e.g., EMIS dashboards) to monitor school performance and resource allocation?
- How does administrative data track teacher absenteeism and its impact on learning outcomes?

3. Citizen engagement and accountability

- How is administrative data made accessible to citizens (e.g., open data platforms) to promote transparency and accountability in education spending?
- What mechanisms ensure community feedback (e.g., surveys, town halls) is integrated into policy adjustments?

4. School management and leadership

- How does administrative data track the qualifications and training of school leaders, and how does this impact school performance?
- What percentage of schools have development plans informed by data on student needs and resource gaps?

5. Lifelong learning and human capital development

- How does administrative data track enrollment in lifelong learning programs (e.g., adult literacy, vocational training)?
- What mechanisms ensure skills certification programs align with labor market needs?

6. Connectivity and digital learning

- What percentage of schools have reliable internet connectivity and digital devices for hybrid learning?
- How does administrative data track the impact of EdTech tools on learning outcomes and equity?

7. Supply and demand dynamics

- How does administrative data track enrollment trends by ISCED level and inform infrastructure planning (e.g., new schools)?
- What mechanisms ensure demand-side incentives (e.g., scholarships, cash transfers) reach marginalized groups?

8. Systemic reforms

- How does administrative data inform multi-year budgeting for systemic reforms (e.g., teacher training, digital infrastructure)?
- What trends in administrative data (e.g., dropout rates, learning outcomes) guide scalable reforms?

9. Crisis preparedness and response

- How does administrative data track the reintegration of displaced learners (e.g., refugees) into national education systems?
- What percentage of schools have contingency plans for emergencies (e.g., pandemics, natural disasters)?

1. The education data ecosystem

High quality and timely data is critical for formulating and implementing effective education policies. It provides the evidence needed to set policy agenda ting, evaluate solutions, develop budgets, allocate resources efficiently, monitor implementation and evaluate results. Without reliable data, policymakers lack the foundation to make informed decisions, resulting in inadequate or misguided policies. However, producing high-quality and timely education data requires, among other things, investments of human and financial resources. When policymakers do not recognize may not always see its value, leading to insufficient support for education data systems.

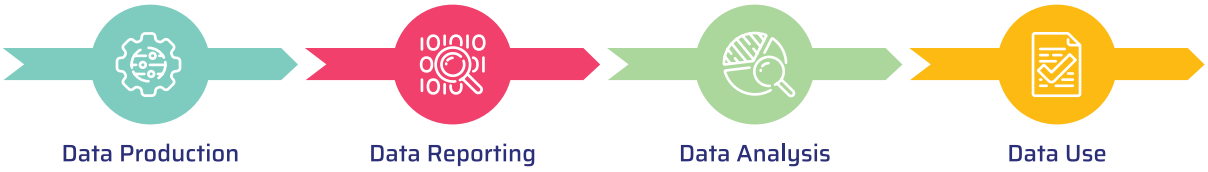
For data to effectively serve policymakers, it must first be available, of good quality, and presented in a clear, actionable way. Data helps policymakers understand the current situation, identify problems, and determine what changes are necessary to achieve policy objectives. When presented in an understandable format, data becomes a powerful tool that enables policymakers to address challenges and drive progress in education systems. This underscores the importance of investing in robust data systems and ensuring data is both accessible and actionable for all stakeholders.

1.1. The education data cycle

An education data ecosystem encompasses four major interconnected components that work together to support evidence-based decision-making in education: data availability including production, reporting and sharing, analysis, and finally use **(Figure 1.1)**.

Figure 1.1.

The four components of the education data cycle



Data availability and production

Data production involves the collection of information from diverse sources - such as learning assessments, administrative systems, and surveys – that will be discussed more in detail in the following sections. For good quality data to be available, it must be produced regularly and in alignment with established standards.

Data reporting and sharing

Once data is produced, it needs to be reported and shared effectively. This involves compiling, standardizing, and disseminating data to national, regional, and global stakeholders in formats that are easy to interpret and use. Transparent and timely reporting ensures that all stakeholders, including policymakers, educators, and international organizations, have access to reliable data of good quality. Data sharing also requires adherence to privacy and security standards to protect sensitive information. Robust reporting frameworks, such as those aligned with SDG 4 indicators, are essential to ensure that data is comparable across countries and over time.

Data analysis

This component involves interpreting the data to derive insights, identify trends, and evaluate outcomes. High-quality analysis requires technical expertise, analytical tools, and adherence to methodological standards. By transforming data into actionable information, analysis supports the identification of achievements and challenges, diagnosis of their drivers, and assessment of policy impacts. Effective analysis also involves examining equity dimensions, ensuring that data sheds light on disparities across different populations and regions.

Data use

The ultimate goal of an education data ecosystem is that high quality and timely data is put to use by education practitioners, policy analysts, advocates and other stakeholders for the improvement of learning of all children. Data use ensures that insights derived from analysis inform policy and programme development, resource allocation, planning and implementation. For data to be used effectively, it must be presented in a way that is accessible and understandable to decision-makers. Clear communication of findings through dashboards, reports, and visualizations empowers policymakers, educators, and other stakeholders to act on evidence, prioritize interventions, and address gaps.

Together, these components create a cycle where data informs decisions, leading to better educational outcomes, which in turn necessitate further data production and refinement. A well-functioning education data ecosystem relies on continuous investment, collaboration, and commitment from all stakeholders. To be able to achieve both national and global SDG 4 targets, it is important to effectively leverage this ecosystem.

1.2. The education data ecosystem

Education data is critical for understanding and informing policy decisions to improve education outcomes. The information falls mainly within the purview of education ministries, whose responsibilities typically include tracking student enrollment, assessing teacher qualifications, and monitoring school infrastructure. Other sources also contribute to the understanding of the functioning of education systems. Ministries of Finance, for example, manage some of the data on education expenditure, providing insights into budget allocation and expenditure. National statistical agencies conduct surveys or censuses that complement data from administrative records. In particular, statistical surveys generally collect information on individual and household background characteristics that facilitate disaggregation of education indicators by sex, location, income or wealth, ethnicity, language and disability (as well as the intersection of these characteristics). Such information helps identify differences in educational opportunities and outcomes among various social and economic groups, which can provides insights into policy design and implementation.

Below is an overview of the primary sources of education data, with each providing distinctive information that will be discussed in more detail in subsequent sections:

1. **Learning assessments** measure specific learning outcomes at particular ages or grades, often aligned with national policy goals. They encompass national school-based assessments, as well as cross-national (either regional or global) initiatives that use common frameworks and procedures to yield comparable data. Aside from school-based assessments, data can also be collected from household-based assessments. For instance, skills of adult populations are often assessed in household-based surveys (ICT, literacy, etc.). Beyond cognitive outcomes, learning assessments can also capture non-cognitive information, such as on home language, school infrastructure, student experiences with bullying, and teacher professional development.

2. Administrative data is usually available from Educational Management Information Systems (EMIS) used by ministries of education for management and planning purposes. Typically updated on an annual basis, EMIS ideally covers all educational paths and levels, from early childhood education (ECE) and basic/ secondary general education to higher education and technical and vocational education and training (TVET). Much of international monitoring of previous global development agendas (Education for All and the Millennium Development Goals) relied on administrative data from national EMIS, produced by countries and compiled by international organizations. At present, administrative data on some issues, such as school feeding programmes and teachers' salaries, is usually available from non-EMIS sources in education ministries. However, such information should ideally be integrated with the EMIS.

3. Survey data: Household surveys, Labour Force Surveys, and population censuses are important sourcse of information on educational access, participation, completion and attainment, as well as literacy and numeracy. Household surveys differ in coverage, frequency, objectives and questionnaire design. In contrast to administrative data, they are collected less frequently, and by a variety of organizations and countries. Household survey data, usually found outside of ministries of education, should ideally be linked to EMIS. Surveys are particularly useful for gathering information on education indicators not easily captured by administrative data. Examples include early childhood care and education; non-formal education and training (assessed more easily from users than dispersed service providers); selected skills of population, such as ICT or literacy (best assessed on a sampling basis); and household education spending (as the household is the source of information).

4. Expenditure data encompasses information on income and expenditure from various sources, including government spending on education. It commonly includes data on the construction and maintenance of schools, teacher salaries and household spending on education (e.g., supplies, transport and other costs). As is the case with other administrative data, some expenditure data (e.g., school feeding programmes and teacher salaries) may exist in non-EMIS sources within ministries. However, such data should ideally be integrated with EMIS.

5. Review and Monitoring. Although not initially included when considering the data cycle, review and monitoring are crucial components anchored in the United Nations Secretary-General's (UNSG) vision on the SDG monitoring framework. Data is crucial for making good education policies and ensuring resources are used effectively. Making data accessible and usable is key. Publishing important data like student/teacher numbers and spending increases transparency and accountability. A good practice is to create education plans with specific, measurable targets so everyone understands the commitment and shares responsibility for success. Regularly checking progress against these goals helps improve education and allocate resources efficiently. Monitoring helps identify problems like achievement gaps so solutions can be implemented quickly. In the ever-changing education landscape, consistent review and monitoring are essential for keeping education systems relevant and responsive to student and societal needs

By effectively leveraging and harmonizing these diverse data sources, countries can generate more accurate, comprehensive, and actionable insights to inform education policy and improve outcomes. Building capacity and fostering collaboration among data producers and users are essential for successfully integrating these various sources of data and overcoming associated challenges.

1.3. Fully leveraging the education data ecosystem

The effective utilization of the education data ecosystem necessitates a comprehensive understanding of all its constituent elements, including data production, reporting mechanisms, analytical processes, and ultimate application. The integration of disparate data sources to construct a coherent picture and address informational gaps is essential for generating actionable insights that inform policy design and implementation. While this integration presents complexities, its potential to drive evidence-based decision-making and subsequently improve educational outcomes renders it indispensable for addressing the sector's most pressing challenges.

Policymakers and education practitioners must fully leverage the potential of the entire education data ecosystem, utilizing all available data sources. Statisticians are increasingly tasked with incorporating multiple data sources or types in the estimation of key indicators. The capacity to provide value-added analysis by combining data sources and linking different databases through common identifiers is essential for the generation of high-quality data. It is only through these iterative processes that end-users, including policymakers, can fully realize the substantial value that data offers in addressing major challenges within the education sector.

Integrated data tools, such as a comprehensive dashboard, can assist policymakers, particularly ministers of education, navigate and consolidate data from various origins. This type of dashboard would empower them to make informed decisions by providing a holistic and integrated view of the education sector.

Below are a few examples that illustrate how different data sources can be integrated to answer critical policy questions:

- **Do overcrowded classrooms affect learning outcomes?**
  The student-to-classroom ratios are calculated based on enrollment and number of classrooms (from administrative data). By analyzing these ratios alongside student performance or learning outcomes data (from learning assessments), policymakers can determine whether a correlation exists between overcrowding and lower learning outcomes.

- **What policies can improve student retention?**
  Household surveys provide socioeconomic and demographic data that can reveal characteristics of students at risk of dropping out, such as children from low-income families or migrant communities. For example, if data shows a high proportion of migrant students or students from low socio-economic backgrounds in a district, targeted interventions like deploying bilingual teachers or offering school meal programmes respectively can be implemented to address barriers and improve retention.

- **How can resources be allocated efficiently to schools and students with the greatest needs?**
  Financial data on education expenditure can be combined with administrative records on school enrollment and socioeconomic data from surveys to identify areas of greatest need. This enables policymakers to direct resources toward underfunded schools or disadvantaged student populations effectively.

- **How can spatial data help identify hard-to-reach students?**
  Spatial data from Geographic Information Systems (GIS) can be combined with administrative enrollment data to locate underserved regions. This information can then inform infrastructure improvements, such as building new schools or transportation networks, to increase access to education for remote or marginalized populations.

2. The SDG 4 indicator framework

The statistical capacity of most countries had been put to the test by the ambitious scope of the global education goals. The 2030 Agenda for Sustainable Development puts emphasis on equity and quality of education and the SDGs are more comprehensive than the MDGs. The unprecedented breadth and depth of the SDGs require more data from a wider range of sources than before. These sources include administrative data, financial data, censuses, household surveys as well as national, regional and international learning assessments. Meeting these data requirements also necessitates increased cooperation among different national ministries, agencies and other data custodians to comprehensively address SDG 4, which spans from early childhood care and education to higher education and lifelong learning. Furthermore, data from other sectors, such as health, women's affairs and labour, are required for education related indicators in other SDGs (UNESCO, 2016).

Expanding a country's data collection and reporting is a crucial first step toward producing cross nationally comparable indicators. But it is not sufficient on its own. An indispensable step is ensuring the quality of the data according to international standards. Therefore, building the statistical foundation for effectively monitoring progress towards the education goal and targets must prioritize the production of high-quality data.

This chapter starts by presenting the SDG4 framework and the coverage of global and thematic indicators. It then clarifies how reporting on SDG4 requires multiple sources, with detailed examples of out-of-school and completion rates models. Finally, the chapter focuses on national SDG4 benchmarks and the commitments made at the Transforming Education Summit.

2.1 SDG 4 Global and thematic indicators

The SDG4 indicator framework includes global indicators and thematic indicators, both of which are designed to facilitate cross-national monitoring of progress towards the targets under the goal. Global indicators are selected based on several criteria, including technical strength, feasibility, frequency of reporting, cross-national comparability, interpretability, and availability of data over time. While all countries are encouraged to report on both global and thematic indicators, they can choose the thematic indicators most relevant to their specific policy needs. International organizations then compile the available country data for cross-national comparisons and report on trends and levels of progress.

The SDG monitoring framework is implemented through custodian agencies, which are entities responsible for collecting data from countries under existing mandates and reporting mechanisms. They compile internationally comparable data across different statistical domains and support national statistical capacity development through promoting the adoption of and adherence to internationally agreed standards. The Inter-Agency and Expert Group on SDG indicators (IAEG-SDG), composed of Member States with regional and international agencies as observers, develops, refines and periodically revises the global indicator framework. For SDG 4, the UNESCO Institute for Statistics (UIS) is the sole custodian of seven and co-custodian of three global indicators (one in SDG 1). It also serves as the sole custodian for two global indicators in SDG 9 and co-custodian for one global indicator in SDG.

The Education Data and Statistics Commission (EDSC, formerly the Technical Cooperation Group on SDG 4 indicators), composed of 28 Member States, oversees the thematic indicator framework. EDSC makes recommendations and decides on actions to improve data quality and availability, as well as the design and development of methodologies. It is co-chaired by the directors of UIS and the Global Education Monitoring Report (GEMR), with UIS serving as its secretariat.

The SDG 4 monitoring framework currently includes 44 indicators, 12 of which are global indicators. Together, the global and thematic indicators ensure alignment between education targets and national priorities while maintaining cross-national comparability.

Global indicators address the key outcomes of each target, while thematic indicators act as reference indicators for monitoring progress at regional, national, and sub-national levels. The thematic indicators also offer a more comprehensive and nuanced view of potential policy levers by including different policy-based indicators, often in areas where direct measures are difficult to implement or underdeveloped. **Tables 2.1 and 2.2** show the relationships between targets, global and thematic indicators, and their underlying concepts.

Table 2.1.

Education targets, global and thematic indicators and key concepts

Targe	No. of indicators	Concepts
SDG Target 4		
4.1 Quality in primary and secondary education	2	Learning
4.1 Quality in primary and secondary education	2	Completion
4.1 Quality in primary and secondary education	1	Learning + completion
4.1 Quality in primary and secondary education	2	Participation
4.1 Quality in primary and secondary education	1	Provision
4.2 Access to quality early childhood development, care and pre-primary education	2	Readiness to learn
4.2 Access to quality early childhood development, care and pre-primary education	2	Participation
4.2 Access to quality early childhood development, care and pre-primary education	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	3	Skills
4.5 Elimination of gender disparities in education and ensuring equal access to all levels of education for the vulnerable	1	Equity across targets
4.5 Elimination of gender disparities in education and ensuring equal access to all levels of education for the vulnerable	2	Policy
4.5 Elimination of gender disparities in education and ensuring equal access to all levels of education for the vulnerable	3	Expenditure on education
4.6 Adult literacy and numeracy	2	Skills
4.7 Knowledge and skills needed to promote sustainable development	2	Policy

4.7 Knowledge and skills needed to promote sustainable development	2	Knowledge
4.7 Knowledge and skills needed to promote sustainable development	1	Provision
4.a Education facilities that provide safe, non-violent, inclusive and effective learning environments for all	1	Resources
4.a Education facilities that provide safe, non-violent, inclusive and effective learning environments for all	2	Environment
4.a Education facilities that provide safe, non-violent, inclusive and effective learning environments for all	1	Provision
4.b Expand globally the number of scholarships available to developing countries	1	Expenditure on education (ODA)
4.c Increased supply of qualified teachers	2	Qualified teachers
4.c Increased supply of qualified teachers	2	Trained teachers
4.c Increased supply of qualified teachers	2	Motivation
4.c Increased supply of qualified teachers	1	Support
Total	**44**	
SDG Target 1 (in relation to education)		
1.a Resources to provide means for developing countries to implement programmes and policies to end poverty in all its dimensions	1	Expenditure on education
SDG 4 – Education 2030 Framework for Action (FFA)		
Increase public spending on education and urge adherence to the international and regional benchmarks (allocate 4-6% of GDP and/or at least 15-20% of total public expenditure to education)	1	Expenditure on education

Source: UNESCO Institute for Statistics based on Education 2030 Framework For Action, 2016

Table 2.2.
Global and thematic indicators by concept with an expanded view of the education sector

Concept	Global indicators	Thematic indicators
Participation and completion	Participation in ECCE Participation of youths and adults Completion of primary and secondary education	Participation (all levels, including tertiary and TVET) Completion
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 Public policies promoting equity Provision of global citizenship and sustainable development education, HIV and sexuality education, greening education, school meals

Learning, readiness, skills, knowledge	Learning outcomes at primary and secondary levels Readiness: school readiness before primary school Skills: ICT, functional literacy and numeracy	Learning assessments administration Readiness: children/young people prepared for the future – a stimulating home learning environment Skills: literacy, digital literacy, attainment Knowledge: global citizenship and sustainability; environmental science and geoscience
Equity	Equity across targets	Resources for disadvantaged populations and least developed countries
School infrastructure and environment	School resources	School environment
Teachers	Training	Training and qualification Motivation Support
Expenditure on education	"Government expenditure on education (% of total expenditure/% of GDP) Volume of ODA flows"	Equity Expenditure per student by level and source Expenditure by source as % of GDP"

Source: UNESCO Institute for Statistics (UIS)

2.2 SDG 4 global indicators: Data coverage

The UNESCO Institute for Statistics (UIS) releases data twice a year, in September and February/March. The February/March data release finalizes the processing of data collected by UIS surveys in the previous reference year. Each release is a complex technical process that involves multiple data sources, including administrative data, surveys/censuses, learning assessments, and expenditure data, as well as contributions from multiple data producers.

Data coverage is a critical consideration for SDG monitoring. The Inter-agency and Expert Group on SDG Indicators (IAEG-SDGs), which is the inter-governmental body responsible for the development of the SDG monitoring framework, has set **specific criteria for the 2025 comprehensive review** of indicators. These criteria include:

- Having available data or a link to where the data can be located;
- Ensuring that data is available for at least 40% of countries and the population across the different regions where the indicator is relevant; and
- Including a plan to expand data coverage if it is currently below 50%.

The IAEG-SDGs has provided clear process guidelines and has custodian agencies with indicators below 40% coverage to present a data plan to reach 50%.
Table 2.3 provides a summary of the data coverage for SDG4 indicators. As can be seen, the coverage on average stands at 60% across 205 countries around the world, and for 64% of the population.

Table 2.3.
SDG 4 Indicators coverage by region

Region	Coverage SDG4 (% population)	Coverages SDG4 (% countries)	Number of countries in region
Central and Southern Asia	70	63	14
Eastern and South-Eastern Asia	61	63	18
Europe and Northern America	67	63	45
Latin America and the Caribbean	73	59	39
Northern Africa and Western Asia	60	63	24
Oceania	53	54	17
Sub-Saharan Africa	59	58	48
World	64	60	205

Source: UNESCO Institute for Statistics (UIS) database

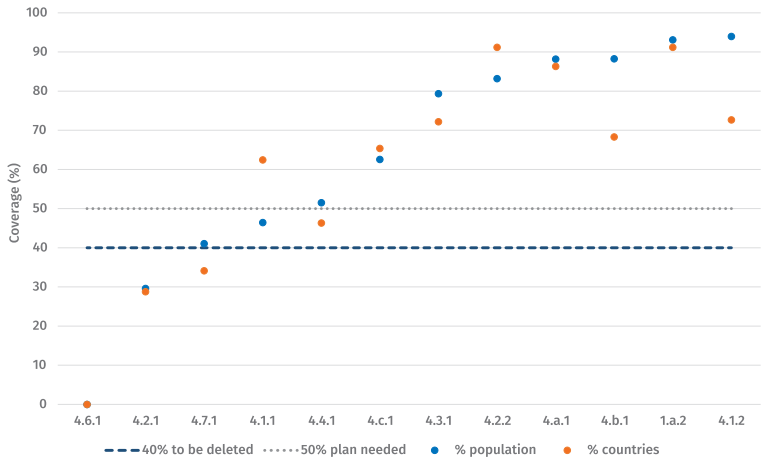
On the other hand, there are indicators with low coverage. **Figure 2.1** presents the population and country coverage for the 12 global SDG4 indicators. As can be seen, three global indicators have the lowest coverage in population terms:

- Children developmentally on track (4.2.1) at 30%, none of which is a high-income country.
- Functional literacy and numeracy proficiency (4.6.1) at 0%. Given very low coverage, the youth/adult literacy rate (indicator 4.6.2) was proposed as a replacement global indicator, as its coverage is high (87%), except in high-income countries (35%) where literacy rates are close to universal and therefore the indicator is less relevant.
- Extent to which global citizenship education and education for sustainable development are mainstreamed in policy, curricula, teacher education, and assessment (4.7.1).

Two of the 12 global indicators have relatively higher coverage that still falls below 50%, in terms of % population or % of countries:

- Minimum proficiency level in reading and mathematics (4.1.1);
- ICT skills (4.4.1).

Figure 2.1.
Population and country coverage of global indicators

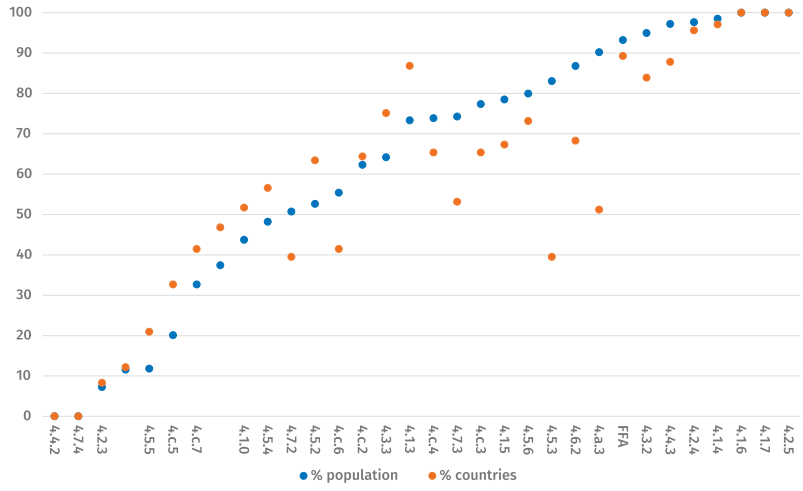


Source: UIS based on UIS database February 2025 and IAEG-SDG Report to the UNSC (2024)

2.3 SDG 4 thematic indicators: Data coverage

As mentioned previously, one of the criteria guiding the review of the SDG indicator framework is the data coverage. This criterion will determine the necessary actions, such as refinements or deletion from the monitoring framework. Specifically, for thematic indicators, data must be available for at least 30% of countries or the population. **Figure 2.2** shows the coverage [1] of SDG 4 thematic indicators as a percentage of population and as a percentage of countries. Annex 4 presents a regional breakdown of the coverage of SDG 4 thematic indicators.

Figure 2.2.
Coverage of SDG 4 thematic indicators



Source: UIS based on UIS database February 2025

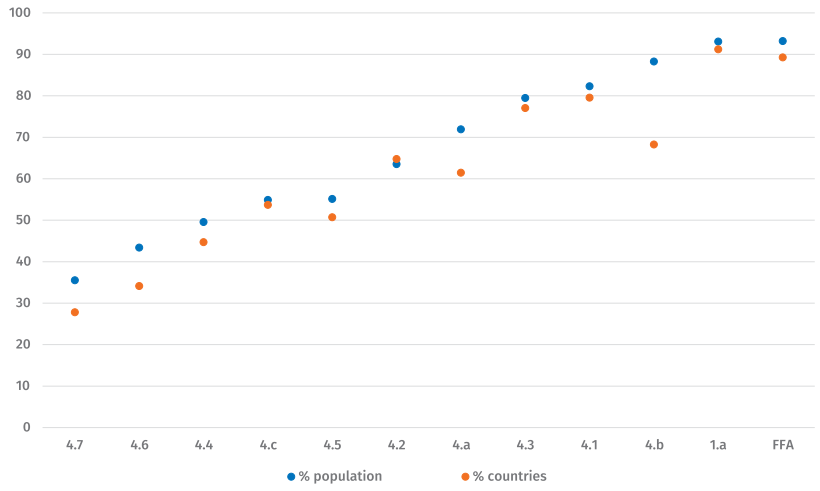
1 Coverage is defined as the availability of at least one data point in the last 4 years, for administrative data, or 5 years, for other data source.

2.4 SDG 4 targets: Data coverage

Figure 2.3 shows that coverage of SDG 4 targets varies significantly across both population and country metrics. For example, target 4.1, focusing on quality primary and secondary education, shows high coverage—82% of the global population and 80% of countries. Similarly, target 4.3 (affordable, quality higher education) and 4.b (scholarships) display robust coverage, with percentages reaching the upper 70s and 80s in both dimensions.

On the other hand, targets emphasizing sustainable development knowledge (4.7) and literacy (4.6) exhibit much lower coverage, falling below 45% for both population and country indicators. Middle-tier targets like 4.4 (skills for jobs), 4.c (qualified teachers), and 4.5 (gender equity) range between 50-55% in population and slightly lower in countries. Overall, while some targets show impressive coverage, others highlight significant gaps that still need addressing.

Figure 2.3.
Population and country coverage of targets



Source: UNESCO Institute for Statistics (UIS)

2.5 SDG 4 indicators need multiples sources to report

The production of international education statistics is a complex technical and political process that involves multiple data sources, such as administrative records, surveys/censuses, learning assessments, and expenditure data, as well as multiple data producers or donors. Various education indicators may draw on these multiple data sources. For instance, some indicators can be informed by multiple data donors utilizing the same data source, while others may rely on different sources **(Figure 2.4)**.

Education indicators can be calculated using a single data source or by integrating multiple data sources:

1. Single data source, multiple data points:
Some indicators can be reported using different data collection exercises by the same type of source. Differences in methodologies, objectives and circumstances in each specific data collection may affect the comparability of results. Hence, the need for careful analysis before reporting and establishing trends. For instance:

- Learning outcomes indicators, such as 4.1.1, can be reported using different assessments.
- Completion, out-of-school and literacy rates can be derived from different household surveys and population censuses.

2. Different type of data sources for the same indicator

Some indicators can be informed by different data sources. Some countries may choose to rely solely on one data source over another. For instance:

- The number and rates of out-of-school children can be estimated using both administrative data and household survey data.
- Teachers' professional development data could come from administrative records and learning assessments. In these cases, the indicator values are reported on separate lines with a clear mention of the source from which they were derived.

3. Combined sources to produce a given indicator

Certain indicators can only be produced by using data from multiple sources. For example:

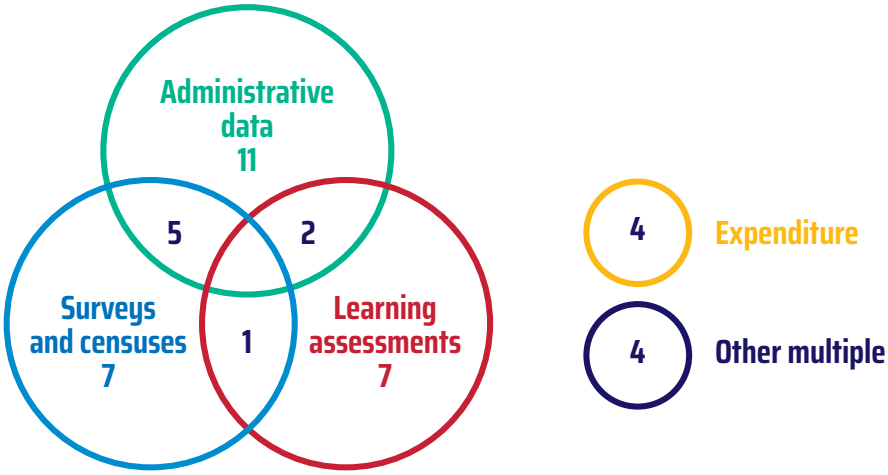
- The rate of out-of-school children combines enrollment data (administrative) with population estimates (survey or census).
- Expenditure per student requires enrollment data (administrative) and total education expenditure (financial data).

Scenarios like the ones presented in 1 and 2 calls for methods to combining data sources to monitor trends. The UIS and the Global Education Monitoring Report have made significant progress in this area by adopting Bayesian modelling estimates for both Completion rates (SDG 4.1.2) and Out-of-School rates (SDG4.1.4). This approach not only provides consistent and smoothing trend data but also fills in missing years.

To produce internationally comparable education indicators, the UIS uses various sources of data **(Figure 2.4)**. These data sources differ in their coverage, timing and methods of collection (see **table A.3** in the annex).

Figure 2.4.

Distribution of SDG 4 global and thematic indicators, by potential data source



2.6 Bayesian modelling estimates for two flagship indicators

Multiple data sources have been recently used to estimate two education indicators: the completion rate (SDG 4.1.2) and the out-of-school rate (SDG 4.1.4).

A completion rate model

The Inter-agency and Expert Group on SDG Indicators adopted the completion rate at three levels of education (primary, lower secondary and upper secondary) as SDG global indicator 4.1.2. This was one of only six successful proposals out of more than 200 made during the 2020 Comprehensive Review of the SDG Monitoring Framework. Indicator 4.1.2 is defined as the 'percentage of a cohort of children or young people aged 3–5 years above the intended age for the last grade of each level of education who have completed that grade'. The completion rate is a 'flow' measure of attainment, recognizing late enrolment and high repetition in many poorer countries, which leads many children to reach the end of each education cycle several years after the official graduation age.

Combining multiple survey data sources can address issues such as infrequent survey cycles (every three to five years) and a variety of sampling and non-sampling errors that generate conflicting information between different surveys in the same country. However, surveys also have advantages over administrative data, such as better recording of age information and universal coverage of education programmes. Surveys also collect retrospective information, which can be used to reconstruct the historical completion rates of older cohorts, not just limiting the data to the most recent cohort.

The developed model is a Bayesian hierarchical model inspired by the approach used to estimate health indicators but adapted to the education context **(Dharamshi et al., 2022)**. It estimates an underlying trend in target values and shares information on parameter scaling across countries. Late completion is explicitly modelled by specifying the magnitude of the delay as a function of age. Age misreporting concerns are also addressed. These adjustments allow the model to consolidate survey data into a smooth underlying completion rate trend from which the estimated true annual completion rates for each country can be extracted. By addressing the various data quality concerns associated with survey data, these estimates are less sensitive to individual surveys, the year in which they were conducted, and the type of survey that happens to be the latest available in a given country.

Point estimates continue to be reported for combinations of individual countries and survey years in the UIS database. However, the UIS also provides the model estimates alongside these point estimates. The Technical Cooperation Group (TCG) on SDG 4 Indicators has approved the use of the model estimates for regional and global aggregates for the SDG database.

The completion rate is the survey-based counterpart of an administrative data–based indicator, the gross intake rate to the last grade of school. A potential future extension of the model could be to combine survey and administrative data, similar to the out-of-school rate model, which is presented next.

An out-of-school rate model

The out-of-school rate is defined as the 'proportion of children and young people in the official age range for the given level of education who are not enrolled in pre-primary, primary, secondary or higher levels of education' **(UIS, 2021)**. This indicator was a flagship measure under the Education for All agenda and the Millennium Development Goals from 2000 to 2015. The need for a methodology that combines data sources to estimate out-of-school rates was recognized 20 years ago, when it was acknowledged that 'some sort of composite approach may be needed for estimating time series and producing estimates for the most recent year' **(UIS and UNICEF, 2005)**.

In the absence of such a 'composite approach', the calculation of out-of-school rates has relied on enrolment records from school censuses. However, using administrative data has three challenges in poorer countries with high out-of-school rates. First, enrolment records are often incomplete, inaccurate or missing altogether. Second, estimates need to combine enrolment counts with a measure of the population, which comes from a different and often inconsistent source. The quality of single-age population estimates, required to calculate out-of-school rates accurately, is often low, leading to jumps in the indicator time series – and sometimes more children being recorded as enrolled than the number of children of that age group. Third, with low birth registration rates, the capacity of schools to record student age accurately is limited.

In recent years, many of these countries have carried out household surveys which, despite their weaknesses, can help fill gaps and address challenges related to age and population. A Bayesian hierarchical cohort-based model was accordingly developed to estimate out-of-school rates using multiple data sources **(UIS and GEM Report, 2022)**. The model mirrors the natural progression of students through the school cycle. It reconciles data from both administrative and survey sources, recognizing the differences in the nature and generation of these data types, while sharing information about bias and variance across countries.

The model introduces several key ideas. First, it uses a cohort approach to link out-of-school rates, similar to demographic modelling of population processes. Due to lack of reliable data, the risks of late entry, dropout, repetition and other relevant education transitions are not estimated. Instead, net grade-to-grade changes are estimated flexibly to smooth the underlying out-of-school rate cohort curves. Second, the model accepts cases where there are more children in school than children of a particular age, but at constrains out-of-school rates to be between 0 and 100% to allow such information to be used. Third, the model shifts the focus from out-of-school rates by education level to out-of-school rates by age, as students enter and exit school at every age.

The results of this model were reported for the first time in September 2022, including for many countries that have not had administrative data on out-of-school rates for many years. While administrative data estimates remain the officially reported national data in the UIS database, the UIS also provides model estimates for individual countries. Model estimates are the preferred source for regional and global aggregates.

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Visualizing the completion and out-of-school rate model estimates

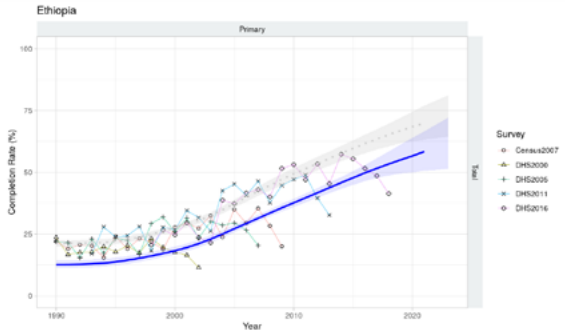
Results of both models are available on the VIEW website, which is maintained by the Global Education Monitoring Report and the UNESCO Institute for Statistics. This site is updated twice a year and visualizes the input data, allowing for a closer inspection of the statistical issues being addressed.

For the completion rate, the visualization highlights the challenge of late enrolment. A large number of children complete each level of education even 3 to 5 years beyond the intended age for the last grade. The model, in fact, estimates not only the official completion rate but also an 'ultimate' completion rate, which includes those who finish school up to 8 years late **(Figure 2.5a)**.

For the out-of-school rate, the visualization highlights each source of data with a separate color, which helps identify the source of discrepancies **(Figure 2.5b)**.

Figure 2.5.
Visualization of input data and model estimates for two education indicators

a. Primary completion rate, Ethiopia



b. Out-of-school rate, by age group and sex, Ethiopia

Source: https://education-estimates.org/

2.7 National SDG4 benchmarks

Global development agendas express the aspirations of the international community to accelerate progress towards fulfilling human rights and addressing common challenges. However, they have historically been criticized for implicitly assuming that all countries can achieve the same objectives, despite starting from very different points.

Anticipating the need for a different approach, the UN Secretary-General's 2014 synthesis report stressed the importance of countries "embracing a culture of shared responsibility in order to ensure that promises made become actions delivered." This approach is based on "agreed universal norms, global commitments, shared rules and evidence, collective action and benchmarking for progress". The report called for "a new paradigm of accountability … built on national ownership, broad participation and full transparency", describing a process that would be:

- "effective": aligned with the 2030 Agenda for Sustainable Development;
- "efficient": voluntary, state-led and participatory, using existing processes;
- "evidence-based": using the SDG monitoring indicators;
- "universal": multitiered, applying at national, regional and global levels.

The last point is particularly important. Development agendas tend to exist in parallel at different levels. National strategies often make superficial references to international goals. Their monitoring frameworks, if they have one, often use different indicators to those agreed globally. In turn, global agendas often appear to neglect the existence of regional agendas and the opportunities they offer for policy dialogue among peers. The synthesis report therefore envisaged a review process at three levels: national, regional and global:

- A "country-led, national component for accountability … built on existing national and local mechanisms and processes", which "would establish benchmarks … based upon globally harmonized formats";
- A "regional component for peer reviewing … undertaken by existing mechanisms … to generate solutions and mutual support" quoting examples such as the African Union's Africa Peer Review Mechanism process;
- A "global component for knowledge-sharing … under the auspices of the High-Level Political Forum on Sustainable Development" (United Nations, 2014).

The education sector has followed in the footsteps of this approach. Paragraph 28 of the Education 2030 Framework for Action, which is the roadmap for achievement of SDG 4, reflects concerns about fairness, responsibility and accountability in the global agenda:

> *The targets of SDG4-Education 2030 are specific and measurable, and contribute directly to achieving the overarching goal. … This requires establishing appropriate intermediate benchmarks (e.g. for 2020 and 2025) through an inclusive process, with full transparency and accountability, engaging all partners so there is country ownership and common understanding. Intermediate benchmarks can be set for each target to serve as quantitative goalposts for review of global progress vis-à-vis the longer-term goals. Such benchmarks should build on existing reporting mechanisms, as appropriate. Intermediate benchmarks are indispensable for addressing the accountability deficit associated with longer-term targets (UNESCO, 2015).*

This paragraph of the Framework for Action outlines key elements that should characterize a benchmarking approach in education :

- "strive for accelerated progress": Benchmarks should be set at a level that entails a progress faster than what would have been achieved without extra effort (or "business as usual");
- "taking into account different national realities, capacities and levels of development": Benchmarks should be set relative to countries' starting points;
- "translate global targets into achievable national targets based on … national … plans": Benchmarks for SDG 4 should be part of national sector planning, not an external process;
- "establishing appropriate intermediate benchmarks (e.g. for 2020 and 2025)": Benchmarks would be set for at least two points in time;
- "quantitative goalposts for review of global progress vis-à-vis the longer term goals": National benchmarks should be aggregated to see how they stack up relative to SDG 4;
- "drive change, supported by effective multistakeholder partnerships" and "indispensable for addressing the accountability deficit associated with longer-term targets": Benchmarks are expected to serve a twin purpose, i.e. serve as a mechanism for both peer learning and accountability to inject a sense of purpose in the international education development agenda.

To summarize, national SDG 4 benchmarks aim to serve multiple objectives:

- **Contextualize monitoring of progress:** The SDG 4 targets set a global aspiration but do not distinguish between countries at different stages of educational development. Benchmarks recognize that each country has a different starting point but also that all countries together have historically progressed at a certain pace. The benchmarking process challenges countries to commit to progress faster than if they followed these past trends.
- **Make countries accountable for their commitments:** The national SDG 4 benchmarking process calls on countries to publicly state what contribution they are prepared to make to the global goal. This process represents an adaptation to education of the "nationally determined contributions" approach used in climate change discussions to rally country action in recent years .
- **Link national, regional and global education agendas:** Countries have been asked to select national SDG 4 benchmarks that correspond to the targets they have set in their national education sector plans. Countries which are members of regional organizations have also been invited to align their benchmarks to any regional targets to which they are committed. The purpose is to ensure coherence and mutual understanding between these three levels to reduce duplication, improve transparency and facilitate policy dialogue.
- **Strengthen country ownership:** There is a tendency, often among international organizations, to propose or process places country ownership of education targets at the centre.
- **Focus attention on data gaps:** The SDG 4 monitoring framework aims to motivate countries to consider a wider range of important results and call for using a broader set of data sources than before 2015. However, not every country can report on all indicators nor are all indicators relevant to all countries. By contrast, the benchmark indicators represent a key set that every education system needs for management purposes and for which there should be no data gaps, helping focus national and international actions to fill them.

- **Strengthen national planning processes:** Despite the proliferation of national education sector plans, some do not have clear targets, while others do not follow the SDG 4 indicator definitions. The national SDG 4 benchmarking process aims to encourage countries to include targets in their plans and to align those targets with global indicator definitions.
- **Promote peer dialogue:** The national SDG 4 benchmarking process is just a means to prompt exchanges on challenges and good practices, promote mutual learning, and provide the evidence based for national policy reforms and international collective initiatives.

For all of these reasons, the benchmarking process is a key strategy that supports the data and monitoring function in the reformed global education cooperation mechanism.

Table 2.4.
SDG 4 benchmark indicators

Thematic area	Indicator			Disaggregation
Early childhood	Global indicator 4.2.2	Participation rate one year before primary	1	
Basic education	Thematic indicator 4.1.4	Out-of-school rate	3	b. Primary school age c. Lower secondary school age d. Upper secondary school age
	Global indicator 4.1.2	Completion rate	3	b. Primary c. Lower secondary d. Upper secondary
	Related to global indicator 4.5.1	Gender gap, completion rate in upper secondary	1	
	Global indicator 4.1.1	Minimum learning proficiency in (i) reading and (ii) mathematics	6	a. Early primary grades b. End of primary c. End of lower secondary
Digitalization	Global indicator 4.a.1	Schools connected to the internet	3	b. Primary c. Lower secondary d. Upper secondary
Quality	Global indicator 4.c.1	Trained teachers	4	a. Pre-primary b. Primary c. Lower secondary d. Upper secondary
Financing	Global indicator 1.a.2 and Education 2030 benchmarks	Education expenditure	2	a. As share of total public expenditure b. As share of gross domestic product

Source: SDG 4 scorecard progress report on national benchmarks: focus on teachers

Overall, 8 in 10 countries have set at least one national SDG 4 benchmark[2]:

- 70% of countries directly submitted national benchmark values. 9% of countries are Caribbean Community (CARICOM), South Asian Association for Regional Cooperation (SAARC) and European Union (EU) member states that committed to benchmarks agreed through their respective regional processes.
- 21% of countries did not submit any benchmark values. These were almost equally split between:
  - Countries for which an analysis of national plans revealed at least some targets for benchmark indicators
  - Countries for which no national targets could be identified.

The benchmarks can be analyzed by submissions for each indicator. The indicators with the highest number of country submissions, either directly or through participation in a regional mechanism, are the early childhood education participation rate (4.2.2) at 72% and the upper secondary completion rate (4.1.2d) at 70%. About 60% of countries have submitted benchmarks for out-of-school rates (4.1.4) and trained teachers (4.c.1), while about 50% have submitted benchmarks for minimum learning proficiency in reading and mathematics (4.1.1). The lowest submission rates, with about one in every three countries, are observed for the gender gap in upper secondary completion and the new benchmark indicator on school internet connectivity (4.a.1) (. All countries have agreed on minimum targets for the public expenditure indicators in the Education 2030 Framework for Action, which are 15% of total public expenditure and 4% of GDP.

Progress towards benchmarks

It will not be until 2027 at the earliest that the achievement of the 2025 benchmarks can be verified, once 2025 data are available for all countries. In the meantime, the focus will be on the probability of countries reaching their benchmarks. Countries have been classified into six categories based on the speed of their recent progress and the range of progress rates observed historically (2000–15). Four categories capture the speed of progress since 2010 or 2015 and its implications for the probability of achieving the benchmark, while two categories recognize the non-availability of data (**Table 2.5**). For countries without national benchmarks (either submitted or extracted from national sector plans), progress is evaluated against the feasible benchmarks. These benchmarks were estimated for each indicator based on the average rate of progress of the top 25% fastest-improving countries in 2000–15 and vary by the indicator's starting value.

Table 2.5.

Country classification of progress relative to national SDG 4 benchmarks

Category		Description
Fast progress		>75% probability that 2025 national benchmark will be achieved given the latest value (including countries which have already achieved the benchmark or the value exceeds 95%)
Average progress		25%–75% probability that 2025 national benchmark will be achieved given the latest value
Slow progress		<25% probability that 2025 national benchmarks will be achieved given the latest value
No progress		Negative progress
No data for trend		
No data		

2 For more information, refer to the 2024 Scorecard publication - SDG 4 Scorecard progress report on national benchmarks: focus on teachers.

3. UIS support to member states

3.1. Introduction

Delivering accelerated action to meet the Sustainable Development Goals (SDGs) requires high-quality, timely, disaggregated and open data and statistics. Data drives informed decision-making, supports the development of effective policies to address major global education challenges, and yields significant economic and social benefits, including progress towards SDG4 which aims for inclusive and equitable education by 2030.

As the custodian of international education statistics for the SDG 4-Education 2030 Agenda, the UIS is committed to producing high-quality data to assess the progress towards international education goals while guiding and advising Member States:

- To develop national statistical systems, in order to produce fit-for-purpose data and statistics;
- To provide authoritative regional and global data and statistics to address regional and emerging policy needs promptly.

Significant data gaps and methodological challenges persist regarding the global and thematic indicators for education as required by the ambitious policy agenda. UIS analyses reveal that only about half of the data required to monitor SDG 4 is currently produced, reflecting a core challenge: systematically strengthening education data production at the national level. Success depends on establishing and strengthening the production of education data of the required quality in a systematic and sustainable manner at the country level. Solid understanding of countries' diverse starting points is pivotal to building a comprehensive approach to sustainable production of timely and quality education data. In particular, it is essential to help develop strategies to assist non-reporting countries and to improve the response rates in data collection. While the global benefit of accessible education indicators is widely recognized, many Member States fail to submit their data on time, or they send incomplete data, reducing the potential for improving the analysis of educational policies and their effect on development.

This chapter examines the critical role of UIS in addressing these challenges and outlines strategies to enhance education data ecosystems worldwide. More specifically, the next section provides an overview of the structural, institutional, and resource-related obstacles that impede consistent data production at the national level. This is followed by a clarification of the differences between data existence and its official reporting, highlighting gaps and their implications for global monitoring. The chapter then delves into a detailed examination of specific bottlenecks in data collection and reporting, accompanied by UIS actions to address them. The chapter concludes by presenting a transformative approach to strengthening national data ecosystems, enhancing reporting, improving data use, and tracking education finance through targeted initiatives and tools.

3.2 Country bottlenecks to produce education data

A primary obstacle for the international community is understanding whether education data is collected at the national level and, if it is collected, how good the quality is. Instead of starting from scratch, capacity development can leverage existing resources, infrastructure, and networks. This approach saves time, effort and resources, while enabling more focused interventions.

However, delays in data reporting by countries vary widely across countries, necessitating a deeper understanding of the proximate and root causes. Structural barriers at the macro level include:

Low use of data in decision-making: When data is underused by national stakeholders, countries often deprioritize its collection and delivery. Under this condition, reporting data to UIS becomes an obligation, rather than an activity that is directly relevant to better education management.

Lack of feedback loops at the school level: Schools send data upward, but receive little actionable feedback to improve planning, management, or performance. In contexts with a weak data culture, schools do not have enough incentives to demand or use data, even if the data is useful. Instead, school governance is guided by empirical knowledge that does not require corroboration through data. Continuous UIS-assisted training in data collection and use is essential in these cases.

Negative incentives for producing SDG4 indicators. Many countries report a mismatch between the limited data and indicators that they produce and the extensive data and indicators requested by UIS. For instance, from the countries' perspective, the cost of producing data falls on the country, while benefits accrue externally. This perception reduces interest in comprehensive data reporting. For instance, policymaking in many countries is geared towards solving politically sensitive problems under time constraints, such as unpaid teachers, low literacy scores, or student retention after grade 6. The number of indicators required for making operational and pedagogical decisions in alignment with such issues is relatively small. On the other hand, UIS maintains a much more extensive list of indicators which might be relevant to countries but are not used by countries. Examples include indicators measuring student inflows, e.g. survival rate. However, UIS has struggled to articulate the policymaking value of such indicators to countries.

Institutional silos: In some countries, data fragmentation across educational sectors stems from poor coordination across institutions. Take Technical and Vocational Education and Training (TVET) as an example. The TVET sector is typically not well integrated with the rest of the education system. Some countries already produce massive amounts of data but the data are not reported to the UIS, due to isolated data management by separate divisions/ units/departments.

Lack of human resources: Low- and lower-middle-income countries often lack the technical staff to compile data and produce good quality indicators consistently.

Disruptions of data production: Natural disasters, conflicts, wars and social and political instability disrupt data production. In crisis-affected countries, UIS may need to rely on third-parties to collect and deliver data while immediate priorities are addressed.

Problems and incentives vary. Low-income countries often find themselves using short-term solutions to solve their problems, because the gravity of a problem is what defines the operational priority of the education sector. As a corollary, once a problem is addressed, another problem moves to the front of the line. The key issue here is that some non-reporting countries may be always in a non-reporting situation because of the gravity of the problems they face. In these cases, UIS may be forced to use third-party firms that can collect and deliver data to UIS while the country solves its more immediate problems.

High costs of specific indicators. Tracking the skills of teachers and monitoring Out-Of-School Children (OOSC) are two examples. Tracking teacher skills can be prohibitively expensive for low-income countries. This is because assessing teacher skills requires advanced statistical capacity to analyze classroom-level data on what skills teachers use after training, and which skills are more effective. Monitoring OOSC on a regular basis in a manner that allows for management can also be very expensive because out-of-school children are largely invisible in the national education data systems and requires a broader collaboration and coordination at the country level. However, the occasional monitoring of OOSC based on household surveys is cost-effective alternative, although sporadic.
In general, complete reporting of education data correlates strongly with countries' income levels. Higher-income submit more complete data. However, even among these, there is an element of randomness, where a data point in

a given year may appear between two non-reporting years, or two blank years flank one data point. This element of randomness implies that although a country may have a data system in place, there are disruptions that lead to non-systemic failures in data reporting.

3.3 Data reporting and availability

The lack of **data reporting** does not necessarily preclude the existence of data at the national level. The distinction between **data availability** (whether data exists in any form, such as internal records) and data reporting (whether it is officially shared with entities like UIS) is key for pinpointing problems, diagnosing root causes and designing solutions.

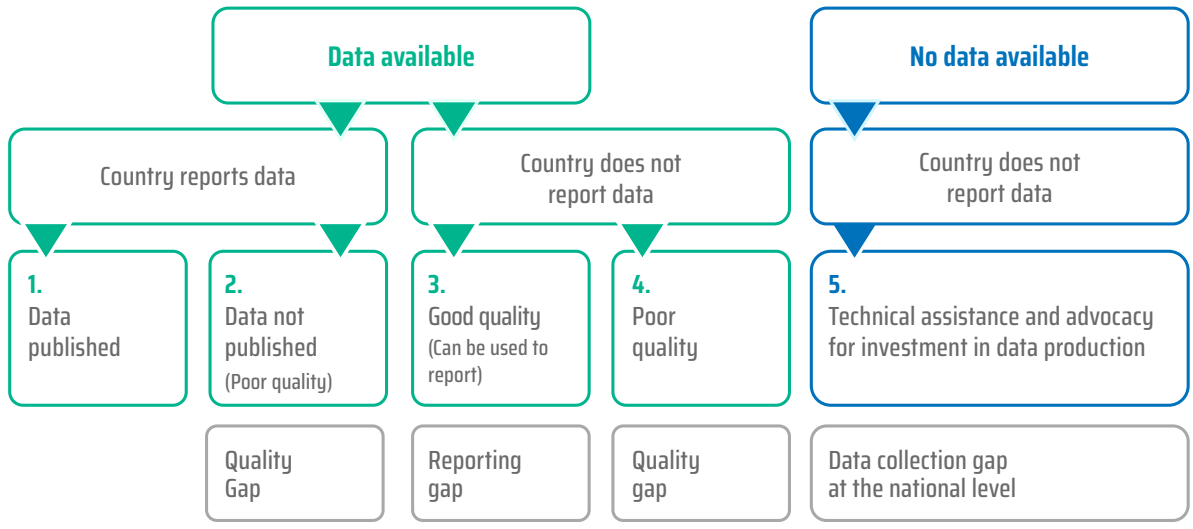
Data Availability: Refers to whether data exists in any form, e.g. internal records, surveys, or other sources, regardless of whether it is officially reported or not. Example: A country may collect learning outcome data but keep it in internal government reports without publishing it.

Data Reporting: Refers to whether the available data is officially shared with the public, international organizations, or stakeholders. Even if data exists, it might not be reported due to poor quality, lack of standards, or political reasons. Example: A country collects high-quality statistics on learning outcomes or population. However, the country does not submit them to the UIS, creating a reporting gap.

Figure 3.1 illustrates the dynamics about data availability and data reporting, adding a quality dimension. Scenarios include:

1. Countries report data to UIS but with data deemed unpublishable due to quality constraints.
2. Countries with available data not reported – split into those with useable, high-quality data (unreported due to lack of interests or inexperience) and those with poor quality data
3. Countries lacking data entirely, requiring technical assistance and advocacy for investment in data production

Figure 3.1.
Unpacking national unpublished data



Source: UNESCO Institute for Statistics (UIS)

3.4 Constraints in data production and reporting

Countries face two types of bottlenecks in data production and reporting (**Table 3.1 and 3.2**). The first type of bottlenecks is related to data collection while the second is related to data reporting.

To address challenges related to data collection at the national level, UIS advocates for investments and partnerships to improve data systems, provides technical assistance and capacity building to demonstrate the importance of data and its use, and promotes inter-agency coordination and transparency.

To address challenges hindered by insufficient staff, inadequate training, and underdeveloped reporting systems, and exacerbated by fragmented decision-making and a lack of understanding of the benefits of internationally comparable data, UIS works to reduce reporting burdens by streamlining data points and accepting national definitions when appropriate. It also builds capacity to highlight the value of international comparisons, advocates for country involvement in indicator design to ensure relevance, and focuses on essential indicators while supporting targeted training.

Overall, UIS emphasizes the need for strategic resource allocation, enhanced technical support, and collaboration among stakeholders to strengthen data ecosystems and improve reporting systems.

Table 3.1.
Country data collection bottlenecks

Issue	Description	UIS actions
Premise: Faced with limited resources, government leaders prioritize allocation of resources (expenditure / staff time) to data collection based on perceived value of the data, despite legal and international commitments.		
Insufficient resources	• EMIS does not collect data needed for certain indicators from (enough) schools. • Lacking investments in EMIS to improve quality of data. • Non-EMIS data collection scattered or inconsistent (e.g.: learning assessments, household surveys, etc.)	• Better understand the problem, advocacy, and promote partnership.
Unrealized value of data (i.e.: resources possible but data collection not demanded)	• Government leaders undervalue data for policy-making. • Fragmented decision-making across multiple government entities • Lack of incentives / regulation / culture of transparency .	• Technical assistance / capacity building on use of data. • Advocate for coordination across government agencies. • Advocate for institutional changes to promote transparency.

Source: UNESCO Institute for Statistics (UIS)

Table 3.2.
Country reporting bottlenecks

Premise: Faced with limited resources, government leaders prioritizes allocation of resources (expenditure / staff time) to report data already collected based on their perceived value of having internationally comparable data, despite legal and international commitments.

Insufficient resources	• Lack of staff available to collect data from various government sources, adjust and make calculations needed for reporting. • Lack of staff or high turnover. • Lack of investment in staff expertise / capacity building / training. • Lack of investment in setting up data reporting systems to help automate work needed for UIS reporting.	• Reduce the cost of reporting to UIS by: Reducing the number of data points needed (e.g.: thematic data collection lower frequency) • Allowing national definitions to reduce reporting burden with minimum criteria. • UIS can use its own resources to collect data from publicly available alternative or Ministry sources (already doing this).
Unrealized value of data (i.e.: resources possible but data reporting not demanded)	• Government leaders undervalue data for comparing with and learning from other countries. • Decision making for data reporting to UIS split across different government entities preventing needed coordination by government. • Lack of incentives / legal framework / culture of transparency resulting in refusal to report / publicize data.	• Knowledge sharing / capacity building on use of internationally comparable data (i.e.: make the investment case for reporting to UIS) • Advocate for coordination across ministries / levels Share models from other countries for doing this, advocate for more transparency, etc. • Ensure that the country's demand for data and the indicators being produced is reflected in what the UIS produces.
Certain international data not valuable to government	• Resources exist but government may not benefit, e.g.: high income countries not reporting on 4.c because of disagreements over definitions of trained and qualified teachers. Indicators may not reflect the pressing issues for the country or not relevant to the country's education system.	• Global coordination, involve countries better in indicator design and prioritization.
Lack of expertise / knowledge	• Resource is possible, government would report and report following definitions, but they lack the expertise and training to report.	• UIS is doing a lot on this already but could focus on priority indicators and try to get countries to use existing resources for reporting more efficiently.

Source: UNESCO Institute for Statistics (UIS)

3.5 UIS strategic framework for cooperation with member states

A well-structured education data system is essential for ensuring reliable, timely, and harmonized data collection across countries. The UIS Data Streams of Work offer a structured and transformative approach to improving education data ecosystems, reporting mechanisms, policy engagement, and financial monitoring. By harmonizing methodologies, leveraging digital innovations, and building national capacity, this strategy strengthens national data ecosystems, enhances global reporting, empowers decision-makers, and ensures financial transparency. The accompanying presentation and diagram visually illustrate the data ecosystem, reporting flow, and strategic engagement required for sustainable education data transformation.

The UIS work with member states aims to engage with national data ecosystems, understanding existing processes, institutions, and also the work of other partner and stakeholders bridging collaboration based on existing capacities and ensuring interventions are relevant, sustainable, and owned by member states.

- **Strengthening national data ecosystems and harmonization** focuses on improving data reliability and comparability by integrating Education Management Information Systems (EMIS), Household Surveys (HHS), and Learning Assessments (LAs) into a unified framework. This includes developing national data catalogues to enhance integration, leveraging UIS Dynamic Templates to standardize indicator reporting, and applying the LASER Maturity Model to strengthen statistical capacity. A cohesive and harmonized national education data ecosystem ensures better data reliability, usability, and cross-country comparability.

- **Standardizing and enhancing data reporting** ensures consistency in education statistics, allowing for better monitoring of national, regional, and global education progress. Aligning national indicators with internationally agreed methodologies, strengthening learning assessments through AMPL and microdata processing, and expanding the use of National SDG4 Scorecards and Country Profiles create a structured and harmonized data reporting system. This improves data quality and strengthens country-level monitoring, ensuring informed decision-making based on comparable and high-quality data.

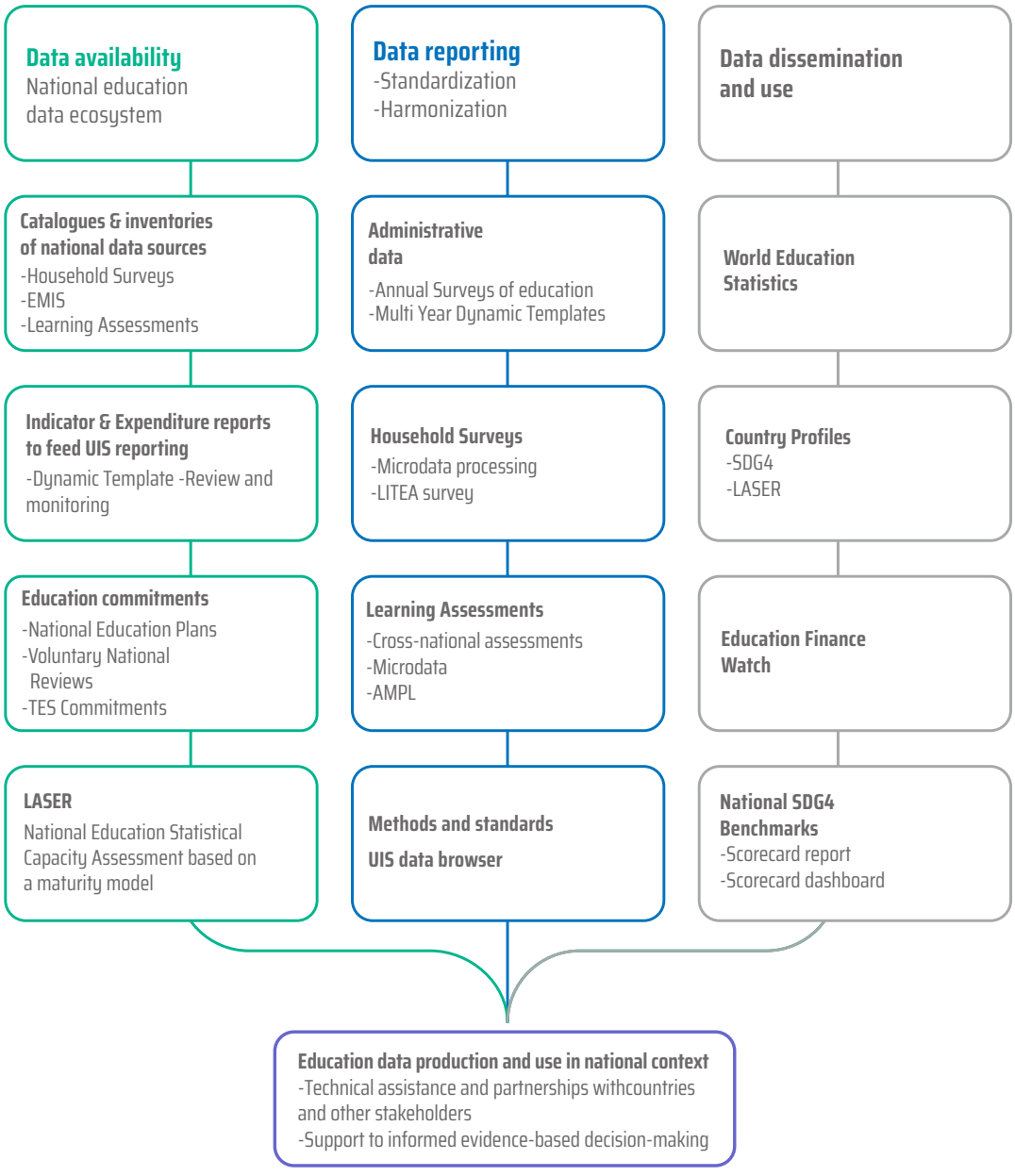
- **Enhancing data use and policy impact through the UIS toolkit** ensures that education data is accessible, actionable, and relevant for policymakers and stakeholders. The UIS Data Browser provides real-time, centralized access to education statistics, making data more accessible for researchers, donors, and government officials. The UIS Web Academy builds capacity by strengthening data literacy and equipping policymakers with analytical skills for evidence-based decision-making. Expanding country profiles and scorecards further enhances SDG4 monitoring, integrating education data into national planning and policy frameworks.

- **Strengthening Education Finance Watch and financial data utilization** focuses on ensuring transparent and efficient education resource allocation. Expanding Education Finance Watch (EFW) supports tracking of domestic and international education financing trends, improving alignment with UIS financial reporting standards. Strengthening the link between education financing and learning outcomes enables better-informed resource allocation, while data-driven financial planning enhances budget efficiency. By integrating financial data with education performance

metrics, governments can improve accountability, transparency, and investment efficiency, ensuring that education resources are effectively managed.

The Regional Data Initiative (RDI) and tools like the UIS Data Browser and Education Finance Watch (EFW) ensure interventions build on existing systems, fostering sustainable, country-owned solutions. **Figure 3.2** on UIS streams of work visualizes this approach.

Figure 3.2.
UIS cooperation with member states – Streams of work



Source: UNESCO Institute for Statistics (UIS)

UIS data dissemination

UIS data can be accessed through the following methods:

- The UIS DATA Browser brings together all UIS dissemination data on education science and culture, acting as a one-stop-shop resource for policymakers, researchers, and developers interested in examining internationally comparable data.

- The Data API facilitates programmatic access to the data within our Data Browser. It allows users to efficiently retrieve data at regular intervals to inform custom analysis, data visualizations and applications.

- Bulk data download service (BDDS) enables access to all UIS databases in comma-separated values (CSV) format. The BDDS files include both SDG 4 data and Other Policy Relevant Indicators data.

The SDG 4 Scorecard Dashboard displays country progress against SDG 4 Benchmark Indicators.

4. LASER unlocks the potential of education data

4.1 Introduction to LASER

The **LASER** tool, developed by the UNESCO Institute for Statistics (UIS), aims to empower countries to evaluate and strengthen their national education data ecosystems. Designed to assess the collection and use of diverse data sources, LASER supports informed policy making and effective governance of education systems. LASER helps countries identify available resources, highlight gaps, and leverage data to produce internationally comparable education indicators, ultimately enhancing capacity to produce education data.

LASER is not intended to replace any of the available sources or other national indicators reports publications of any country. On the contrary, it complements existing information and sheds light data gaps and underlying drivers by leveraging the multiple data sources available, with the goal of meeting both country-specific goals and SDG4. LASER also provides the opportunity to gain a comprehensive understanding of the situation of the education ecosystems capacity of each country to produce data against their regional and income group peers. This, in turn, serves as an incentive for countries to aim to improve their statistical capabilities as data producers in collaboration with other partner institutions.

Prior to devising effective education data strategies, countries must first understand what data and resources already exist, what is lacking, and where improvements are needed. LASER facilitates this by pinpointing obstacles and challenges in data production, reporting and utilization. It evaluates not only the coverage of key education themes but also the timeliness, completeness, quality, and accuracy of data. This aims to provide the necessary guidance to direct efforts and plan future data generation and delivery in accordance with the demands of the international community.

In essence, **LASER** enables countries to:

- Identify what data is required to produce indicators by examining the formula of each indicator
- Assess data quality
- Evaluate data disaggregation levels to address inequality
- Develop comprehensive strategies to bridge gaps and fortify education data ecosystems

The LASER acrostic reflects the following five core dimensions of an education data ecosystem:

- Learning assessment system: Aligned with international standards.
- Administrative data: Regularly collected, covering major education issues and dimensions of inequality.
- Survey population system: Routinely gathers education indicators and dimensions of inequality.
- Expenditure data: Consistently reported for all sources of private and public expenditure.
- Review and Monitor Progress: Ensures accountability through the publication of indicators reports, the elaboration of national plans and the monitoring of progress through benchmarks.

A **LASER** score, derived from each of these five components, reflects a country's overall statistical capacity. Each component's score stems from its sub-components, offering a granular view of the strengths and weaknesses of the national education data ecosystem. Before explaining each of the five LASER components in more detail, it is important to explore how LASER assesses data ecosystems.

4.2 Unpacking LASER: a three-step process

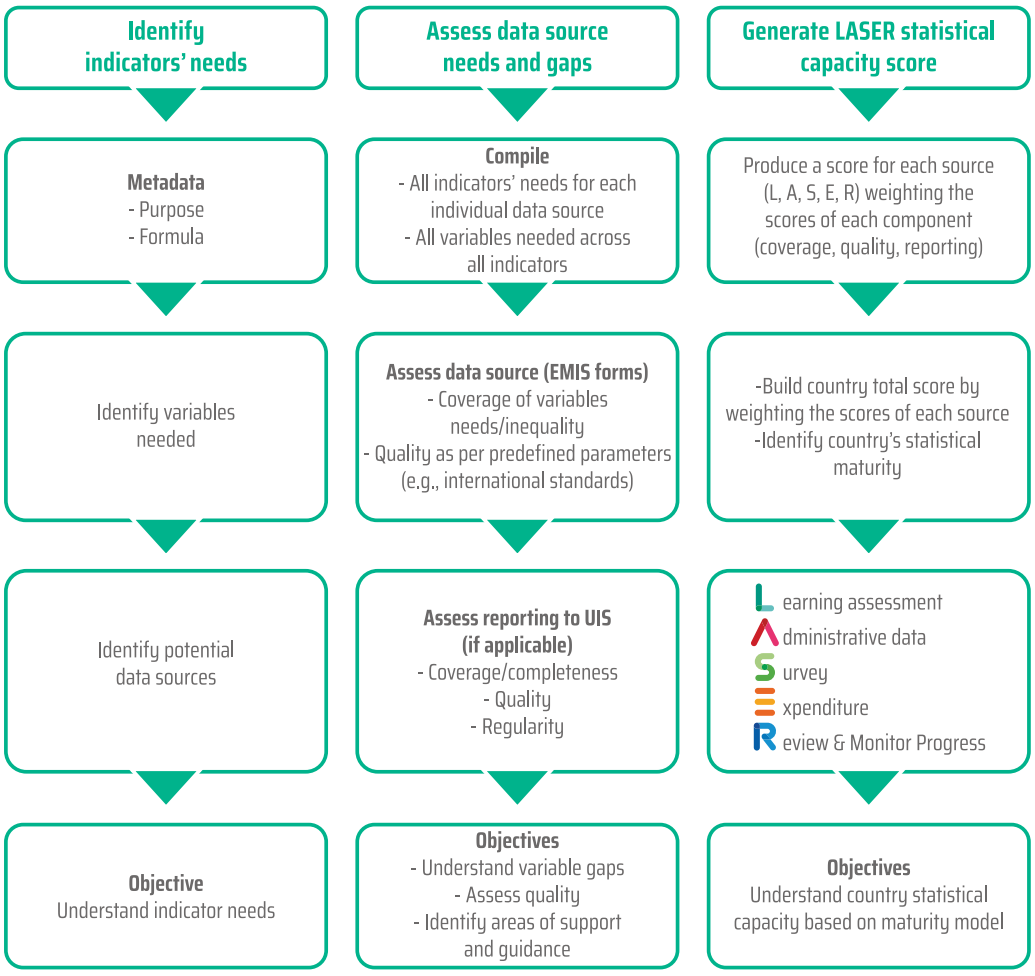
LASER examines both data availability and quality, addressing key questions such as: is the data needed to calculate education indicators collected by the country? If yes, is it reported? If not, what is impeding countries from reporting? Is there an issue with the quality of the data?

Data availability: Refers to that data is collected by the system, accessible, retrievable, regardless of its quality.

Data quality: Data must satisfy indicator concepts, definitions, and methodologies, and comply with standards including frequency disaggregation by age, sex, location, income, ethnicity, migratory status and disability status – core to SDG's "no one left behind" principle. Data gaps are of particular concern to the quality of SDG 4 indicators.

Figure 4.1 illustrates the process of producing the SDG 4 indicators, from unpacking the indicators to understand the variables needed for their production, to the analysis of the reporting capacity of data sources, ultimately culminating in understanding a country's statistical capacity to produce education indicators through the LASER Statistical Capacity Score.

Figure 4.1.
LASER and process of SDG4 indicator production



Source: UNESCO Institute for Statistics (UIS)

Step 1: Identifying indicator needs

To understand the required data, the first step is to unpack the indicator and check its purpose, metadata, and formula, as specified in the first column of **Figure 4.1.** This will help to pinpoint required variables for its calculation. Next, for each of these variables, we need to identify all the potential data sources and see if the country collects these variables in the first place, for instance, through national school census questionnaires. The LASER Country Profile (CP) provides a detailed mapping of variables needed to produce every indicator, and their data sources.

Consider **SDG indicator 4.2.2**, which measures the **"Participation rate in organized learning (one year before the official primary entry age), by sex."** According to its **metadata**, this indicator can be produced using either **administrative data** or **household survey data**, as both sources generally collect relevant information.

To calculate this indicator, three key variables are required:

- **National education system structure** – defines the official **primary entry age**, which determines the relevant **age group** for the indicator's numerator.
- **Population by age** – required to compute participation rates.
- **Enrolment by age** – necessary to determine the number of children in organized learning

Additionally, since the indicator must be **disaggregated by sex**, all data must be collected **separately for males and females.** This process must be **repeated for each SDG 4 indicator** to consolidate total data needs across different sources. **Table A.3 in the annex** provides a comprehensive breakdown of the possible **SDG 4 indicators** that can be estimated using different data source

Step 2: Assessing data source reporting capacity

Once all variables required for each indicator are mapped, the next step is to **assess whether these variables are collected** in the relevant data sources **(Column 2 in Figure 4.1)**; in other words, this means assessing the reporting capacity of the data source.

For example, if **24 indicators** can potentially be estimated using **administrative data**, the mapped list of variables must be examined to **identify any gaps** in data collection of this data source.

This step allows to:

- Identify gaps in data collection within each source.
- Assess basic quality levels of the collected data.
- Determine areas for improvement in data reporting and coverage.

These three dimensions are consolidated into a single score per data source – or LASER component (e.g., administrative data, surveys, or expenditure data).

Step 3: Generating LASER statistical capacity score

The same scoring process is applied to each data source, i.e. LASER component, and once combined, these scores produce a unique LASER Statistical Capacity Score that reflects the overall strength of a country's education data system.

The LASER Statistical Capacity Score serves multiple key functions:

- Engaging policymakers by spotlighting the health of education data ecosystems.
- Simplifying interpretation across multiple components.
- Providing a starting point for policymakers to identify weaknesses and set priorities for improvement.

Improving a country's aggregate score becomes an intuitive objective for policymakers. By understanding how the score is calculated, they gain insights into the most critical aspects of their education data ecosystem, helping them prioritize improvements effectively. Thus, the aggregate score is not only a communication tool but also a guide for targeted enhancements.

4.3 Weighting Methodology

To provide a comprehensive assessment of a country's education data ecosystem and its ability to meet reporting needs, LASER generates an aggregate score by synthesizing the scores of individual components based on assigned weights. In its initial version, these weights follow UIS criteria. Given the critical role that weighting plays in the final scoring, it requires careful discussion and consensus, which UIS will undertake as a next step. While alternative weighting approaches are considered to emphasize their significance, further deliberation is necessary to refine the methodology.

To ensure a balanced assessment, LASER comprises five components, each assigned a specific weight:

- Learning Assessments – 0.25
- Administrative Data – 0.25
- Survey Population System – 0.25
- Expenditure Data – 0.10
- Review and Monitoring – 0.15

The total LASER score is calculated as the weighted average of these components.

Deriving Component Scores

Each component consists of sub-components with their respective weights. For example, the Administrative Data component includes:

- Availability of ISCED Mapping – 0.20
- Response to UIS Education Survey – 0.50
- Coverage of Indicators in EMIS Forms – 0.30

The component score is a weighted average of the sub-component scores, each multiplied by its respective weight.

A detailed breakdown of these weights can be found in the annex.
By understanding how the score is calculated, countries can focus on **progressive improvements**, ensuring a sustainable and strategic approach to strengthening their education data systems.

4.4 LASER Maturity Model: A path to progress

The LASER maturity model offers a **simplified progression framework** that helps countries **assess, prioritize, and enhance** their education data ecosystems over time. It is structured as a series of levels, reflecting incremental improvements toward full compliance with the aspects assessed in the **Education Statistical Capacity** scoring.

The key principle of this model is **continuous improvement** rather than simply achieving the highest maturity level. Countries face **resource constraints**, and therefore, their goal should not be merely to "tick the box" for compliance, but rather to **strategically prioritize** efforts that yield the greatest impact on education data quality and policy alignment.

Maturity Levels and Policy Recommendations

The LASER maturity model consists of five progressive levels, each describing the degree of advancement in a country's education data ecosystem. **Table 4.1** below presents the characteristics of each of the maturity levels and the related recommendations:

Table 4.1.
Education statistical capacity maturity levels

Maturity Level	Characteristics	Recommendations
Nascent	• Poor coordination between data-producing institutions. • Limited or fragmented data collection. • Minimal compliance with international education data standards.	• Build basic enabling environment for data collection processes. • Align data collection with SDG4 indicators. • Develop initial capacity-building initiatives for data reporting.
Limited	• Data quality checks and validation processes are in development. • Low or no coverage of key education issues (e.g., bullying, home language). • Partial alignment with international reporting standards.	• Improve alignment with international standards. • Increase the frequency of data collection. • Implement some basic governance mechanism for data.
Moderate	• Partial coverage of key indicators (e.g., school connectivity, teacher training). • Basic governance for data is put into place to check. • Standardized data collection processes exist but may have gaps.	• Strengthen institutional coordination efforts. • Improve timeliness and completeness of education data reporting. • Expand coverage of key education issues.
Well-developed	• Education data ecosystem is well-structured and systematic. • High compliance with international reporting standards. • Use of data analytics to inform policy decisions.	• Ensure regular updates and maintenance of data. • Promote transparency and public access to education statistics. • Implement mechanisms for continuous data system improvements.
Sustainable	• Fully integrated, automated, and sustainable education data ecosystem. • Data is consistently used for policy formulation and decision-making. • High level of international collaboration and best-practice adoption.	• Strengthen long-term sustainability of data systems. • Leverage artificial intelligence and big data for deeper insights. • Regularly update methodologies to align with evolving global standards.

Source: UNESCO Institute for Statistics (UIS)

How the Maturity Model Supports LASER's Aggregate Score

Each country's position within the maturity model can be determined based on their **LASER component and sub-component scores.** This structured approach allows policymakers to:

- **Benchmark progress** across different aspects of the education data ecosystem.
- **Identify priority areas** that require targeted interventions.
- **Develop a strategic roadmap** for strengthening data governance and capacity.

By following this model, countries can **incrementally build** a robust education data ecosystem that not only meets reporting requirements but also enhances policy effectiveness and decision-making.

5. Learning assessments component

Large-scale assessments are designed to describe the achievement of students in a curriculum area in an aggregated form to provide an estimate of the achievement level in the education system as a whole at a particular age or grade level. Learning assessments measure students' knowledge and skills in specific subject areas, such as reading and mathematics, at a particular age or grade, such as end primary or end of lower secondary. Learning assessments include national school-based assessments designed to measure specific learning outcomes at a particular age or grade that are relevant for national policymakers, and cross-national assessments or CNAs (international or regional) that are based on a common, agreed-upon framework and follow similar procedures to yield comparable data on learning outcomes[3].

For national learning assessments, the Ministry of Education or a related government agency is responsible for conducting in most countries: they design, implement, and oversee them. As for regional and international assessments, the responsible entity varies. The two main organizations implementing global assessments are the International Association for the Evaluation of Educational Achievement (IEA), which organizes studies like TIMSS, the Progress in International Reading Literacy Study (PIRLS) and International Civic and Citizenship Education Study (ICCS); and the Organisation for Economic Co-operation and Development (OECD), which conducts studies like PISA and the Programme for the International Assessment of Adult Competencies (PIAAC). There are, however, other organizations conducting or supporting regional assessments, such as UNESCO's Regional Comparative and Explanatory Study (ERCE) in Latin America, the Southeast Asian Ministers of Education Organization and UNICEF's Southeast Asia Primary Learning Metrics (SEA-PLM) in South-East Asia, the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) in southern and eastern Africa, the Pacific Islands Literacy and Numeracy Assessment (PILNA) by the Educational Quality and Assessment Programme of the Pacific Community, and the Programme d'Analyse des Systèmes Éducatifs de la CONFEMEN (PASEC) in Francophone countries in West Africa.

While the primary objective of CNAs is to estimate measures of learning outcomes for a country, they also collect a rich set of background information about teachers, students and schools through a student assessment module, and questionnaires for students, teachers, and school directors (**Table 11**). CNAs collect data on contextual factors that influence student performance, such as students' socioeconomic background, gender, ethnicity, parental education levels, school infrastructure and resources, teacher's professional development, students experiencing bullying and their attitudes towards school and learning: such background information can provide insights into how student achievement relates to factors such as family socio-economic status, levels of teacher training, teachers' attitudes toward curriculum areas, teacher knowledge, and availability of teaching and learning materials. The CNA questionnaires determine whether an SDG indicator can be estimated, for which subpopulations it can be estimated, and how the equity dimension can be informed. **Table 5.1** presents a list of SDG 4 indicators that can be estimated using learning assessments.

In all large-scale assessments, the population to be assessed should be determined by the aims of the assessment and the corresponding information needs that will allow countries to measure and monitor learning. It is not necessary to obtain data for each student in the population: inferences of interest can be obtained from a suitably designed high-quality sample of students. This sample-based approach has many advantages including the substantial reduction of costs in test and questionnaire administration; greater accuracy due to the increased possibility to monitor the quality of implementation; and less time for processing, analyzing and reporting the data. Nevertheless, considerable attention is required in designing and selecting the samples.

3 This first version of LASER includes detailed analysis only for cross-national assessments.

Using data from CNAs offers many other advantages as compared to administrative data collected through EMIS: CNAs are generally nationally representative and include private schools - often excluded from EMIS; they contain rich data about students' background characteristics which permits disaggregation of indicators and provides information not collected in EMIS such as students' exposure to bullying, students' languages spoken at home, teachers' professional development, and schools' characteristics. However, CNAs have limitations including the fact that they are sample based and subject to sampling error; they are typically implemented for one or two grades (or an age group) rather than all students; and the questionnaire may result in an indicator that does not exactly correspond to the definition used in the SDG.

Learning assessments offer valuable insights into the quality and equity of education. Assessments that include contextual questionnaires for students, parents, and teachers enable in-depth analysis of equity in learning outcomes, offer valuable insights into the factors influencing academic performance and contribute to SDG4 monitoring.

Table 5.1.
SDG 4 indicators that can be calculated using learning assessments

Status	Indicator
Global	4.1.1 Proportion of children and young people (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex
Thematic	4.1.6 Administration of a nationally representative learning assessment (a) in Grade 2 or 3; (b) at the end of primary education; and (c) at the end of lower secondary education
Thematic	4.4.2 Percentage of youth/adults who have achieved at least a minimum level of proficiency in digital literacy skills
Thematic	4.5.2 Percentage of students in a) early grades, b) at the end of primary, and c) at the end of lower secondary education who have their first or home language as language of instruction
Global	4.6.1 Proportion of population in a given age group achieving at least a fixed level of proficiency in functional (a) literacy and (b) numeracy skills, by sex
Thematic	4.7.4 Percentage of students in lower secondary showing adequate understanding of issues relating to global citizenship and sustainability
Thematic	4.7.5 Percentage of students in lower secondary showing proficiency in knowledge of environmental science and geoscience

Source: UNESCO Institute for Statistics

Note: The following indicators are calculated using different sources, including learning assessments: 4.1.0 - 4.a.1 - 4.a.2 - 4.c.7.

5.1 Challenges and potential solutions

Reporting on learning outcomes faces a number of challenges including comparability of grades and education levels; comparability of assessment results across space and time; timeliness, accuracy, credibility and policy impact of the statistics; procedural alignment to ensure data integrity and robustness of results; financial costs of assessments; low coverage of cross-national assessments in low- and lower-middle-income countries and especially for measuring learning outcomes in early grades; and alignment and procedural quality of national assessments.

To address some of these challenges, efforts focused on the definition of a Minimum Proficiency Level (MPL) which is the benchmark of basic knowledge in a domain (e.g. mathematics, reading) at a given age/grade measured through learning assessments; the development of the Global Proficiency Framework (GPF) which is a useful global reference that defines a common reference for proficiency levels for reading and mathematics that learners are expected to demonstrate at the end of each grade level, from grades 1 to 9; the development of linking strategies to make different assessments comparable, such as the Rosetta Stone project, policy linking methodology and Assessments for Minimum Proficiency Levels (AMPLs).

5.2 Learning assessments subcomponents

Four dimensions are taken into account in this first version for a total score component (L) of 25% of total LASER score as summarized in **table 5.2** below.

- Regularity of administration
- Coverage of major education issues (SDG 4 Indicators)
- Coverage of major dimensions of inequality
- Alignment with Internationally Accepted Standards

Table 5.2.
Learning assessments: component and sub-components weights

	Key component	Sub- components
Learning assessments	0.25	
Regularity of administration		0.20
Coverage of major education issues (SDG 4 Indicators)		0.30
Coverage of major dimensions of inequality		0.20
Alignment with Internationally Accepted Standards		0.30
Total		**1.00**

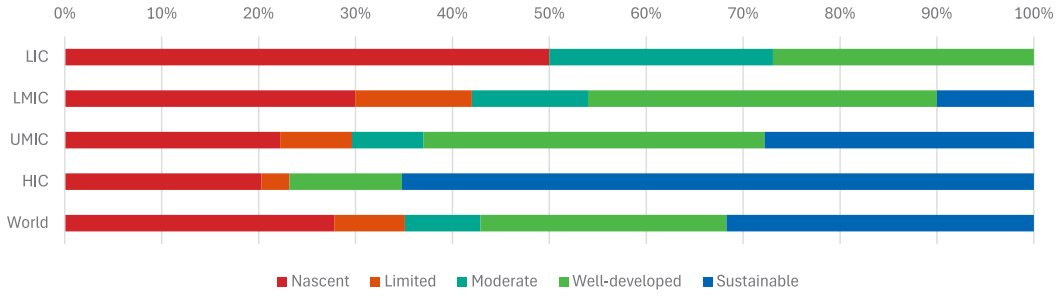
Source: UNESCO Institute for Statistics (UIS)

An analysis of learning assessment statistical capacity maturity across different countries is presented in **figures 5.1. and 5.2** by income level and SDG region.

Analysis of statistical capacity by income shows that Low Income Countries (LIC) have a high percentage of countries with “Nascent” statistical capacity (the lowest maturity level); as income levels increase, the proportion of countries with more advanced statistical capacity (specifically “Well-developed” and “Sustainable”) also increases. On the other hand, High Income (HIC) level countries have the highest proportion of countries with “Sustainable” statistical capacity. Middle Income Countries both (Lower and Upper) show a mix of “Moderate” and “Well-developed” statistical capacity, indicating progress but also disparities showing learning assessments are not yet steady.

Figure 5.1.

Distribution of statistical capacity by 'Learning assessments' component and country income group
Percentage of countries by statistical capacity

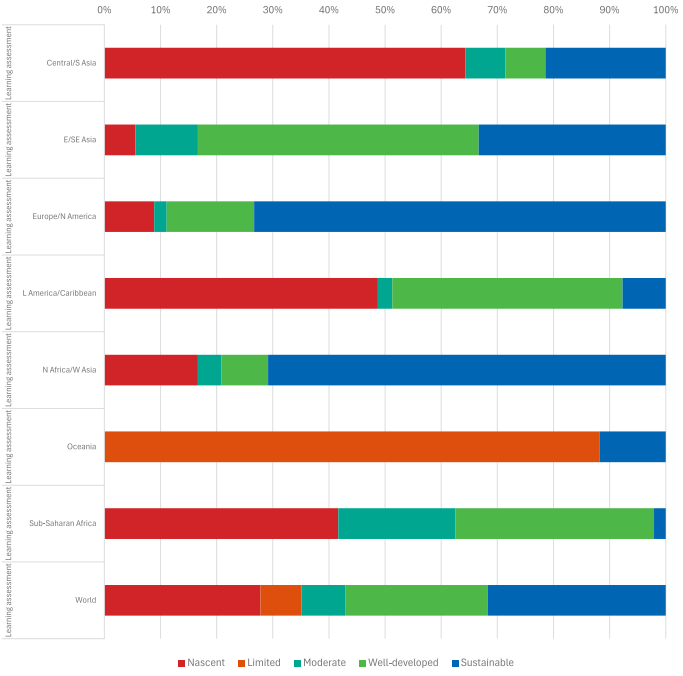


Source: UNESCO Institute for Statistics (UIS)

Analysis of statistical capacity by SDG region shows that the region Europe/North America has the highest proportion of countries with "Sustainable" statistical capacity that is consistent with the share by level of income as most of the countries belong to this group. Latin America/Caribbean and North Africa/West Asia regions show "Moderate" to "Well-developed" statistical capacity but still have some countries in weaker categories. Central/South Asia and Sub-Saharan Africa have a high percentage of countries with "Nascent" statistical capacity while Oceania has a significant percentage of countries with "Limited" statistical capacity.

Figure 5.2.

Distribution of statistical capacity by 'Learning assessments' component and SDG region
Percentage of countries by statistical capacity



Source: UNESCO Institute for Statistics (UIS)

5.3 Country's self-evaluation checklist

The Learning Assessment self-assessment checklist focuses on evaluating key dimensions of a country's assessment systems, including the regularity of administration, coverage of major education issues and inequality dimensions, and alignment with internationally accepted standards. These aspects enable policymakers to address critical questions, such as the importance of investing in learning assessments, the types of approaches to adopt, and the steps to build a mature and effective system.

Learning assessments are not just tools for measuring outcomes; they provide valuable insights into how and what students are learning, driving evidence-based decisions. Without alignment to international standards, however, such data cannot support meaningful cross-country comparisons. This checklist offers a structured framework to identify gaps and strengths in national learning assessment systems, ensuring their alignment with global best practices.

To assist countries in evaluating their learning assessment data, the following self-assessment checklist is structured around key subcomponents:

1. **Regularity of administration**
   - Does the country participate in any regional or international learning assessment?
   - If yes, what is the reporting status? If not, does the country have at least a national learning assessment? What is country's benefit in participating in regional or international assessment?
   - Are learning assessments conducted at consistent intervals?
   - Is there a predefined schedule outlining the frequency of these assessments?
   - Have there been instances of missed or delayed assessments in recent cycles?

2. **Coverage of major education Issues (SDG 4 Indicators)**
   - Do the assessments address the core areas outlined in Sustainable Development Goal 4?
   - If not, what is missing and what is its relevance to national priorities and policies?
   - Are indicators such as literacy, numeracy, and equitable quality education adequately covered?
   - Is there a mechanism to update assessment content in line with evolving national and global educational priorities?

3. **Coverage of major dimensions of inequality**
   - Do the assessments capture data across diverse student demographics, including gender, socioeconomic status, and geographic location?
   - Is there an analysis of performance disparities among different student groups?
   - Are the findings used to inform policies aimed at reducing educational inequalities?

4. **Alignment with internationally accepted standards and data quality**
   - Are the assessment frameworks and methodologies aligned with international benchmarks?
   - Is the assessment designed to collect comprehensive and representative data which reflect country's actual learning outcomes?
   - Has the assessment process undergone external validation or benchmarking against global standards?
   - Is there a plan to participate in international large-scale assesments to facilitate cross-country comparisons?

5.4 Practical examples

Lack of timely data to monitor trends

A new administration committed to enhancing education quality reviewed the LASER scores and found that while key educational areas scored above 80%, the regularity of learning assessments was below 50%. Assessments were conducted sporadically, lacking a systematic framework. With LASER's guidance, the Ministry of Education recognized the need to improve assessment frequency. Consequently, the country allocated resources to ensure systematic learning assessments, aiming for a triennial schedule. Regular assessments are crucial for monitoring student progress and informing instructional strategies.

Aligning National Assessments with International Standards: A Minister's Initiative for Global Educational Comparability

National Learning Assessments and International Accepted Standards A Minister preparing for an international education summit intends to highlight the comparative quality of the country's education system. However, upon consulting the LASER, the country discovers that, despite the high frequency of national learning assessments, they lack alignment with internationally accepted standards. This misalignment hinders meaningful cross-country comparisons. Recognizing the importance of such alignment for accurate benchmarking, the Minister advocates for the integration of international standards into the national assessment framework through statistical linking process. This initiative aims to enhance the comparability of student performance data globally, thereby informing and improving educational strategies.

Learning assessments: policy questions

1. **Are children learning?**
   By monitoring and understanding learning outcomes, policymakers can identify areas of improvement, allocate resources more efficiently, and tailor interventions to meet students' needs.

2. **How well are students learning in the education system?**
   (with reference to general expectations, aims of the curriculum, preparation for further learning or preparation for life)

3. Does evidence indicate **particular strengths and weaknesses** in students' knowledge and skills?

4. **Is there any difference in academic performance between boys and girls?**
   This data can potentially address gender-based disparities in education and implement targeted interventions to ensure gender equity in learning outcomes.

5. **Is there any difference in academic performance across socioeconomic groups?**
   (urban vs. rural locations, students from different languages or ethnic groups, students in different regions of the country). With this information, policymakers could identify disparities in access to quality education and design targeted interventions to bridge the achievement gap and provide opportunities for disadvantaged students.

6. **What factors are associated with student achievement?**
   To what extent does achievement vary with characteristics of the learning environment (school resources, teacher preparation and competence and type of school) or with students' home and community circumstances?

7. **Are government standards being met in the provision of resources?**
   (for example, textbooks, teacher qualifications and other quality inputs)

8. **Do the achievements of students change over time?**

9. **Are teachers qualified? Does teacher training affect learning outcomes?**
   Policymakers can use this information to establish and enforce teacher certification standards, provide professional development opportunities, and allocate resources to ensure a well-qualified teaching workforce.

6. Administrative data

Administrative data provides the bulk of internationally comparable education statistics, which are used to fulfil countries' international reporting responsibilities related to global or regional education agendas and to inform the international community on other policy-relevant issues. More than 50% of the SDG 4 indicators can be reported through administrative data sources which underscores the critical role that such data plays in advancing SDG 4. **Table 6.1** presents a list of SDG 4 indicators that can be estimated using administrative data.

Administrative data is derived from the information typically found in Educational Management Information Systems (EMIS) used by Ministries of Education (MOEs) for planning and management purposes. This data is updated on an annual basis and encompasses various educational paths and levels, including early childhood education (ECE), primary, secondary, and higher education, as well as technical and vocational education and training (TVET). Administrative data include data on schools, students and teachers such as enrollment, attendance, dropout and repetition rates, student and teacher demographics, teacher qualifications, school infrastructure and location. Some administrative data, such as school feeding programs and teachers' salaries, is also available in MOEs from sources other than EMIS and should ideally be linked to EMIS.

The data is collected by education institutions, school districts, and government agencies responsible for managing and overseeing the education system. The school survey questionnaire is the core component of most EMIS, serving as the foundation for administrative data collection. Most countries use the 'school-census approach' to collect information, where an annual census questionnaire is sent to schools to collect the education data the government needs to monitor the education system. EMIS is meant to facilitate the collection, processing, analysis, monitoring, and dissemination of administrative data. It could act as a valuable source of information to inform equity and complement other data sources, such as household surveys and learning assessments. EMIS can also integrate data sources, that do not only come from the education sector, into a unified information management system. For instance, if a common identifier exists, EMIS can connect with health information systems to analyze correlations between education and health variables.

Table 6.1.
SDG 4 indicators that can be calculated using administrative data

Status	Indicator
Thematic	4.1.3 Gross intake ratio to the last grade (primary education, lower secondary education)
Thematic	4.1.7 Number of years of (a) free and (b) compulsory primary and secondary education guaranteed in legal frameworks
Thematic	4.2.4 Net early childhood education enrolment rate in (a) pre-primary education and (b) early childhood educational development
Thematic	4.2.5 Number of years of (a) free and (b) compulsory pre-primary education guaranteed in legal frameworks
Thematic	4.5.3 Existence of funding mechanisms to reallocate education resources to disadvantaged populations
Global	4.7.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Thematic	4.7.2 Percentage of schools that provide life skills-based HIV and sexuality education

Thematic	4.a.3 Number of attacks on students, personnel and institutions
Global	4.c.1 Proportion of teachers with the minimum required qualifications, by education level.
Thematic	4.c.2 Pupil-trained teacher ratio by education level
Thematic	4.c.3 Percentage of teachers qualified according to national standards by education level and type of institution
Thematic	4.c.4 Pupil-qualified teacher ratio by education level
Thematic	4.c.6 Teacher attrition rate by education level

Source: UNESCO Institute for Statistics

Note: The following indicators are calculated using different sources, including administrative data: 4.1.4 - 4.1.5 - 4.2.2 - 4.3.2 - 4.3.3 - 4.a.1 - 4.c.5 - 4.c.7.

6.1 Challenges and potential solutions

Producing internationally comparable education statistics is intricately tied to the challenges that administrative data systems face and affect the quantity of data produced, its quality, the quality of analysis, and biases introduced using different data sources to calculate an indicator. Challenges include:

- Are the data available? Are they collected at the national level in the first place?
- Do data derived from administrative systems capture inequality dimensions?
- Are school response rates low?
- Do countries have tools sufficiently adapted to allow good quality reporting?
- Do countries have the required national expertise to produce data?
- Do the data meet standards, such as ISCED? Do they follow global indicator definitions and standard global frameworks?
- Is the national population used to calculate some indicators such as enrolment and out-of-school rates?

Many efforts were made to address issues arising from using administrative data to report on SDG 4:

- The UIS developed a dynamic template, an effective national education data compilation tool and a capacity-development tool. It facilitates real-time calculation of indicators, highlights gaps in administrative data, promotes transparency in indicator production, increases data coverage particularly in countries with fragmented administrative systems, and facilitates national policy and monitoring discussions.
- The UIS recently started the implementation of a hybrid population data policy, increasing national ownership of education statistics and their accuracy.
- The UIS focused on building capacity in EMIS, essential for producing timely and comprehensive administrative data. Strengthening administrative data systems is central to ensuring accurate, comparable, and policy-relevant indicators at national and global levels.

6.2 Administrative data subcomponents

Three dimensions are taken into account in this first version for a total score component (A) of 25% of total LASER score as summarized in **table 6.2**.

- ISCED 2011 mapping is available
- Response to UIS Education Survey in the period
- Coverage of indicators in EMIS forms

Table 6.2.
Administrative data: component and sub-components weights

Administrative data	0.25	
ISCED mapping 2011 is available		0.20
Response to UIS Education Survey in the period		0.50
Coverage of indicators in EMIS forms		0.30
Total		**1.00**

Source: UNESCO Institute for Statistics (UIS)

Through this component, the policymaker will be able to answer whether the country's EMIS is effectively designed to collect relevant variables that can be used to calculate indicators. It would also help to assess whether inequality issues can be addressed, as well as identifying whether the country has its ISCED mapping, which is the main standard for producing internationally comparable data.

Major dimensions of inequality, such as gender, socioeconomic status, disability, and geographic location, should ideally be captured in EMIS forms. There is also a need for a mechanism to ensure the accuracy and reliability of disaggregated data which could be utilized in policy formulation and resource allocation to address educational disparities.

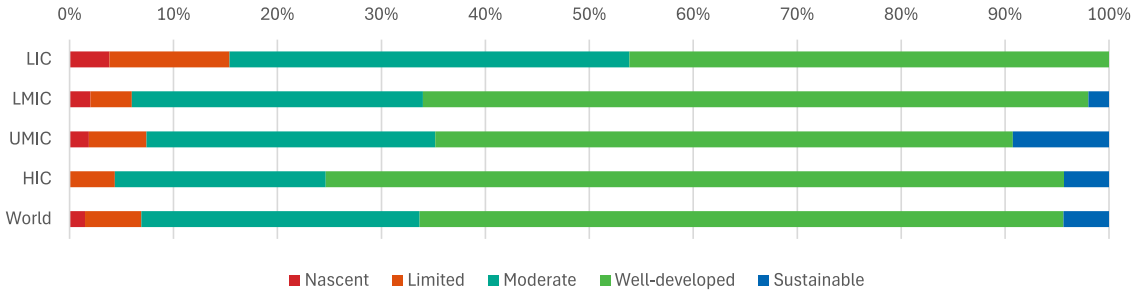
The analysis shows a very high % of countries (refer to **Figures 6.1 and 6.2**)

An analysis of administrative data statistical capacity maturity across different countries is presented in figures 6.1. and 6.2 by income level and SDG region.

An analysis of statistical capacity by income shows that low-income countries (LICs) tend to have weaker statistical systems, with most classified as having "Nascent" or "Limited" capacity, making data collection and analysis challenging. Lower-middle-income countries (LMICs) show progress, with more reaching "Moderate" and "Well-developed" levels. Upper-middle-income countries (UMICs) continue this trend, with fewer in the lower categories and more in "Well-developed" and "Sustainable." High-income countries (HICs) have the strongest statistical infrastructures, with most classified as "Well-developed" or "Sustainable" and few, if any, in the lower categories.

Figure 6.1.

Distribution of statistical capacity by 'Administrative data' component and country income group
Percentage of countries by statistical capacity

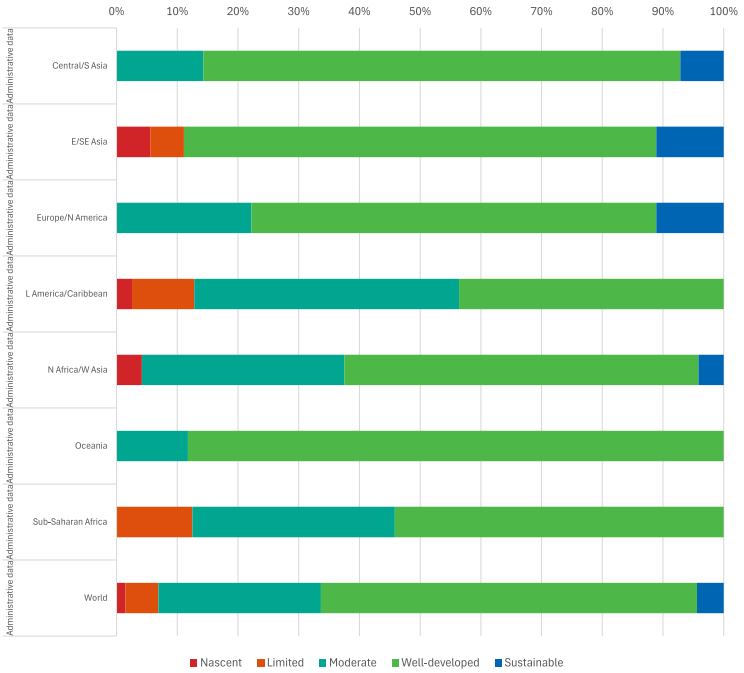


Source: UNESCO Institute for Statistics (UIS)

An analysis of statistical capacity by SDG region shows that Europe and North America lead with the highest concentration of "Well-developed" and "Sustainable" systems, while Sub-Saharan Africa struggles, with many countries in the "Nascent" and "Limited" categories. Other regions fall in between. East and Southeast Asia have a notable presence in "Limited" and "Moderate" categories, while Central Asia, Latin America and the Caribbean, Northern Africa and Western Asia, and Oceania show a more balanced distribution. Globally, many countries fall into "Limited" and "Moderate" categories, emphasizing the need for greater investment in statistical capacity.

Figure 6.2.

Distribution of statistical capacity by 'Administrative data' component and SDG region
Percentage of countries by statistical capacity



Source: UNESCO Institute for Statistics (UIS)

6.3 Self-Evaluation Checklist

The Administrative Data self-assessment checklist focuses on evaluating the core elements of a country's Education Management Information System (EMIS) to ensure its effectiveness and comprehensiveness. This includes assessing the availability and alignment of ISCED 2011 mapping for international data comparability, responsiveness to UIS education surveys, and the inclusion of key indicators and dimensions of inequality within EMIS forms. By analyzing the data and metadata collected through national school censuses, this checklist helps identify whether the system captures the variables necessary for calculating core indicators and addressing inequality issues. This comprehensive approach equips policymakers with reliable administrative data to support informed decision-making and evidence-based policy development, strengthening the foundation of national education systems.

1. **Availability of ISCED mapping 2011**
   - Has the country developed and published an ISCED 2011 mapping of its national education system?
   - Does the available ISCED mapping reflect the current country's situation?
   - Is the ISCED mapping regularly updated to reflect changes in the education system?
   - Is the ISCED mapping accessible to stakeholders and used in reporting education data and statistics for international comparability?

2. **Response to UIS Education Survey (questionnaire A and C) and dynamic templates**
   - Has the country consistently responded to the UIS Education Survey and dynamic templates?
   - If not, are the missing data available at national level to close the data gap?
   - What is the level of data completeness and quality? If lower what are possible action to improve it?
   - Is the trend for data completeness and quality improving over the years? If not, what is the reason of a decline and what is the best approach to address it?
   - Is there a designated team or individual responsible for coordinating responses to the UIS Education Survey?

3. **Coverage of indicators in EMIS Forms**
   - Is the EMIS forms or annual school census forms available and can be shared or accessible to external users?
   - Does the EMIS collect all necessary variables and data disaggregation to produce key education indicators?
   - Are the data collection instruments aligned with national and international reporting requirements?
   - Is there a process to review and update EMIS forms to capture emerging educational priorities?

6.4 Practical examples

Enhancing methodological consistency and quality

Even when a country achieves high scores in regularity and coverage, issues in the methodological definitions of indicators can hinder quality reporting. These challenges often stem from misaligned measurement standards, inadequate metadata, or outdated methodologies. LASER serves as a guide for conducting detailed assessments of data production systems, focusing on dimensions such as timeliness, quality, accuracy, and alignment with international standards.

Aligning Indicators with International Standards.
Example 1

A country produces an indicator in national reports, however, when reading LASER the indicators is categorized as unavailable, and the country understand that calculation differs from international standards, leading to discrepancies in reporting and comparability. Using LASER, the country reviews the required variables in EMIS form to produce that indicator, identifying inconsistencies with SDG4 global framework. The Ministry of Education revises its definitions and measurement methods to align with international standards, improving the accuracy and comparability of its data.

Methodological Consistency and Quality
Example 2: Harmonizing existing administrative system for reporting purposes

A country analyzing its LASER report notes high scores in the Administrative Data Dimension due to a comprehensive school census covering enrollment and infrastructure. However, gaps in teacher-related data, such as qualifications, newly recruited teachers and salaries, result in lower scores. The Ministry of Education identifies the need to integrate payroll and human resource systems with the broader data ecosystem. This integration would enable tracking teacher qualifications, salary trends, and recruitment, enhancing data utilization for national statistics. An action plan is launched to address these gaps and strengthen the education data ecosystem.

Frequency of administrative data collection
Example 3: Insufficient timing of key Indicators

A country produces key education indicators, such as those related to school infrastructure, but the data collection occurs infrequently (e.g., a census conducted every 10 years). As a result, policymakers lack timely data to monitor trends or respond to emerging challenges effectively. With LASER's guidance The Ministry of Education analyzes LASER scores and recognizes the need to improve the regularity of school infrastructure and learning assessments. The country allocates resources to conduct school infrastructure censuses every three years.

LASER's strategic multilateral role
Example 4

Potential to enhance administrative data at a regional/global level. International cooperation agencies, development banks and private stakeholders invest in policies aimed at enhancing data ecosystems across countries. Historically, there has been scarce cross-country comparable information to guide regional or international cooperation in strengthening data ecosystems agenda. As an attempt to quantify the status of data ecosystems through comparable aggregated score design, LASER tool can guide cooperation and investment from regional or global stakeholdersA regional organization is advancing an agenda to enhance education statistics and the capacities of Ministries of Education. They convene a meeting to assess challenges faced by countries, starting with an analysis of LASER's comparable capacity scores in the administrative data dimension and other key areas. Leveraging the LASER Mapping of variables aligned with SDG4 indicators, the organization reviews countries' EMIS forms to evaluate their status, comprehensiveness, and existing gaps. Based on this analysis, they collaboratively develop a country-specific plan to incorporate new dimensions and questions into the EMIS forms, ensuring alignment with SDG4 reporting requirements and the ability to monitor major educational trends.

Administrative data: policy questions

Administrative data plays a crucial role in addressing a wide range of policy questions and monitoring progress towards SDG4. These data sources offer a holistic view of the education system, allowing policymakers to identify trends, gaps, and areas for improvement in the education system. Moreover, making data accessible at all levels, such as to school administrators and teachers, through open data reporting can contribute to develop effective school-level – or even teacher and student-level –policies.

1. **What is the average student-teacher ratio by school level?**
   This ratio is crucial for optimizing education quality, resource allocation, and equity in the education system. A lower ratio reflects more individualized attention and better support for students, hence improved learning outcomes.

2. **How are schools distributed across the country?**
   Is there a shortage of schools for certain grade levels? This information can help identify geographical disparities in access to education and facilitate the allocation of resources and infrastructure development where they are most needed.

3. **Are children able to complete school?**
   At which age and levels do high proportions of over-age children exist? Is the education system able to retain students until the last grade of the education cycle? Are students transitioning from one level to another? Are there high repeaters in different grades? Through these questions, policymakers can discern at which age and levels a significant proportion of students lag behind, enabling the implementation of targeted support mechanisms to enhance retention and progression.

4. **What is the impact of migration on the education system?**
   How many migrant students are there in the system? If available, administrative data can provide insights into the number of migrant students in the education system and evaluate the challenges posed by their influx. This information is crucial for addressing migration-related challenges and ensuring access to quality education for all.

5. **How to improve disability policies and what type needs more attention?**
   What is the percentage of disabled and types of disability? By collecting data on the number of students with disabilities, categorized by the type of disability, administrative data can assist in improving disability policies. This allows policymakers to identify areas that require more attention and resources.

7. Surveys population component

Historically, education indicators have been produced by education institutions or ministries based on administrative data – or records – tailored to each country's needs. However, surveys have become increasingly more available in the past 30 years and have become a complementary source of data on education indicators. In a few situations such as using data to understand equity issues, they have become an exclusive source of data. A research and development agenda aimed at enhancing the use of surveys within educational information systems could contribute to a more holistic understanding of educational processes and outcomes, enabling better-informed policies and decisions in countries.

Multipurpose Household Surveys, Labor Force Surveys, and Population Censuses are significant sources of data on access, participation, completion, literacy, educational attainment, and population. They differ in terms of coverage, frequency, objectives, and questionnaire design. Unlike administrative data, they are collected less frequently and by different organizations and countries (typically, from non-EMIS entities outside of MOEs). They are mainly conducted by National Statistic Offices, with little coordination with other line Ministries. Some are implemented with the support of international organizations, such as the World Bank's Living Standards Measurement Study (LSMS) or UNICEF's Multiple Indicator Cluster Surveys (MICS).

Household surveys are the most important source of socioeconomic data as they collect nationally representative data on population and household demographics, such as age, gender, ethnicity, and household composition, along with socioeconomic indicators like income, consumption, labor market outcomes, housing conditions, health, and access to basic services from a representative sample of the population. They play a crucial role in assessing economic well-being, measuring poverty and inequality, and monitoring social welfare policies.

Labor Force Surveys are nationwide surveys of households conducted regularly to gather data on demographic and socio-economic characteristics of the population, including education, and are primarily geared towards the estimation of employment levels in a country.

Population censuses enumerate the entire population of a country and provide essential information on a population's spatial distribution, household demographics, living conditions, education, language skills, migration and labor market outcomes.

Surveys are the only source of data on individuals not participating in the formal education system, including out-of-school children, adults, ethnic minorities, children with disabilities, migrants, and other marginalized populations. They are also an important source of data on literacy rates, school dropouts, repetition, regional disparities, and labor market linkages. The latter can provide insights on the relationship between education and employment outcomes, identify skills gaps, and inform policies to align education and training with labor market demands. They provide context for education planning, highlighting the socioeconomic factors that may influence educational outcomes.

Surveys bring many advantages to education statistics, even though their primary aim is not education related:

- **Disaggregation:** Surveys collect information on individual and household characteristics impacting educational effectiveness, such as sex, ethnicity, disability, income or wealth, and family composition.
- **Consistency:** Indicators, such as the population of out-of-school children, have historically combined administrative enrolment counts (numerator) and population data (denominator). Household surveys provide both the numerator and denominator for calculating such indicators, using the same population framework for both components.
- **Representativeness:** Surveys with a nationally representative sample frame (and with geographic and socioeconomic strata) can collect information on selected indicators that is not included in administrative data, e.g. self-reported skills and non-formal training of youth and adults. The benefits of surveys become more evident when they are part of a regular programme, ensuring the continuous and comparable production of statistics over time.

Table 7.1.

SDG 4 indicators that can be calculated using household survey data

Status	Indicator
Global	4.1.2 Completion rate (primary education, lower secondary education, upper secondary education)
Global	4.2.1 Proportion of children aged 24-59 months who are developmentally on track in health, learning and psychosocial well-being, by sex.
Thematic	4.2.3 Percentage of children under 5 years experiencing positive and stimulating home learning environments
Global	4.3.1 Participation rate of youth and adults in formal and non-formal education and training in the previous 12 months, by sex
Global	4.4.1 Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill
Thematic	4.4.3 Youth/adult educational attainment rates by age group and level of education
Thematic	4.6.2 Youth/adult literacy rate

Source: UNESCO Institute for Statistics

Note: The following indicators are calculated using different sources, including surveys: 4.1.0 - 4.1.4 - 4.1.5 - 4.2.2 - 4.3.2 - 4.3.3 - 4.5.4 - 4.5.6 - 4.a.2 - 4.c.5.

Note: SDG Indicator 4.6.2 will become a global indicator in 2025.

7.1 Challenges and potential solutions

Addressing numerous challenges to household survey effective implementation and utilization is essential to ensure comparable, reliable and meaningful data for monitoring progress towards SDG 4. These are presented below along with some potential solutions.

1. **Non-harmonized survey instruments:** Questions are not consistent across surveys, do not follow similar formats limiting the disaggregation of education indicators by level, and do not necessarily capture some education programmes, such as pre-primary and technical education affecting the calculation of certain SDG indicators. This could be addressed by the introduction of a dialogue between the NSO, the MoE and any technical partner at the drafting stage of the survey questionnaire.

2. **Different reference periods:** Variations in reference periods for educational data collection can affect comparability between surveys. This could be addressed by aligning reference periods for data collection with SDG 4 indicators; and collaborating with ILO to align the reference period for SDG global indicator 4.3.1 across labour force surveys.

3. **Quality and comparability of background information:** Issues like age misreporting and differences in defining socioeconomic factors like household wealth, migration and disability can affect comparability across surveys. Potential solutions include gathering data on respondent's month of birth and interview date to calculate the age at the beginning of the school year; collecting contextual information using existing international guidelines; and working in close collaboration with the Inter-Secretariat Working Group on Household Surveys (ISWGHS).

4. **Literacy, knowledge and skills:** Survey-based measurements of literacy vary in terms of self-reported and direct measures, and the choice of questions and populations assessed can affect comparability. This could be addressed by providing guidance with examples of questions that could be used for comparability.

5. **Household education expenditure:** Collecting accurate expenditure data via surveys is challenging due to respondents' recall accuracy, their willingness to share financial information, and the types of expenses captured and their recall periods. This could be addressed by developing guidelines for a standard set of questions on education expenditure for household income and expenditure surveys.

6. **Availability and accessibility of survey data:** Access to survey and census data, including microdata and metadata, is vital for their effective use. Many countries do not make their data accessible, limiting cross-country analysis. International repositories like the International Household Survey Network (IHSN) provide a platform for data dissemination, but metadata often lack information needed to assess survey methodology and coverage. This could be addressed by granting the UIS, as the custodian agency, data files; publicly publishing complete metadata within international survey repositories; utilizing tools and standards to facilitate data cataloguing, repository establishment and metadata alignment; and establishing and developing a household survey data repository with the collaboration of Member States.

7.2 Survey population systems subcomponent

Three dimensions or sub-components are taken into account in this first version of LASER for a total score component (S) of 25% of total LASER score. They are summarized in **table 7.2**.

- Household surveys
- Labour Force Surveys (LFS)
- Population census

Table 7.2.
Survey population systems: component and sub-components weights

Survey population system	0.25	
Household surveys		0.50
Labour force surveys		0.25
Population census		0.25
Total		**1.00**

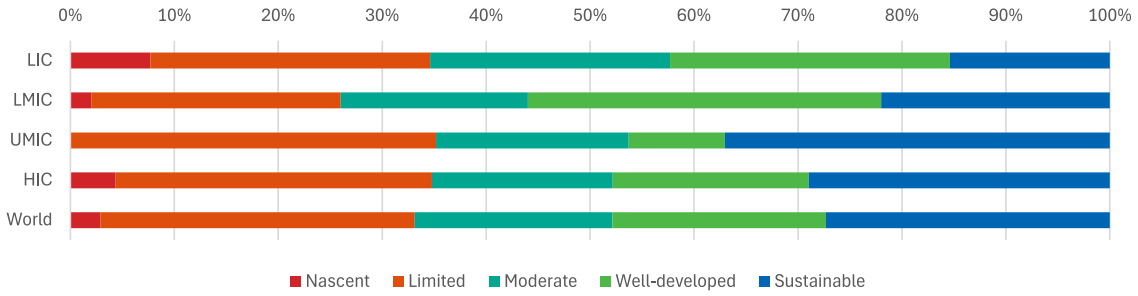
Source: UNESCO Institute for Statistics (UIS)

An analysis of survey population systems statistical capacity maturity across different countries is presented in Figures 7.1. and 7.2 by income level and SDG region.
Analysis of statistical capacity by income shows that low-income countries (LICs) have the highest proportion of "Nascent" and "Limited" statistical capacity, indicating weak data systems. As income levels increase, statistical capacity improves, with lower-middle-income countries (LMICs) showing more "Moderate" and "Well-developed" systems. Upper-middle-income countries (UMICs) continue this trend, with a greater presence in the "Well-developed" and "Sustainable" categories. High-income countries (HICs) have the strongest statistical systems, with the majority classified as "Well-developed" or "Sustainable."
Table 7.1 presents a list of SDG 4 indicators that can be estimated using survey data.

Figure 7.1.

Distribution of statistical capacity by 'Survey population systems' component and country income group

Percentage of countries by statistical capacity



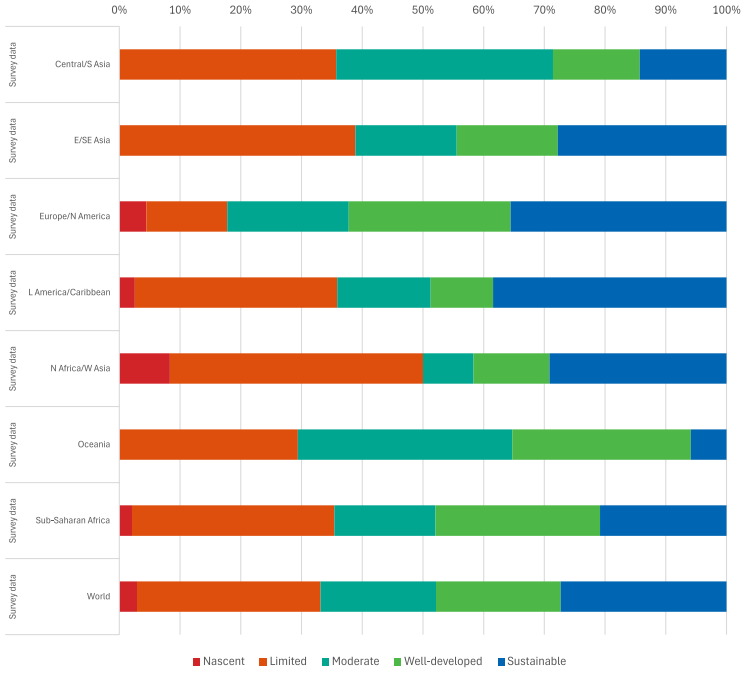
Source: UNESCO Institute for Statistics (UIS)

Analysis of statistical capacity by SDG region shows that Europe and North America have the highest concentration of "Well-developed" and "Sustainable" statistical systems, reflecting strong data infrastructures. In contrast, Sub-Saharan Africa has a large share of countries with "Nascent" and "Limited" capacity, indicating significant challenges in building reliable statistical systems. Other regions, such as Latin America and the Caribbean, Northern Africa and Western Asia, and Oceania, show a more balanced distribution, with countries spread across "Limited," "Moderate," and "Well-developed" categories. East and Southeast Asia and Central and Southern Asia have a notable presence in the "Limited" and "Moderate" categories but also show some progress toward "Well-developed" and "Sustainable" levels.

Figure 7.2.

Distribution of statistical capacity by 'Survey population systems' component and SDG region

Percentage of countries by statistical capacity



Source: UNESCO Institute for Statistics (UIS)

7.3 Self-assessment checklist

The Survey Population system checklist assesses the availability, regularity, and coverage of key tools like household surveys, labor force surveys, and censuses. While collected in most countries by the National Bureau of Statistics, it plays a key role in advancing the education agenda and producing education indicators. For instance, the population by age remains a key variable for calculating a considerable number of education indicators. By ensuring these tools capture education issues, inequalities, and socioeconomic factors while aligning with international standards, this dimension supports evidence-based policymaking, cross-sectoral strategies, and targeted interventions, creating a holistic understanding of system performance to drive sustainable improvements in education systems.

To assist countries in evaluating their survey population systems within the education sector, the following self-assessment checklist focuses on key subcomponents:

1. Households surveys

- **Regularity**
  - How frequently are household surveys conducted within a specified period?
  - Is there a consistent schedule ensuring regular data collection?
  - Are the intervals between surveys sufficient to capture relevant educational change?

2. Labour Force Surveys

- **Regularity**
  - How often are labor force surveys administered during the specified period?
  - Is there adherence to a predetermined schedule for these surveys?
  - Do the intervals between surveys allow for effective monitoring of labor market trends affecting education?
- **Coverage of Major Dimensions of Inequality**
  - Do the surveys collect data disaggregated by key dimensions such as gender, socioeconomic status, ethnicity, and geographic location?
  - Is there comprehensive coverage of vulnerable or marginalized populations?
  - Are methodologies in place to ensure accurate representation of diverse groups?
- **Coverage of Major Education Issues (SDG 4 Indicators)**
  - Do the surveys include indicators related to Sustainable Development Goal 4, such as literacy rates, educational attainment, and access to quality education?
  - Is there alignment between survey questions and international education targets?
  - Are data collected on both formal and non-formal education sectors?

3. Population Census

- **Regularity and applicability**
  - Is the population census conducted at least every 10 years?
  - Does the census schedule align with international recommendations?
  - Does the census provide population projections by single age to support administrative data?
  - Are there provisions for conducting the census more frequently if needed?

7.4 Practical Examples

LASER allow for strategic inter agency alignment as Population Surveys fall commonly outside the scope of the Ministries of Education.

A common obstacle that countries face when assessing their data ecosystems is that educational data production is distributed or sometimes fragmented across different institutions or agencies. LASER has the advantage to allow countries to perform a Data Ecosystem Diagnostic or self-assessment of all dimensions, including those outside the direct purview of the Ministry of Education (e.g., surveys and international learning assessments).

Data fragmentation

Example 1: LASER and Inter Agency Alignment

A country is debating the national budget allocation for improving data production systems to strengthen the education sector. The Ministry of Education utilizes the LASER assessment and observes that while administrative data systems capture core educational variables effectively, achieving a high aggregated score, there are significant gaps in the National Household Survey, conducted biannually by the Bureau of Statistics. Specifically, the survey lacks sufficient data to monitor school attendance disaggregated by age, education level, and grade. Drawing on insights from LASER, the Ministry of Education successfully advocates to the Ministry of Finance for resources to pilot new survey questions. These additions aim to address the identified gaps, enhancing the overall quality and coverage of education data.

Contextualizing inequality in education:
LASER provides critical insights into how data production systems address major dimensions of inequality. This is a key component for policymakers to contextualize and prioritize public initiatives aimed at reducing disparities and ensuring equitable educational outcomes. Common gaps include the lack of socioeconomic, geographic (e.g., rural vs. urban), or other demographic variables essential for monitoring inequality and its impact on educational trends.

Example 2: Labour Force Survey with limited focus on inequality

Upon analyzing the LASER, the country observed a high Survey Population data score, primarily due to the country's robust biannual Labour Force Survey, which effectively captures school attendance. However, the Inequality Index was notably low. Further investigation revealed significant gaps in collecting data on socioeconomic status and other critical dimensions of inequality. To address this, the National Bureau of Statistics designed an enhanced socioeconomic questionnaire to be piloted in the next Labour Force Survey, incorporating variables such as parental education levels and income quintiles. This improvement enables a more detailed understanding of disparities, allowing policymakers to monitor educational inequality trends more effectively and design targeted interventions, thereby aligning the country's data systems with SDG 4's equity-focused indicators.

Surveys Population System: policy questions

1. **Do all kids have access to school? Is access to education equitably distributed?**
   Understanding access disparities helps identify and address barriers that may prevent certain children, particularly marginalized or disadvantaged groups, from attending school.

2. **What factors contribute to the incidence of out-of-school children?**
   By collecting data on socio-economic factors, cultural influences, and regional disparities, policymakers can identify the root causes of children being excluded from education. Understanding these dynamics through household survey data is crucial to design targeted policies to address these barriers, promote inclusivity, and advance SDG4 objectives.

3. **How are labor market outcomes related to educational attainment?**
   By examining the relationship between education and employment outcomes, policymakers can identify skill gaps and align educational and training programs with the demands of the labor market, fostering more effective education-to-employment transitions.

4. **What is the adult literacy rate?**
   The adult literacy rate is a key metric for measuring a nation's progress and well-being. It provides insight into the effectiveness of past and current education policies and initiatives, allowing policymakers to make informed decisions for improving literacy rates.

8. Expenditure component

Financial and expenditure data contain information on multiple sources of income and expenditure, including government expenditure on education, encompassing data on construction and maintenance of schools, teacher salaries and household spending on education, including supplies, transport and other costs.

Data on public spending on education typically includes budgets, funding sources (national or international), and spending patterns related to various aspects of education, such as infrastructure development and maintenance, teacher salaries, supplies, curriculum development, student services, and school feeding programs. Data on private household spending on education includes information on tuition fees, textbooks, school supplies, and private tutoring.

Data on education expenditure comes from administrative records often gathered by the Ministry of Finance, Ministry of Education or National Statistical Offices. Data on household expenditure is derived from expenditure surveys typically administered by NSOs and which could help quantify household out-of-pocket expenditure in education across socioeconomic groups and contribute to designing policies that ensure affordable and equitable access to education.

Finance and expenditure data serves as a crucial component for evaluating the efficiency, equity, and sustainability of educational initiatives and aids in making informed decisions regarding resource allocation and financial planning within the education sector. It helps policymakers understand how funds are being utilized and whether they are effectively contributing to their national education agendas and SDG4 objectives while promoting affordable and equitable access to education for all. This, in turn, facilitates efficient resource management and the allocation of budgets to areas that require the most attention.
Table 8.1 presents a list of SDG 4 indicators that can be estimated using expenditure data.

Table 8.1.
SDG indicators that can be derived from expenditure data by variables needed for their calculation

Status	Indicator
Framework for Action	Government expenditure on education as a percentage of the GDP
Global	1.a.2 Proportion of total government spending on essential services (education, health and social protection)
Thematic	4.5.5 Percentage of total aid to education allocated to least developed countries
Global	4.b.1 Volume of official development assistance flows for scholarships by sector and type of study

Source: UNESCO Institute for Statistics

Note: The following indicators are calculated using different sources, including expenditure data: 4.5.4 - 4.5.6.

8.1 Challenges and potential solutions

The calculation of expenditure indicators is affected by three main challenges:

1. **Coverage:** Expenditure indicators have low coverage, except for total public expenditure, though reporting the latter by level of education is low. The lowest coverage is for private expenditure.

2. **Conflicting data sources for public expenditure:** IMF GFS data are the preferred source of this indicator, but their coverage is limited and other data sources are being used. Many countries have multiple official estimates of education expenditure as a percentage of total government expenditure - IMF GFS, UIS, World Bank BOOST, national budget figures and the OECD – and these different data sources often provide different estimates.
3. **Private expenditure measurement:** These data have limited coverage, especially for household expenditure in low- and middle-income countries. The main limitation for household survey data sources is the lack of comparability of reported household expenditure across countries: this includes differences in whether expenditure is collected for a specific child or the household, the recall period, and in items included under education that households are asked to report on.

8.2 Expenditure on education sub-components

Three dimensions or sub-components are taken into account in this first version of LASER for a total score component (E) of 10% of total LASER score. They are summarized **table 8.2**.

- Response to UIS Education Survey in the period
- Government expenditure on education data is publicly available.
- Availability of private expenditure in the period

Table 8.2.
Expenditure on education: component and sub-components weights

Expenditure on education	0.1	
Response to UIS Education Survey in the period		0.60
Government expenditure on education data is publicly available		0.15
Availability of private expenditure in the period		0.25
Total		**1.00**

Source: UNESCO Institute for Statistics (UIS)

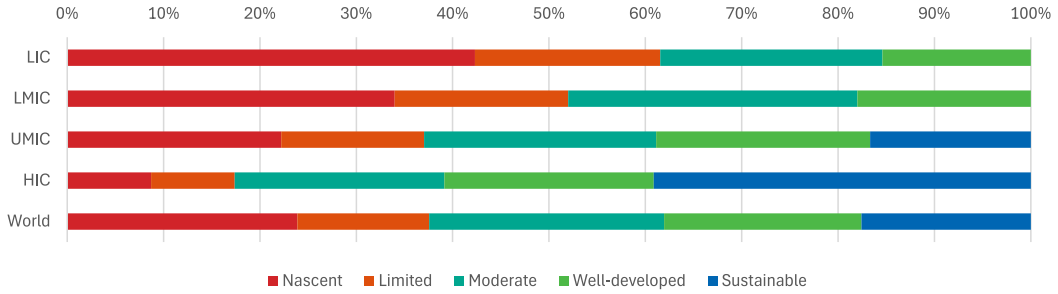
Figure 8.1 highlights a significant disparity in expenditure reporting based on country income groups, showing a strong positive correlation between a nation's income level and its statistical capacity. Wealthier nations tend to have more developed and sustainable statistical systems, whereas lower-income countries often struggle with limited capacity. This gap has major implications for evidence-based policymaking and tracking progress toward development goals.

In **Low-Income Countries (LICs)**, the most striking issue is the widespread lack of basic statistical infrastructure, which severely hampers fundamental data collection. While a small number of LICs demonstrate "Moderate" or even "Well-developed" capacity, the overall picture underscores the significant challenges these nations face in generating reliable data.

Figure 8.1.

Distribution of statistical capacity by ''Expenditure' component and country income group

Percentage of countries by statistical capacity



Source: UNESCO Institute for Statistics (UIS).

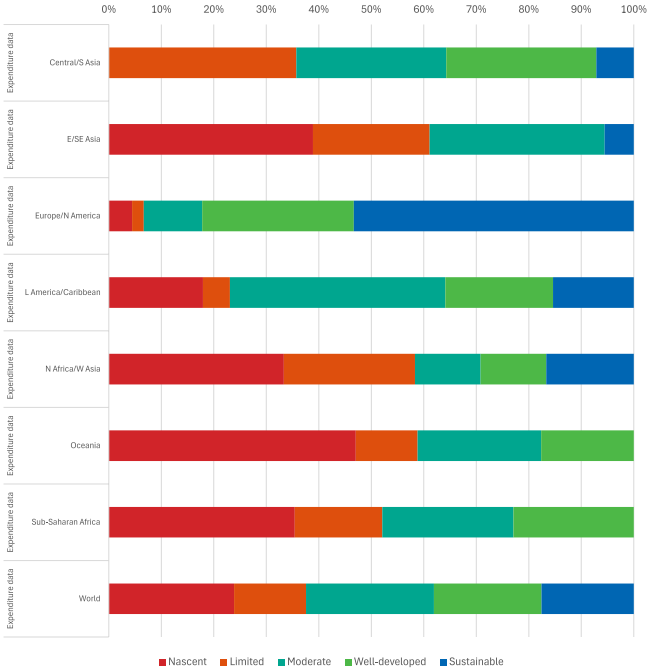
Lower-Middle-Income Countries (LMICs) exhibit a transitional phase, with a larger proportion classified as having "Moderate" capacity. However, "Limited" capacity remains prevalent, indicating that while progress is being made, substantial efforts are still required to enhance data reporting systems.

In contrast, Upper-Middle-Income Countries (UMICs) display a more balanced distribution of statistical capacity, while High-Income Countries (HICs) benefit from well-established, robust systems.

Analysis by SDG region **(Figure 8.2)** aligns with the findings based on income groups. Europe and North America stand out with a dominant share of "Sustainable" capacity. Latin America and the Caribbean show a more balanced distribution, reflecting both progress and areas that require further development to establish long-term, sustainable systems.

Figure 8.2. Distribution of statistical capacity by 'Expenditure' component and SDG region

Percentage of countries by statistical capacity



Source: UNESCO Institute for Statistics (UIS)

Meanwhile, **Central Asia, East and Southeast Asia, and Northern Africa/Western Asia** predominantly fall into the "Moderate" category. While these regions have made notable advancements in data collection and analysis, a significant share still struggles with "Limited" capacity, indicating ongoing challenges in fundamental data reporting.

Oceania presents a mixed picture, while **Sub-Saharan Africa** emerges as the most concerning region. Many countries in this region fall into the "Nascent" and "Limited" categories, lacking the infrastructure and resources necessary for reliable data collection and analysis, particularly in education expenditure. Although some nations demonstrate "Moderate" capacity, the overall scenario highlights the urgent need for investment in statistical capacity building.

8.3 Self-assessment checklist

The Expenditure self-assessment checklist focuses on evaluating the financial aspects of a country's education system. This includes assessing the regularity of responses to the UNESCO Institute for Statistics (UIS) Education Survey, the public availability of government expenditure data, and the inclusion of private education spending. By examining these components, policymakers can determine whether education is being adequately funded and identify areas for improvement. Transparent and comprehensive financial data are essential for informed decision-making and ensuring that resources are allocated effectively to meet educational goals.

To assist countries in evaluating their education expenditure data, the following self-assessment checklist focuses on key subcomponents:

1. International reporting
   - Has the country consistently reported to custodian agencies ?
   - Are the data submissions complete, accurate, and submitted within the established deadlines?
   - Is there a designated team or individual responsible for coordinating and submitting responses to the UIS Education Survey?

2. Public Availability of Government Expenditure on Education Data
   - Is data on government expenditure for education publicly accessible?
   - Are these data detailed, including breakdowns by education levels (e.g., primary, secondary, tertiary) and types of expenditure (e.g., salaries, infrastructure, resources)?
   - Is the expenditure data updated regularly and available through official publications or online platforms?

3. Availability of Private Expenditure Data
   - Does the country collect and report data on private expenditure in education, such as household spending, private sector contributions, and non-governmental organization funding?
   - Are these data integrated into national education financial reports to provide a comprehensive view of total education spending?
   - Is there a mechanism to regularly update and publish private expenditure data?

8.4 Practical Examples

Example 1: Ministry of Finance and Education collaboration using LASER

Recognizing the need for a comprehensive understanding of education funding, the Ministry of Education collaborated with the Ministry of Finance to integrate private educational expenditure data into national financial reports. Utilizing the LASER tool, they identified gaps in existing data collection, particularly concerning household spending and private sector contributions. By combining resources and expertise, the ministries developed a unified database that encompassed both public and private education expenditures. This collaborative effort provided policymakers with a holistic view of total education spending, enabling more informed decisions and effective allocation of resources to enhance educational outcomes.

Example 2: Case study: Making the case for increased investment in education – The challenge of stagnant funding in country A

For over a decade, education financing in Country A has remained stagnant, despite growing disparities in out-of-school children, foundational learning gaps, and limited TVET opportunities. While the Ministry of Finance sees education as well-funded compared to other social sectors, the reality is that almost the entire education budget is absorbed by teacher salaries, leaving little to no resources for school improvement, teaching materials, or teacher professional development.

The School Improvement Grants (SIGs), which provide funding per student, have not increased in over ten years, despite rising inflation and post-COVID economic challenges. With no adjustments for living costs, schools struggle to provide even the most basic resources. Private sector involvement in education financing has been minimal, and households contribute more than the government, making education increasingly unaffordable for poor families.

Policy Action Required: The Minister of Education must urgently advocate for increased investment in quality, equitable, and inclusive education. Key actions include:

1. Demonstrating the return on investment (ROI) in education – Evidence shows that every additional year of schooling increases earnings and economic productivity, reduces poverty, and improves social stability.

2. Addressing transparency concerns on school grants – Strengthening accountability mechanisms for SIGs can build trust and ensure that funds are well-utilized, making a stronger case for increased allocations.

3. Reforming budget priorities – A shift in funding to ensure resources for teacher training, TVET expansion, and learning materials is essential to improving learning outcomes.

4. Engaging the private sector – Developing Public-Private Partnerships (PPPs) can mobilize additional funding while reducing the burden on household contributions.

5. Aligning with global financing trends – Many countries are increasing education spending as part of post-COVID recovery, and Country A risks falling behind without urgent investment.

Without immediate policy shifts, Country A faces:
- Worsening learning gaps, leading to a less skilled workforce.
- Increased dropouts, widening inequality in access to education.
- A growing burden on households, making education even less affordable for the poor.

This is a critical moment for the Ministry of Education to present a strong, evidence-backed case to the Ministry of Finance, emphasizing that strategic investment in education is not just a cost—it is an investment in national development, economic growth, and long-term stability.

Example 3: Aligning education expenditure with LASER principles – Country A's path to sustainable financing

Country A faces a critical impasse in education financing: stagnant budgets for over a decade, with 90% of funds consumed by teacher salaries, leaving minimal resources for school infrastructure, learning materials, and teacher development. School Improvement Grants (SIGs) remain unchanged since 2013, failing to account for inflation and post-COVID economic pressures. Heavy reliance on household contributions exacerbates inequities, pushing education out of reach for low-income families. This misalignment starkly contrasts with LASER's principles of **equitable, efficient, and sustainable education financing**, threatening progress toward SDG 4.

LASER-aligned policy actions

1. Demonstrate return on investment (ROI) in education
- o LASER principle: Efficient Resource Allocation
- o Action: Use longitudinal data to quantify education's ROI—linking additional schooling years to higher earnings, poverty reduction, and economic growth. Present cost-benefit analyses to the Ministry of Finance to justify reallocating funds to high-impact areas (e.g., foundational learning, TVET).

2. Strengthen SIG transparency and accountability
- o LASER principle: Transparent Expenditure Monitoring
- o Action: Implement digital tracking systems for SIGs, publishing real-time disbursement data. Conduct third-party audits to ensure funds reach schools, rebuilding trust for increased allocations.

3. Reform budget priorities for equity and quality
- o LASER principle: Equitable and Strategic Allocation
- o Action: Shift funding toward teacher training (structured pedagogy), learning materials, and TVET expansion. Introduce weighted funding formulas to prioritize marginalized regions.

4. Mobilize private sector partnerships
- o LASER principle: Leveraging Alternative Financing
- o Action: Develop PPPs for infrastructure (e.g., climate-resilient schools) and digital learning tools. Offer tax incentives to businesses investing in STEM education and scholarships for low-income students.

5. Align with global financing innovations
- o LASER principle: Sustainable and Modern Financing
- o Action: Adopt mechanisms like education bonds, diaspora crowdfunding, and green financing for school infrastructure. Benchmark against nations allocating 15-20% of public budgets to education post-COVID.

Impact and lessons learned
- • Efficiency gains: Reallocating 15% of salary budgets to materials and training reduced learning poverty by 20% in pilot regions.
- • Equity improvements: PPPs cut household contributions by 30%, enabling 50,000 low-income students to re-enroll.
- • Sustainability: A diversified funding mix (public-private-donor) secured $50M for digital infrastructure, aligning with SDG 4.a (safe, inclusive schools).

LASER alignment checklist

LASER sub-component	Country A's Progress
Equitable allocation	Weighted funding formulas prioritized rural and conflict-affected schools.
Transparent monitoring	Public SIG dashboards increased accountability, reducing fund leakage by 40%.
Sustainable financing	Education bonds raised $20M for TVET centers, aligned with labor market needs.
Alternative financing	PPPs funded 100+ solar-powered schools, reducing energy costs by 60%.

Country A's journey illustrates how aligning expenditure with LASER principles transforms education from a fiscal burden to a growth engine. By prioritizing efficiency, equity, and innovation, the Ministry of Education can secure sustainable financing, close learning gaps, and drive national development. Without urgent action, Country A risks entrenching inequality and stifling economic progress outcomes antithetical to LASER's vision of equitable, resilient education systems.

Expenditure in education: policy questions

1. SDG 4 alignment and resource mobilization

1. What percentage of GDP and total government budget is allocated to education, and how does this compare to SDG 4's recommended benchmarks? (SDG 4.5, 4.b)
2. How does expenditure prioritize climate-resilient infrastructure (e.g., green schools, renewable energy) and climate education (SDG 4.7)?
3. Are multi-year budgets in place to sustain post-COVID reforms (e.g., hybrid learning systems)? (SDG 4.4, 4.a)
4. How are public-private partnerships (PPPs) or diaspora funds leveraged to scale innovations (e.g., EdTech, green skills training)? (SDG 4.b, 4.c)

2. Equity and inclusion

1. What funding mechanisms ensure free and equitable primary/secondary education (e.g., abolishing hidden fees)? (SDG 4.1)
2. How are funds weighted to reduce disparities between urban/rural schools? (SDG 4.5)
3. What share of the budget targets inclusive education (e.g., Braille materials, sign-language interpreters)? (SDG 4.5, 4.a)
4. How does funding address linguistic diversity (e.g., mother-tongue instruction)? (SDG 4.5)
5. Are there audits to ensure funds for marginalized groups (refugees, low-income students) reach intended beneficiaries? (SDG 4.5)

3. Quality and learning outcomes

1. What proportion of funding is allocated to foundational skills (literacy/numeracy) and post-pandemic learning recovery? (SDG 4.6)
2. How much is invested in teacher training (including climate education and digital literacy)? (SDG 4.c)
3. What investments modernize curricula (e.g., climate action, digital skills)? (SDG 4.7)
4. Is there a budget for monitoring/evaluation to assess program cost-effectiveness? (SDG 4.1, 4.7)

4. Demand-side access and affordability

1. What proportion of the budget supports financial incentives (scholarships, cash transfers) for marginalized groups (girls, refugees)? (SDG 4.5, 4.b)
2. How are indirect costs (transportation, menstrual hygiene) covered to improve attendance? (SDG 4.1, 4.5)
3. What is the impact of household contributions (fees, uniforms) on access, and how are these mitigated? (SDG 4.1)

5. Supply-side efficiency and infrastructure

1. What is the breakdown of recurrent vs. capital expenditures (e.g., salaries vs. green infrastructure)? (SDG 4.a)
2. How much is allocated to teacher recruitment/retention, especially in STEM and green sectors? (SDG 4.c)
3. What percentage of the budget supports school maintenance vs. climate-resilient infrastructure? (SDG 4.a)

6. Crisis preparedness and climate action

1. Are contingency funds reserved for emergencies (e.g., pandemics, climate disasters) to ensure learning continuity? (SDG 4.a)
2. How does funding prepare schools for climate shocks (e.g., flood-resistant buildings, renewable energy)? (SDG 4.7, 4.a)
3. What investments ensure hybrid learning (digital + in-person) for future disruptions? (SDG 4.4)

7. Partnerships and innovation

1. How do PPPs engage the private sector in financing climate-smart schools or digital infrastructure? (SDG 4.b, 4.7)
2. What role do diaspora networks play in funding education innovations (e.g., vocational training)? (SDG 4.b)
3. Are accountability frameworks in place for PPPs to align with SDG 4 equity goals? (SDG 4.5, 4.b)

9.Review and monitoring

Review and monitoring are critical elements of effective education systems, ensuring transparency, accountability, and continuous improvement. Transparent and accessible education data enhance public trust and encourage multi-stakeholder participation in policy discussions. The publication of essential education information promotes a culture of evaluation and improvement. Regular review mechanisms against defined targets ensure that resources are efficiently allocated and that disparities in education are promptly identified and addressed.

The 'Review and monitoring' LASER component includes three sub-components:

- Benchmarks for education indicators published by the UIS
- National education plans are publicly available and have quantitative target
- National indicators reports are published by ISCED level

A robust review and monitoring framework relies on transparency and comprehensive data sharing. Countries are encouraged to publish their education data regularly, ensuring that national indicator reports, disaggregated by ISCED levels, are accessible. This facilitates informed policymaking and enables stakeholders to track progress toward national and global education goals. Publicly available data ensure that education systems remain responsive to societal needs. By making data widely available, governments enhance accountability and empower civil society, educators, and policymakers to advocate for evidence-based reforms. However, the commitment to transparency must be balanced with safeguarding individuals' right to privacy, ensuring that data publication adheres to ethical standards and legal frameworks.

Publishing education indicators reports is essential for ensuring accountability, transparency, inclusion and data-driven policymaking. These reports enable progress monitoring, hold authorities accountable, and drive continuous improvements in education systems. By fostering transparency, they build trust among citizens, international partners, and funding agencies. They also ensure accountability by tracking progress against benchmarks, identifying gaps, and encouraging policymakers to enhance performance. Additionally, publishing such reports promotes public engagement, empowers stakeholders, and helps evaluate the long-term impact of education policies, supporting ongoing advancements in education systems.

National benchmarks in education

Quantitative targets play a vital role in tracking educational progress and informing policy decisions. The Education 2030 Framework for Action called on countries to establish "appropriate intermediate benchmarks (e.g. for 2020 and 2025)" on the way to achieving SDG 4, seeing them as "indispensable for addressing the accountability deficit associated with longer-term targets" (§28). **Table 9.1** provides a list of the eight benchmark indicators.

Setting benchmarks as intermediate points cannot be done at the global level because countries have set off from very different starting . Benchmarks can promote policy dialogue within and across countries based on a common understanding of a minimum threshold to be achieved. It is not straightforward to set benchmarks for all of these indicators. First, knowledge about national, regional and global past trends is still limited. Second, the factors influencing change at the country level (as opposed to a few schools subject to 'experiments') are poorly understood.

Table 9.1.
Benchmark indicators

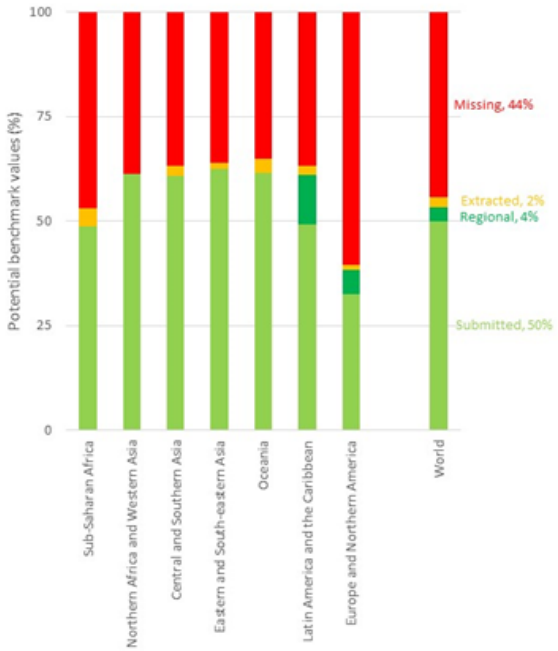
Benchmark indicator	Status	Name
Indicator 4.2.2	Global	Participation rate one year before primary
Indicator 4.1.4	Thematic	Out-of-school rate
Indicator 4.1.2	Global	Completion rate
Related to 4.5.1	Related to Global Indicator 4.5.1	Gender gap, completion rate in upper secondary
Indicator 4.1.1	Global	Minimum learning proficiency
Indicator 4.a.1	Global	Schools connected to the Internet
Indicator 4.c.1	Global	Trained teachers
Indicator 1.a.2 and Education 2030 benchmarks	Global	Education expenditure

* *In 2022, the Transforming Education Summit (TES) proposed to add three more benchmark indicators to capture some of the Summit's Global commitments for education transformation – youth participation, greening education, and digital transformation not in the benchmark indicator set: following this, school internet connectivity was adopted as the eighth benchmark indicator in 2023.*

There are minor regional differences, as five of the seven SDG regions have about the same submission rates (61%). The two regions lagging behind are sub-Saharan Africa (49%) and Europe and Northern America (38%). In sub-Saharan Africa, the lowest submission rates (18%) are for the minimum level of proficiency at the end of lower secondary education, which is not surprising considering that hardly any country in the region currently monitors learning outcomes at that level. In Europe and Northern America, the lowest submission rates (13%) are for the minimum level of proficiency in early grades and for trained teachers (32%) (**Figure 9.1**).

In 2021, when countries received the first invitation to submit national benchmark values, a template was provided with which they could set benchmarks if they had no national targets. The template included baseline and recent values but also offered two indicative values for their consideration, indicating where countries would be: (a) if they continued at the historical average progress rates (minimum benchmark); and (b) if they followed the historical progress rates of the fastest improving 25% of countries (feasible benchmark).

Figure 9.1.
Distribution of potential 2025 benchmark values, by region



Source: UNESCO Institute for Statistics and Global Education Monitoring Report. 2024. SDG 4 scorecard progress report on national benchmarks: focus on teachers. https://unesdoc.unesco.org/ark:/48223/pf0000388411

Technical challenges: data issues

During the benchmark-setting process, various data-related issues emerged, including differences in understanding between the UIS and countries on, for example, indicator definitions, information sources and school-age populations. In some cases, these differences led to inconsistencies between the baseline values in international comparative data and those used by countries at the national level. In turn, such inconsistencies may prevent a shared understanding of the ambition of benchmark values.

The full set of benchmark values is a combination of two parallel processes:

- The vast majority of benchmarks were submitted directly by countries. Of those, most are based on the source recommended in the SDG 4 indicator metadata. However, some submissions use other sources which were preferred by the individual countries.
- Some benchmarks were extracted from national sector plans, voluntary national reviews and related documents, which sometimes used different indicator definitions and data sources.

For every submission, values were checked in terms of:

- Baseline and latest value consistency: Consistency was checked between different indicators that are conceptually linked (e.g. out-of-school and completion rates), but also within indicators across levels.
- Methodology: Differences were mostly found with three indicators: the early childhood education participation rate, out-of-school rate and completion rate.

- Data source. There were also different data sources. For instance, the standard source for the out-of-school rate of primary school age children is administrative data collected by the UIS. However, among 57 countries, 17 countries used household survey data, 1 country used administrative data different to those reported to the UIS and 11 countries used unknown data, instead of UIS administrative data. By contrast, there was less variation among 54 countries on trained pre-primary teachers, where all but 6 used UIS administrative data.

In the case of benchmarks that were directly sourced from documents, target values set by countries for benchmark (or proxy) indicators were reviewed. A total of 392 documents were reviewed, mainly education sector plans, of which 99 contained quantitative targets. The metadata reviewed included:

- Calculation methodology: Some countries use national population and GDP data (which differ from those of the United Nations Population Division and the World Bank), national school age definitions (which differ from the International Standard Classification of Education) or report data only on public institutions.
- Use of proxy indicators: For example, net enrolment rates were used as a proxy for out-of-school rates.
- Availability of targets at the required level of disaggregation: For example, lower and upper secondary were often reported together. In such cases, target values reported for total secondary were used as a proxy for both lower and upper secondary.

9.1 Challenges and potential solutions

Despite progress, review and monitoring face several challenges.

Challenges in data publishing and sharing

- **Data availability**, quality and timeliness: Inconsistent or incomplete data collection, gaps, and reporting delays hinder effective monitoring and timely decision-making.
- **Capacity and resources:** Limited technical expertise, financial constraints, and institutional weaknesses affect data collection, analysis, and use.
- **Privacy and ethical concerns:** Safeguarding sensitive data related to students and educators remains a challenge, requiring strict privacy protection measures.
- **Political and institutional barriers:** Reluctance to publish unfavorable education data for political reasons can undermine transparency, accountability, and public trust.

Challenges in setting national quantitative targets

- **Missing benchmarks:** While most countries participate in setting national benchmarks, many have not submitted targets for all key indicators due to a lack of familiarity with the process which is relatively new or to political hesitancy.
- **Relevance of indicators:** Some benchmark indicators may not be applicable in certain national contexts, particularly if the target has already been met or does not align with national priorities.
- **Ambition of targets:** Some national targets may be either too ambitious or too conservative, limiting their effectiveness in driving meaningful progress.
- **Inconsistencies in methodology:** Countries may use different definitions, calculation methodologies, or data sources for benchmarks than those used for SDG 4 reporting, leading to discrepancies in progress assessment.
- **Limited data disaggregation:** Some benchmark indicators require data breakdowns (e.g., by gender, region, or income level), which may not always be available at the national level.
- **Monitoring and reporting gaps:** Frequency of data collection and progress reporting varies, with some indicators not collected or only updated every few years, causing delays in assessing improvements.
- **Lack of communication and support:** Countries require clearer guidance, technical assistance, and mechanisms for clarifying or contesting progress assessments.

9.2 Review and monitoring sub-components

Three dimensions or sub-components are taken into account in this first version of LASER for a total score component (R) of 15% of total LASER score. They are summarized in **table 9.2**.

- Benchmarks for education indicators published by the UIS
- National education plans are publicly available and have quantitative target
- National Indicators reports are published by ISCED level

Table 9.2.

Review and monitoring: Component and sub-components weights

Review and monitoring progress	0.15	
Benchmarks for education indicators published by the UIS		0.70
National education plans are publicly available and have quantitative target		0.15
National Indicators reports are published by ISCED level		0.15
Total		**1.00**

Source: UNESCO Institute for Statistics (UIS)

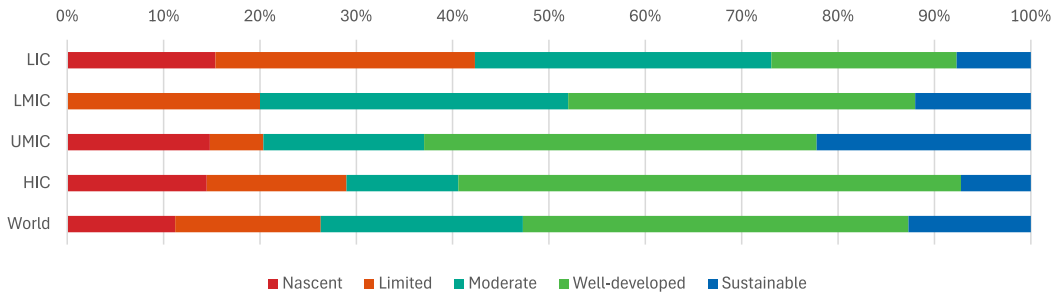
An analysis of Review and Monitoring statistical capacity maturity across different countries is presented in Figures 9.2 and 9.3 by income level and SDG region.

Analysis of statistical capacity by income shows that higher-income countries tend to have more advanced statistical capacity for Review and Monitoring, while lower-income countries exhibit more limited development and face significant challenges. Low-income countries (LICs) are primarily characterized by “Nascent” and “Limited” capacity, indicating significant gaps in statistical maturity. Lower-middle-income countries (LMICs) demonstrate some progress, with a larger share in the “Moderate” category. Upper-middle-income countries (UMICs) show a substantial shift toward “Well-developed” and “Sustainable” statistical capacity, reflecting improved capabilities. High-income countries (HICs) predominantly fall within the “Well-developed” and “Sustainable” categories, showcasing advanced and mature statistical systems.

Figure 9.2.

Distribution of statistical capacity by ‘Review and monitoring’ component and country income group

Percentage of countries by statistical capacity



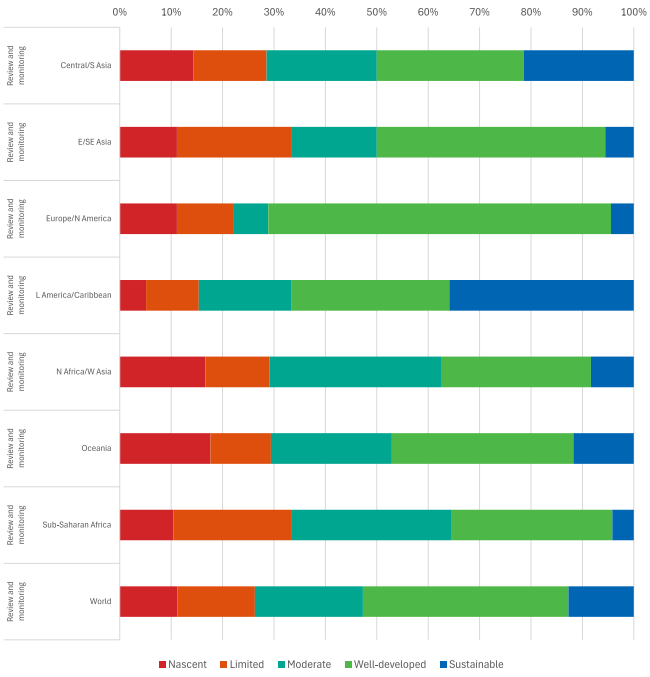
Source: UNESCO Institute for Statistics (UIS)

Analysis of statistical capacity by SDG region shows regional disparities. Sub-Saharan Africa and East/Southeast Asia exhibit the highest concentration of countries in the “Nascent” and “Limited” categories, reflecting persistent challenges in statistical development. Latin America/Caribbean is the region with the highest percentage of countries with “Sustainable” capacity whereas Europe/North America is the region with percentage of countries with “Well-developed” capacity. Northern Africa/Western Asia and Oceania have the highest percentage of “Nascent” capacity. These findings suggest that, while income level is a primary determinant of statistical capacity, regional factors also play a crucial role, with some regions facing unique challenges or benefiting from targeted investments in statistical capacity building.

Figure 9.3.

Distribution of statistical capacity by ‘Review and monitoring’ component and SDG region

Percentage of countries by statistical capacity



Source: UNESCO Institute for Statistics (UIS)

9.3 Self-assessment checklist

The Review and Monitoring Data self-assessment checklist evaluates whether benchmarks for education indicators are published by the UIS, national education plans with quantitative targets, are publicly available, and national indicator reports are accessible and disaggregated by ISCED levels.

To assist countries in evaluating their review and monitoring processes within the education sector, the following self-assessment checklist focuses on key subcomponents:

1. Benchmarks for Education Indicators Published by the UIS
- Has the country adopted and integrated the benchmarks for education indicators as published by the UNESCO Institute for Statistics (UIS)?
- Are these benchmarks available in national plans, and considered in national education planning and policy formulation?

2. National education plans with quantitative targets
- Does the country have a current national education plan that is publicly accessible?
- Are specific, measurable, achievable, relevant, and time-bound (SMART) quantitative targets included in the plan?
- Is there a process for monitoring progress toward these targets, and are the results publicly reported?

3. National indicator reports published by ISCED Level
- Are national education indicator reports regularly published and disaggregated by International Standard Classification of Education (ISCED) levels?
- Do these reports cover key performance indicators, including enrollment rates, completion rates, and learning outcomes?
- Is the data in these reports used to inform policy decisions and educational interventions?

9.4 Practical Examples

When Data Production is high but monitoring efforts are challenging.

Example 1. Ambitious Educational Targets Undermined by Data Monitoring Challenges.

A newly elected administration, committed to advancing educational quality, developed an ambitious plan aligned with the Sustainable Development Goal 4 (SDG 4) framework. However, upon utilizing the LASER tool, they discovered significant challenges in tracking progress toward these goals. The analysis revealed substantial data gaps, with extended periods lacking comprehensive educational data, and existing assessments were found to be weak or inconsistent. These deficiencies hindered the ability to monitor progress over time effectively. To address these challenges, the administration prioritized integrating essential variables into the national education database, recognizing that robust data collection is fundamental for setting accurate benchmarks and measuring advancement. By strengthening their data production efforts, they aimed to establish a more reliable foundation for monitoring educational progress and informing policy decisions. This approach underscores the critical importance of comprehensive data systems in achieving educational objectives and highlights the need for continuous improvement in data collection and assessment methodologies.

Example 2: Strengthening National Education Policies and Plans – Lessons from Country X

Some background Context: In 2018, Country X launched a five-year Education Sector Plan (ESP) focused on improving learning outcomes, teacher effectiveness, and equitable access to education. By 2021, however, national reviews and international reporting frameworks indicated slow progress in reducing dropout rates and improving foundational learning. This raised concerns about whether the targets set were realistic and achievable or whether adjustments were needed to align with emerging national priorities and SDG 4 commitments.
Policy Action: To address these challenges, the Ministry of Education, in collaboration with the National Statistical Office (NSO), UIS, and key development partners, initiated a mid-term review of the ESP. The process involved:

- A comprehensive data analysis using administrative records, learning assessments, and household surveys to measure progress against national and international benchmarks.
- Stakeholder consultations, bringing together government agencies, civil society, and education specialists to evaluate sectoral priorities.
- Evidence-driven policy revisions, including:
  - Expanding targeted interventions for at-risk students to reduce dropout rates.
  - Enhancing teacher training in structured pedagogy and formative assessments.
  - Strengthening collaboration between education, health, and social protection services to support vulnerable learners.

Impact and Lessons Learned:
The revised Education Sector Plan (2023-2028) was developed based on realistic, evidence-based targets aligned with SDG 4 and national priorities. A structured annual education progress review was institutionalized, ensuring regular tracking and transparency of sector performance. The approach led to stronger inter-ministerial coordination, particularly between education, finance, and planning bodies, enhancing the integration of education into broader development frameworks. This case highlights how regular reviews and data-driven policy adjustments ensure that national education plans remain relevant, responsive, and effective.

Example 3: Strengthening Education Reporting and Transparency – The Case of Country Y

Background Context: Country Y historically faced challenges in publishing education data, leading to gaps in transparency, accountability, and informed decision-making. While administrative data was collected, it was neither systematically analyzed nor made publicly available, resulting in limited use for policymaking and sector planning. There was growing recognition that education reporting needed to be strengthened to ensure better monitoring and alignment with regional and global reporting frameworks, including UIS and SDG 4.
Policy Action: To address this, the Ministry of Education, in partnership with UIS and key national stakeholders, introduced a national education progress reporting system aligned with international monitoring standards. The approach included:

- Establishing a data dissemination policy, mandating the annual publication of education performance indicators, including learning outcomes, teacher qualifications, infrastructure, and financing.
- Ensuring data disaggregation by gender, location, and socioeconomic status to highlight equity gaps.
- Launching an open-access digital platform for real-time access to national education statistics.

Impact and Lessons Learned:
The first-ever National Education Progress Report (2024) was successfully published, featuring comprehensive analysis, infographics, and policy recommendations to enhance sector planning. The reporting system was integrated into the Education Management Information System (EMIS), allowing for real-time tracking of key education indicators. Public engagement significantly increased, with civil society, media, and policymakers actively using the data for advocacy and decision-making. This case illustrates how institutionalizing a transparent and structured reporting process strengthens education governance, accountability, and public trust.

Policy questions

National Education Policies and Plans

1. How often are national education plans (e.g., Education Sector Strategic Plans) reviewed and updated to reflect emerging priorities and challenges?
2. What mechanisms exist for monitoring progress against the quantitative targets outlined in national education plans?
3. How is data and evidence from the review process used to inform policy adjustments and decision-making?
4. What role do stakeholders (e.g., government, civil society, private sector) play in the review and monitoring of national education plans?
5. How are national education plans aligned with global and regional frameworks (e.g., SDG 4, CESA, NDP)?

Publishing and Reporting on Education Progress

1. How frequently are education progress reports published at the national level, and what key indicators do they include?
2. Are review findings and monitoring reports accessible to policymakers and the public, and how are they disseminated? (e.g schools and community report cards)
3. What strategies are in place to improve the visibility and usability of education data for advocacy and public discourse?
4. How do national reports contribute to regional and global education monitoring efforts (e.g., AU, UNESCO, UIS)?
5. What mechanisms ensure that published reports are disaggregated by gender, disability, location, and other equity dimensions?

10. Unpacking LASER Country Profile

The LASER Country Profile (CP), or **National Education Statistical Capacity Assessment based on a maturity model,** is an essential tool developed by UIS to assess and improve national education data ecosystems. By providing key performance metrics across multiple dimensions, the LASER CP offers a comprehensive assessment of a country's statistical capacity for SDG4 monitoring. This tool is critical for identifying strengths and weaknesses in national education data ecosystem, enabling countries to develop targeted action plans to enhance data quality, coverage, and alignment with SDG4 targets. Ultimately, the LASER CP supports countries in making informed decisions and driving progress towards achieving global and national education goals.

This chapter provides a structured, step-by-step guide to countries in understanding and utilizing their LASER CP. It walks readers through its various sections, helping them understand the components and metrics of the LASER CP and enabling them to:

- Evaluate the maturity of their education data ecosystems.
- Identify gaps and prioritize areas for improvement.
- Develop targeted action plans to strengthen data quality and coverage, as well as alignment with SDG4 targets.

10.1 LASER Country Profile: A self-evaluation tool

The LASER Country Profile functions as a self-evaluation tool enabling countries to:

- Assess the maturity of national education data ecosystems across five key components:
  1. Learning Assessments
  2. Administrative Data
  3. Survey Population System
  4. Expenditure on education
  5. Review and Monitoring.
- Identify gaps in data quality, coverage, and alignment with international standards.
- Provide actionable recommendations to strengthen education data systems and support evidence-based policymaking.
- Align national efforts with SDG4 targets to promote equitable and quality education

10.2 Steps to use the LASER Country Profile

The process of using a LASER CP involves three key steps: self-evaluation, identification of gaps, and development of action plans.

- **Step 1: Self-evaluation**

  1. Gather data: Collect data for each of the five LASER components and their sub-components using national education statistics, surveys, and administrative records. Ensure that the expanded dimensions such as bullying, home language, school connectivity, are covered.

  2. Score each component: Use the LASER scoring matrix to assign a score (0-100%) to each component based on the scores of its sub-components, including quality, coverage, and alignment.

  3. Determine maturity level: Compare the scores with the maturity levels (Nascent, Limited, Moderate, Well-developed, Sustainable) to assess the current status of each component.
- **Step 2: Identification of gaps**

  1. Review scores: Identify components with low scores or gaps in coverage (e.g., missing data on services in secondary schools, such as school connectivity; no data on enrolment in tertiary education; no quantitative targets in national education plans).

2. Prioritize areas for improvement: Focus on the most critical components for achieving SDG4 targets (e.g., improving learning assessments or expanding administrative data coverage).

- **Step 3: Development of action plans**

  1. Set targets: Define specific, measurable targets for improving data systems (e.g., increase the frequency of learning assessments; expand coverage of school infrastructure data; include quantitative measurable targets in national plans).

  2. Allocate resources: Identify the resources (financial, technical, human) needed to implement the action plans.

  3. Monitor progress: Establish a tracking system to measure progress toward the targets and adjust strategies as needed.

10.3 Structure of a LASER Country Profile

The LASER CP is structured as follows:

- **LASER summary scores:** Overview of maturity of country's overall education data ecosystem, as well as each of the five data sources, in comparison with the rest of the world, other countries in the region, as well as countries in the same income group.
- **Introduction of LASER tool:** Concise description of the tool's background, objectives, each of the five data sources and their subcomponents, and method of calculating the scores including weighting.
- **Country LASER score:** A graphic overview of a country's capacity to produce high-quality education data for SDG 4 monitoring, as represented by scores for each of the five data sources or components and their sub-components.
- **Data availability to monitor education-related SDGs:** A tabular overview of whether data were available for each of the education-related SDG indicators over the previous 10-year period.
- **Detailed assessments of five data sources:** For each of the following data sources, total score of the data source and the scores of the sub-components are presented, followed by detailed country responses that yielded the scores.
  - Learning assessments: Sub-components include the regularity of administration of learning assessments, coverage of education issues, coverage of inequality, and alignment with internationally accepted standards.
  - Administrative data: Sub-components include availability of ISCED 2011 mapping, country data reporting to UIS Education Survey in the preceding 10-year period, and data coverage indicators in EMIS forms.
  - Survey population systems: Sub-components include regularity of household surveys, labor force surveys and population censuses.
  - Expenditure on education: Sub-components include country data reporting to UIS Education Survey (Questionnaire B) and other indicators over the preceding 10-year period, availability of data on government expenditure on education, and availability of data on private expenditure on education in the period.
  - Review and monitoring: Sub-components include the extent to which national benchmarks for education indicators are published by UIS, national education plans being publicly available and containing quantitative targets, and national indicator reports are published by ISCED level.
- **Annexes:** A list of such key references as ISCED level definitions, SDG4 indicators, indicator by data sources in the national context, mapping of variables required for each of the SDG4 indicators and questionnaires, mapping of data forms of UIS Education Survey and SDG4 and other policy relevant indicators, completeness of country data reporting to UIS Education Survey, summary of data and metadata in the questionnaires of national school censuses and household surveys.

The rest of this document is a section-by-section walk through the LASER CP.

LASER Summary Scores

This section provides an overview of the maturity of a country's overall education data ecosystem, as well as each of the five data sources, in comparison with other countries. More specifically, the first two pages of the LASER Country Profile present the LASER summary scores based on the maturity model and include the following (**Figure 10.1**):

1. Overall score of the country and scores of each of the LASER dimensions or components, in comparison to the rest of the countries in the world.

2. Overall score of the country and scores of each LASER component, in comparison to the rest of the countries in the region to which the country belongs.
3. Overall score of the country and scores of each LASER component, in comparison to the rest of the countries in the World Bank Income group to which the country belongs

Figure 10.1.
LASER scores by SDG region and income level

Source: UNESCO Institute for Statistics (UIS)

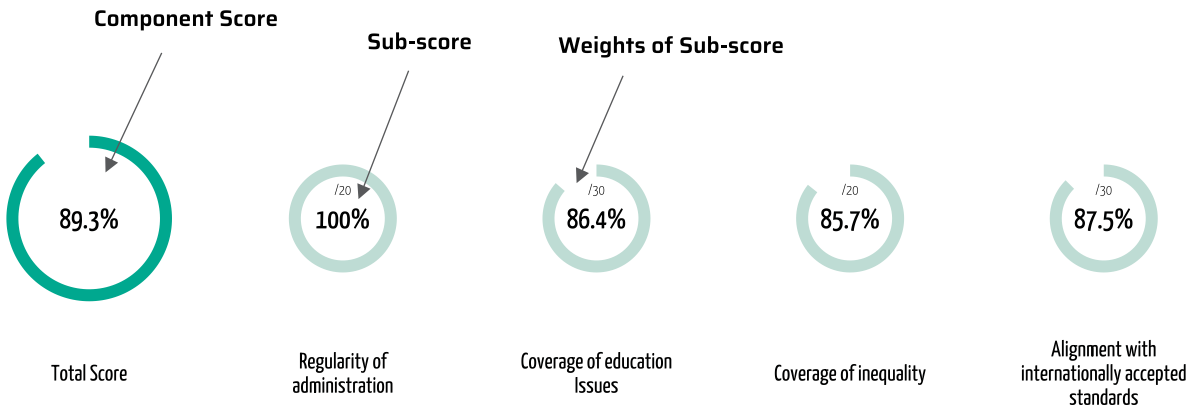
Introductory section

This section describes LASER's background, objectives, and components. It also explains the method of applying weights to calculate scores of individual components, with the example of "Learning assessments".
In the example, the LASER score of the 'Learning assessments' component (L) for a particular country is 89.3% (**Figure 10.2**). This score is derived from the scores of its four sub-components, each of which has a score based on evaluation. In addition, the four sub-components are each assigned the following weights:

- Regularity of administration: 20%
- Coverage of education issues: 30%
- Coverage of inequality: 20%
- Alignment with internationally accepted standards: 30%

Thus, the score for the component is calculated by summing the weighted sub-scores of the four sub-components, where each sub-score is multiplied by its respective weight.
Calculation of the total component (L) score: (100*0.20)+(86.4*0.30)+(85.7*0.20)+(87.5*0.30) = 89.3%

Figure 10.2.
Weighting system to calculate a LASER score



Source: UNESCO Institute for Statistics (UIS)

LASER score for a country

As illustrated in **Figure 10.3**, this section of the LASER CP presents:

- A country's overall LASER score, indicating the level of capacity of its education data ecosystem
- The component scores and their weights
- The sub-component scores and weights.

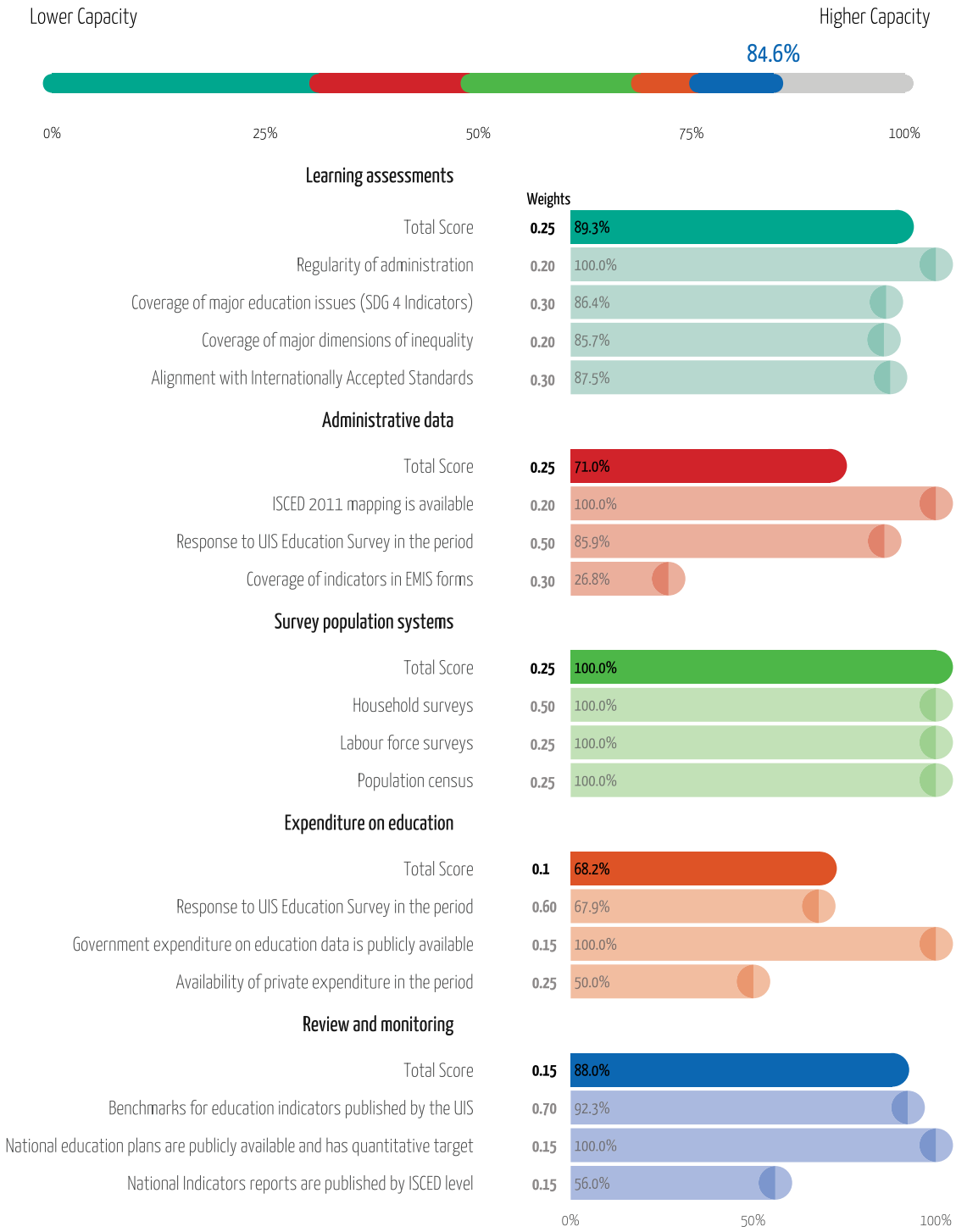
A detailed analysis of a country's aggregate LASER score and the scores of its components and sub-components provides insights into available educational resources and areas needing improvement.

Countries can use this analysis to:

- Sustain strengths in dimensions that scored 100% by maintaining best practices.
- Investigate weaknesses in areas scoring 0%, determining whether data is missing or simply unavailable at the national level.
- Explore lower-scoring dimensions, pinpoint specific gaps, and implement strategic improvements

Ultimately, LASER serves as a valuable tool for reflection and action. By using the insights it provides, all national education stakeholders can work together to build stronger, more effective, and impactful education data ecosystems.

Figure 10.3.
LASER Summary with overall country LASER score and individual component and sub-component scores



Source: UNESCO Institute for Statistics (UIS)

Example:
Calculation of a LASER score for country X

Table 10.1 illustrates how a LASER score is calculated. Country X's aggregate score (84.7%) is derived from the weighted scores of its five components:

- Learning assessments (89.3%, weight 0.25)
- Administrative data (71%, weight 0.25)
- Survey population systems (100%, weight 0.25)
- Education expenditure (64.7%, weight 0.10)
- Review and monitoring (88%, weight 0.15)

In other words, the final LASER score is the sum of each component's score multiplied by its respective weight.

Calculation of the total LASER score:
(89.3*0.25)+(71*0.25)+(100*0.25)+(64.7*0.1)+(88*0.15) = 84.7%

Source: UNESCO Institute for Statistics (UIS)

Table 10.1.
Calculation of a LASER score for country X

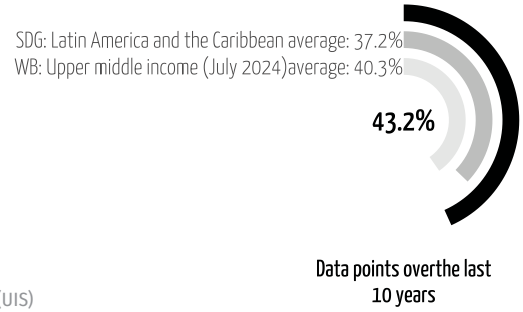
LASER components	Component Score (%) A	Com-ponent Weight B	Score by Weight (%) C=A*B
Learning assessments	89.3	0.25	22.3
Administrative data	71	0.25	17.8
Survey population systems	100	0.25	25.0
Expenditure on education	64.7	0.1	6.5
Review and monitoring	88	0.15	13.2
Total LASER Score (Sum of C)			**84.7**

Availability of the latest data to monitor the education-related SDGs

This section evaluates the country's SDG 4 data coverage from 2015 to 2024, highlighting data availability and gaps over time. The section has two parts.

The first part is a graph showing the percentage of available data points for the country over the total possible data points in the period, with reference to that of the countries in the SDG region and for the income group to which the country belongs. The graph facilitates meaningful comparisons with countries in the same grouping (**Figure 10.4**).

Figure 10.4.
Percentage of available data points for country X in comparaison with the SDG region and income group to which the country belongs



Source: UNESCO Institute for Statistics (UIS)

The second part of the section is a table showing if a data point is available for each of the SDG4 indicators for a specific year.[4] When an indicator could be calculated from different data sources, the availability of data points from each source is represented in a separate row. This is the case for instance for the out-of-school rate which can be calculated from administrative data, household surveys, and modeled data; also, for the completion rate which can be calculated from household surveys and modeled data **(Table 10.2)**.

4 Tables 2 and 3 in the Country Profile annex provide the full list of indicators and data sources.

Table 10.2.
Availability of data points from all data sources to monitor education-related SDGs from 2015 to 2024

◉ Available ○ Not Available

Indicator	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Any
4.1.2 Completion rate (primary education, lower secondary education, upper secondary education) - Lower secondary - mod	◉	◉	◉	◉	◉	◉	◉	◉	○	○	◉
4.1.2 Completion rate (primary education, lower secondary education, upper secondary education) - Primary - hhs	○	◉	◉	◉	◉	◉	○	○	○	○	◉
4.1.2 Completion rate (primary education, lower secondary education, upper secondary education) - Primary - mod	◉	◉	◉	◉	◉	◉	◉	◉	○	○	◉
4.1.2 Completion rate (primary education, lower secondary education, upper secondary education) - Upper secondary - hhs	○	◉	◉	◉	◉	◉	○	○	○	○	◉
4.1.2 Completion rate (primary education, lower secondary education, upper secondary education) - Upper secondary - mod	◉	◉	◉	◉	◉	◉	◉	◉	○	○	◉
4.1.3 Gross intake ratio to the last grade (primary education, lower secondary education)	◉	◉	◉	◉	◉	◉	◉	◉	○	○	◉
4.1.4 Out-of-school rate (1 year before primary, primary education, lower secondary education, upper secondary education) - Lower secondary - admin	◉	◉	◉	◉	◉	◉	◉	◉	○	○	◉
4.1.4 Out-of-school rate (1 year before primary, primary education, lower secondary education, upper secondary education) - Lower secondary - hhs	○	○	○	○	○	○	○	○	○	○	○
4.1.4 Out-of-school rate (1 year before primary, primary education, lower secondary education, upper secondary education) - Lower secondary - mod	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉
4.1.4 Out-of-school rate (1 year before primary, primary education, lower secondary education, upper secondary education) - One year before than official primary entry age - admin	◉	◉	◉	◉	◉	◉	◉	◉	○	○	◉
4.1.4 Out-of-school rate (1 year before primary, primary education, lower secondary education, upper secondary education) - Primary - admin	◉	◉	◉	◉	◉	◉	◉	◉	○	○	◉
4.1.4 Out-of-school rate (1 year before primary, primary education, lower secondary education, upper secondary education) - Primary - hhs	○	○	○	○	○	○	○	○	○	○	○

Source: UNESCO Institute for Statistics (UIS)

The table gives a quick review of the evolution and data gaps over time. Reasons for data gaps can be many. For instance, data for particular indicators may simply not be included in a country's data collection. Alternatively, reported data may not be published due to errors or inaccuracies, non-adherence to international standards, incompleteness, inconsistencies over time or imbalances.

Assessment of LASER components and sub-components

This section examines in detail each of the five LASER components and their sub-components:

Learning assessments

1. Regularity of Administration
2. Coverage of major education issues (SDG4 indicators)
3. Coverage of major dimensions of inequality
4. Alignment with internationally accepted standards

Administrative data

1. ISCED 2011 mapping available
2. Response to UIS Education Survey in the period
3. Coverage of indicators in EMIS forms

Survey population systems

1. Household Surveys
2. Labour Force Surveys
3. Population census

Expenditure on education

1. Response to UIS Education Survey in the period
2. Government expenditure on education data is publicly available
3. Availability of private expenditure in the period

Review and monitoring

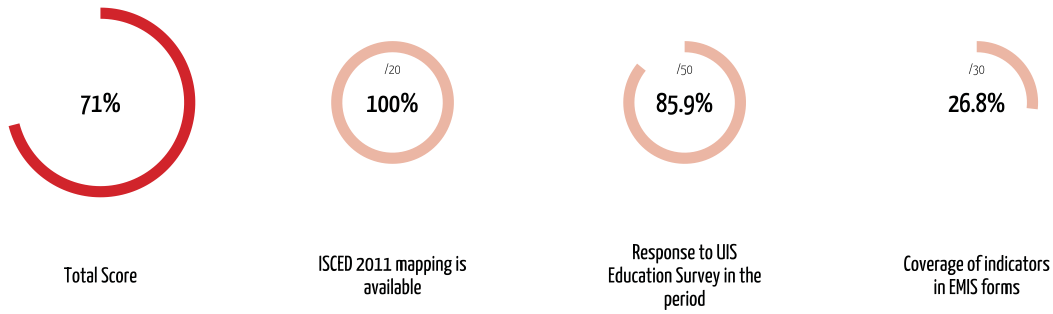
1. Benchmarks for education indicators published by the UIS
2. National education plans are publicly available and have quantitative target
3. National indicators reports are published by ISCED level

For every component, there is a figure that summarizes the total score of the component and the sub-scores of its sub-components, including their weights. This is followed by detailed tables for every sub-component which helps understand the overall score. Such detailed information on each sub-component allows statisticians and policymakers to understand better the situation and work on finding appropriate solutions.

Example: Administrative data component

Figure 10.5 shows the scores of the 'Administrative data' component and its sub-components for country X and **Table 10.3** shows the calculation.

Figure 10.5.
Score of 'Administrative data' component and sub-scores of its sub-components



Source: UNESCO Institute for Statistics (UIS)

Table 10.3.

Calculation of the score of the LASER component 'Administrative data' for country X based on the sub-scores of its sub-components

Sub-components of 'Administrative data'	Sub-score of sub-component (%) C	Weight of sub-component D	Vaues to calculate the component score (%) E=C*D
ISCED 2011 mapping available	100	0.2	20
Response to UIS Education Survey in the period	85.9	0.5	43
Coverage of indicators in EMIS forms	26.8	0.3	8
Total score of the 'Administrative data' component (Sum of column E)			**71**

Source: UNESCO Institute for Statistics (UIS)

As indicated in the **table 10.3**, the score of the administrative data component was calculated as the sum of the values we get when multiplying the sub-scores of the sub-components by their respective weights.
Score of A: (100*0.2)+(85.9*0.5)+(26.8*0.3) = 71%

The LASER country profile then provides an in-depth analysis of each of the administrative data sub-components revealing valuable information for statisticians and policymakers:

Sub-component 1. 'ISCED 2011 mapping available'[5]:

This sub-component reflects whether a country has an ISCED 2011 mapping or not and its weight is 0.2.

Country X scored 100% on this sub-component because its ISCED 2011 mapping is available.

Sub-component 2. 'Response to UIS Education Survey (QA and QC) and dynamic templates'[6]:

This sub-score captures the regularity, completeness and quality of the country's response to UIS questionnaires A and C and, for some countries, to the dynamic templates submitted to UIS.

This sub-component has the highest weight among the three sub-components of 'Administrative data' (0.5). The final sub-score of this sub-component is the average of the three averages of regularity, completeness, and quality in the period.

5 Table 1 of the annex of the country profile provides the name and description of every ISCED level.

6 For more information on the questionnaires used to collect data for the UIS Survey of Formal Education, please refer to this page: https://uis.unesco.org/en/uis-questionnaires

Country X scored 85.9% on this sub-component as seen in the table below.

Table 10.4.
Response to UIS Education Survey (Questionnaires A and C) and dynamic templates

This sub-score captures the regularity, completeness and quality of questionnaires A and C and, in some cases, dynamic templates submitted to UIS. The final sub-score is the average of the three averages of regularity, completeness and quality in the period.

Year	UIS Questionnaire	Regularity	Completeness of data points in questionnaire	Quality	Source
2015	A	100.0%	82.2%	97.5%	UIS Education Survey
	C	100.0%	91.2%	48.8%	UIS Education Survey
2016	A	100.0%	82.2%	97.5%	UIS Education Survey
	C	100.0%	90.1%	82.5%	UIS Education Survey
2017	A	100.0%	88.1%	97.5%	UIS Education Survey
	C	100.0%	86.6%	78.6%	UIS Education Survey
2018	A	100.0%	88.3%	97.3%	UIS Education Survey
	C	100.0%	89.6%	92.9%	UIS Education Survey
2019	A	100.0%	88.0%	97.3%	UIS Education Survey
	C	100.0%	86.6%	99.1%	UIS Education Survey
2020	A	100.0%	87.9%	97.3%	UIS Education Survey
	C	100.0%	86.6%	96.7%	UIS Education Survey
2021	A	100.0%	89.4%	99.1%	UIS Education Survey
	C	100.0%	80.7%	80.5%	UIS Education Survey
2022	A	100.0%	88.4%	99.1%	UIS Education Survey
	C	100.0%	80.8%	94.9%	UIS Education Survey
2023	A	0.0%	-	-	-
	C	0.0%	-	-	-
2024	A	0.0%	-	-	-
	C	0.0%	-	-	-
Partial Score	-	80.0%	86.7%	91.0%	-
Sub-score	**-**	**-**	**-**	**85.9%**	**-**

Source: UNESCO Institute for Statistics (UIS)

To understand why country X's sub-score is 85.9% on this sub-component, we need to look at the three elements which compose it: regularity, completeness and quality.

1) Regularity: Is the country regularly reporting data to the UIS?
UIS collects education data from countries annually through questionnaires A, B, C and ISCED of the Survey of Formal Education[7]. **Table 10.5** below provides a mapping of all indicators by UIS questionnaire and table. For example, it shows clearly that the calculation of SDG indicator 4.1.4, or the out-of-school rate, needs information collected in the ISCED questionnaire (T1), Questionnaire A (**tables A3, A5, and A6**), and questionnaire C (**table C5**).

7 An alternative mechanism, called the Dynamic Templates, has been offered for countries to report education data to UIS.

Table 10.5.

SDG 4 Indicators calculated from data collected through the UIS Survey of Formal Education, by questionnaire and table

OTHER POLICY RELEVANT INDICATORS	ISCED	QA						QB		QC			
	T1	A1	A2	A3	A5	A6	A9	B2	B3	C2	C6	C7	C8
Number of teachers							+						+
% of female teachers							+						+
School life expectancy	+			+									
Number of international mobile students											+		
Inbound and outbound rates of international mobile students										+	+		
Number of students			+	+						+			
Enrolment rates	+		+	+						+			
Graduation ratio, tertiary education	+											+	
% of tertiary graduates by field of education												+	
Repetition rate					+	+							
Number of OOS children and adolescents	+			+						+			
Public education expenditure by nature									+				
% of students by programme orientation			+										
% enrolment in private institutions			+										
Government expenditure in education (amount)								+					
Survival rate					+	+							
School age population	+												
Start and end of academic school year		+											

Source: UNESCO Institute for Statistics (UIS)

A detailed mapping of UIS questionnaires A, B, C and ISCED to SDG 4 indicators is provided in **tables 6 to 9** of the country profile annex. For instance, **table 6** shows that student's information are available in **tables A2, A3, and A5**; the data in A2 feed into the calculation of SDG indicators 4.2.4, 4.c.2, 4.c.4, 4.c.5 and some Other Policy Relevant Indicators (OPRI); data in A3 are necessary for the calculation of SDG indicators 4.2.2 (a global indicator), 4.3.3, and School Life Expectancy.

The average of country X on regularity is 80% because it has not submitted QA and QC in 2023 and 2024 (as seen in **table 10.4** in previous section).

2) Completeness: How complete is the country's submission to the UIS?

This refers to the proportion of the intended data points that are available and reported. It is the percentage of the number of data points (e.g., reported or estimated) out of the total number of data points expected. Higher completeness means that a larger share of the dataset is complete, while lower completeness indicates gaps or missing data.

The information in **table 10.4** above shows that the average of country X on completeness is 86.7%. For QA, it ranges from 82.2% in 2015 and 2016 to 89.4% in 2021. For QC, it ranges from 80.7% in 2021 to 91.2% in 2015.
To understand better the picture, we need to look at **table 10** of the CP annex (or **Table 10.6** below) as it shows all details on completeness by questionnaire table. We can see that in 2022, the country has 100% completeness for **tables A2, A3, A6, A12, C6 and C7**; it has 0% completeness for A11 which means that indicator 4.c.5 cannot be calculated for this country (refer to **table 6** of the CP annex).

Table 10.6.
UIS Survey of Formal Education - Completeness by questionnaire table

Table ofthe UIS Education Questionnaire	2015	2016	2017	2018	2019	2020	2021	2022
A10: Number of classroom teachers by qualified and trained status, teaching level of education, type of institution and sex	20	20	20	20	20	20	20	20
A11: Annual statutory teacher compensation (units of national currency) in public institutions, by teaching level of education- all programmes (general and vocational)	0	0	0	100	100	0	0	0
A12: Number of educational institutions by level of education and type ofinstitution - all programmes (general and vocational)	100	100	100	100	100	100	100	100
A13: Number of educational institutions with ICT services, basic hygiene facilities and the provisioning oflife skills-based HIV and sexuality education by level of education - all programmes (general and vocational)	27	27	27	27	27	27	64	64
A2: Number of students by level of education, intensity of participation, type ofinstitution and sex	100	100	100	100	100	100	100	100
A3: Number of students by level of education, age and sex	85	85	100	100	100	100	100	100
A5: Number of students and repeaters in initial primary education by age, grade and sex	100	100	100	100	99	99	100	96
A6: Number of students and repeaters in initial lower secondary general education by grade, age and sex	100	100	100	100	100	100	100	100
A9: Number of classroom teachers by teaching level of education, type ofinstitution and sex	20	20	20	20	20	20	20	20
B2: Actual expenditure on education by level of education, source and destination in instructional and non-instructional institutions	55	54	54	43	53	11	16	24
B3: Actual expenditure on education by level of education, type ofinstitution and nature in instructional and non-instructional institutions	46	46	46	35	24	24	24	24
C2: Number of students by level of education, type ofinstitution and sex	88	74	88	88	88	88	79	79
C5: Number of students in tertiary education by age and sex	67	67	44	59	44	44	18	18
C6: Number ofinternationally mobile students in tertiary education by country of origin and sex	100	100	100	100	100	100	100	100
C7: Number of graduates by level of education, field and sex	100	100	100	100	100	100	100	100
C8: Number of academic staff by level of education, type of institution and sex	20	0	20	15	20	20	10	15

Source: UNESCO Institute for Statistics (UIS)

3) Quality: Is the data reported to the UIS of good quality?

This refers to the proportion of datapoints reported by countries that pass the UIS quality checks without any changes. It is calculated as 100% minus the proportion of changes introduced by the UIS while processing the data relative to the total data points. High scores mean no or minimal changes, while lower scores suggest more inconsistencies or issues were detected in the data processing which result in changes (including suppression of data points).

The information in **table 10.4** above shows that the average of country X on quality is 91%, ranging from 48.8% for QC in 2015 to 99.1% for QC in 2019 and QA in 2021.

To understand better the picture, we need to look at **table 11** of the CP annex (or **table 10.7** below) as it shows all details on quality by questionnaire table. We can see that country X has some issues with quality in **table C5** - number of students in tertiary education by age and sex. This impacts the calculation of SDG indicators 4.1.4 on out-of-school and 4.3.3 on TVET for instance.

Table 10.7.
UIS Survey of Formal Education - Quality by questionnaire table

Table ofthe UIS Education Questionnaire	2015	2016	2017	2018	2019	2020	2021	2022
A10: Number of classroom teachers by qualified and trained status, teaching level of education, type of institution and sex	100	100	100	100	100	100	100	100
A11: Annual statutory teacher compensation (units of national currency) in public institutions, by teaching level of education- all programmes (general and vocational)	-	-	-	0	0	-	-	-
A12: Number of educational institutions by level of education and type ofinstitution - all programmes (general and vocational)	100	100	100	100	100	100	100	100
A13: Number of educational institutions with ICT services, basic hygiene facilities and the provisioning oflife skills-based HIV and sexuality education by level of education - all programmes (general and vocational)	100	100	100	100	100	100	100	100
A2: Number of students by level of education, intensity of participation, type ofinstitution and sex	100	100	100	100	100	100	100	100
A3: Number of students by level of education, age and sex	100	100	100	100	100	100	100	100
A5: Number of students and repeaters in initial primary education by age, grade and sex	100	100	100	100	100	100	100	100
A6: Number of students and repeaters in initial lower secondary general education by grade, age and sex	100	100	100	100	100	100	100	100
A9: Number of classroom teachers by teaching level of education, type ofinstitution and sex	100	100	100	100	100	100	100	100
B2: Actual expenditure on education by level of education, source and destination in instructional and non-instructional institutions	100	100	100	100	81	100	100	100
B3: Actual expenditure on education by level of education, type ofinstitution and nature in instructional and non-instructional institutions	98	98	98	100	85	100	100	100
C2: Number of students by level of education, type ofinstitution and sex	65	89	100	100	100	92	100	100
C5: Number of students in tertiary education by age and sex	84	80	99	98	98	99	99	88
C6: Number ofinternationally mobile students in tertiary education by country of origin and sex	-	100	100	95	100	96	100	95
C7: Number of graduates by level of education, field and sex	67	77	100	100	100	100	3	100
C8: Number of academic staff by level of education, type of institution and sex	100	-	100	90	100	100	100	100

Source: UNESCO Institute for Statistics (UIS)

Sub-component 3. 'Coverage of indicators in EMIS forms':

This sub-score captures if the variables needed to calculate indicators are collected in the national school census questionnaires or EMIS forms. The sub-score reflects the proportion of indicators that could be calculated as it is the proportion of indicators that are covered in these questionnaires over all possible options. The weight of this sub-component is 0.3.

Country X scored only 26.8% on this sub-component. This sub-score is calculated based on information provided in two tables:

1. The first table (**Tabe 10.8** below) is included in the 'Administrative data' section of the CP and shows coverage of the indicators that could be calculated based on the national school questionnaires of country X: 4.1.3, 4.1.4, 4.1.5, 4.2.2, 4.2.4, 4.3.2, 4.7.2, 4.a.1, and 4.c.1 to 4.c.6.

Table 10.8.
Snapshot of table on coverage of indicators in EMIS forms

Indicator	Category	ISCED	Availability
4.1.3 Gross intake ratio to the last grade (primary education, lower secondary education)	-	1	○
	-	2	○
4.1.4 Out-of-school rate (1 year before primary, primary education, lower secondary education, upper secondary education)	-	02-1	◉
	-	1	◉
	-	2	◉
	-	3	◉

Source: UNESCO Institute for Statistics (UIS)

2. The second table is **Table 12** of the annex (**Table 10.9** below) and provides information on data and metadata collected in country X's national school census questionnaires.

Table 10.9.
Administrative data - Data and metadata collected in national school census questionnaires (selected education items)

Data collected in the national school censuses questionnaire(s)

Country	Argentina

Variables		Early childhood educational development (ISCED 01)	Pre-primary (ISCED 02)	Primary (ISCED 1)	Lower secondary (ISCED 2)	Upper secondary (ISCED 3)	Post-secondary non tertiary (ISCED 4)	Tertiary (ISCED 5 - 8)
Form available		Yes	Yes	Yes	Yes	Yes	Not applicable (level does not exist)	Yes
Students	*by sex (male/female)*	Yes	Yes	Yes	Yes	Yes	Not applicable	Yes
	by age	Yes	Yes	Yes	Yes	Yes	Not applicable	Yes
	by grade			Yes	No			
	by grade and age			No	No			
Graduates	*by field of education*							No
Repeaters	*by sex*			Yes	Yes			
	by grade			No	No			
Teaching staff	*by sex*		No	No	No	No		
	trained teachers (or teachers by professional training)		No	No	No	No		
	qualified teachers (or teachers by academic qualification)		No	No	No	No		
	newly recruited teachers		No	No	No	No		
Educational institutions	*with electricity*			Yes	No	No		
	with internet for pedagogical purposes			Yes	No	No		
	with computers for pedagogical purposes			Yes	No	No		
	with adapted infrastructure and materials for students with disabilities			Yes	No	No		
	with basic drinking water			Yes	No	No		
	with single-sex basic sanitation facilities			Yes	No	No		
	with basic handwashing facilities			Yes	No	No		
	providing life skills-based HIV and sexuality education			No	No	No		

Source: UNESCO Institute for Statistics (UIS)

An analysis of the information in **tables 10.8 and 10.9** helps understand better the low sub-score of country X due to the fact that many indicators cannot be calculated because, to start with, the variables needed for their calculation are not included or collected in the national school census questionnaires. For instance, we see that information on services in educational institutions are not collected for lower and upper secondary in EMIS forms; this means that indicator 4.a.1 cannot be calculated for these levels of education, among which the benchmark indicator on school Internet connectivity.

Annex of the LASER country profile

The last section of the LASER Country Profile is the annex which is composed of 14 tables listed in the table below. Some of these tables are also included in this section.

1. SCED level definitions

Table 1 of the annex provides the name and description of every ISCED level from ISCED 0, i.e. 'Early childhood education', to ISCED 8, i.e. 'Doctoral or equivalent level'.

2. SDG4 indicators list

Table 2 of the annex provides the number and name of all SDG4 indicators by target. It also specifies if an indicator is selected for benchmarking. In addition to SDG 4 indicators, the table also includes the two indicators on education expenditure, namely:
- FFA indicator, or 'Government expenditure on education as a percentage of GDP
- SDG 1.a.2, or 'Proportion of total government spending on essential services (education)

3. SDG4 indicators by data source

Table 3 of the annex provides information on the data source of all SDG4 indicators, SDG 1.1.2 and FFA, namely: system data, school census/administrative/EMIS, multi-purpose survey, labor force survey, literacy survey, learning assessment, special source, and public spending/budget. It also specifies if an indicator is global or thematic and if it is a benchmark indicator.

4. Learning assessments - Mapping of variables needed by SDG4 indicator and type of questionnaire

Table 4 of the annex provides a mapping of the variables needed by SDG4 indicator and type of assessment or questionnaire. It also specifies if the indicator is global or thematic.
School-based questionnaires include those on principal, school, teacher, students, home, ICT coordinator, curriculum, national context survey, and cognitive test.
Household-based questionnaires include household, individual, school, teacher, parent, community, and cognitive test.

5. Administrative data - Mapping of variables needed by SDG4 indicator

Table 5 of the annex shows what variables are needed for the calculation of every SDG 4 indicator. For instance, to calculate the global SDG indicator 4.2.2, we need to have information on the national education system, population data, enrolment by sex, and enrolment by grade. This is also true for SDG indicators 4.1.4 and 4.3.3.

6. Administrative data - UIS Survey of Formal Education: Mapping questionnaire A tables to SDG4 indicators

Table 6 of the annex informs on the type of information derived from every table of questionnaire A (QA) on 'Students and teachers (ISCED 0-4)' of the UIS Survey of Formal Education: e.g. students, teachers, and schools. Informaton on students are collected in **tables A1, A2, A3, A5 and A6**; information on teachers in **tables A9, A10 and A11**; and information on schools in **tables A12 and A13**.
Furthermore, **table 6** shows what indicators may be calculated from the information in each of the questionnaire tables: for instance, the data collected in **table A3** is needed to calcualte SDG indicators 4.2.2 and 4.3.3, in addition to the OPRI indicator School Life Expectancy.

7. Administrative data - UIS Survey of Formal Education: Mapping questionnaire B tables to SDG4 indicators

Table 7 of the annex shows what type of information is collected via questionnaire B (QB) on 'Educational expenditure (ISCED 0-8)' of the UIS Survey of Formal Education. It also informs on the SDG 4 and OPRI indicators that may be calculated based on this information.

8. Administrative data - UIS Survey of Formal Education: Mapping questionnaire C tables to SDG4 indicators
Table 8 of the annex shows what type of information is collected via questionnaire C (QC) on 'Students and teachers (ISCED 5-8)' of the UIS Survey of Formal Education. For instance, the data collected on students in table C5 is necessary for the calculation of SDG indictaor 4.3.2 and three OPRI indicators.

9. Administrative data - UIS Survey of Formal Education: Mapping ISCED questionnaire tables to SDG4 indicators
Table 9 of the annex shows what type of information is collected via the ISCED questionnaire 'National education systems' of the UIS Survey of Formal Education. For instance, the data in T2 allows the calculation of SDG indicatos 4.1.7 and 4.2.5.

10. Administrative data - UIS Survey of Formal Education - Completeness by questionnaire table
Table 10 of the annex is country-specific and refers to the completeness of information by questionnaire table. Completeness is defined as the proportion of the intended data points that are available and reported. It is calculated as the number of data points (e.g., reported or estimated) divided by the total number of data points expected, expressed as a percentage. Higher completeness means that a larger share of the dataset is complete, while lower coverage indicates gaps or missing data.

11. Administrative data - UIS Survey of Formal Education - Quality by questionnaire table
Table 11 of the annex is country-specific and refers to the quality of information by questionnaire table. Quality is measured as the proportion of data points reported by countries that pass the UIS quality checks without any changes. It is calculated as 100% minus the proportion of changes introduced by the UIS while processing the data relative to the total data points. High-quality data should have minimal discrepancies, while lower quality suggests more inconsistencies or issues in the data processing.

12. Administrative data - Data and metadata collected in national school census questionnaires (selected education items)
Table 12 of the annex is country-specific and shows the metadata and data collected in the national school census questionnaire.

13. Administrative data - Inequality dimensions captured in national school census questionnaires (selected education items)
Table 13 of the annex is country-specific and reveals information on inequality dimensions captured in national school-census questionnaires: data by sex, location, disability status, first or home language, immigration status, and indigenous status.

14. Household Survey Data - Mapping of variables needed by SDG4 indicator
Table 14 of the annex shows the mapping of variables in household surveys needed for the calculation of SDG 4 indicators. For instance, information on attendance by age is necessary for the calculation of SDG indicators 4.1.4, 4.1.5, 4.2.2, 4.2.4, 4.3.2, and 4.3.3.

Annex

A.1 ISCED level definitions

ISCED level	Name	Description
ISCED 0	Early Childhood education	Holistic approach to support children's early cognitive, physical, social, and emotional development with an intentional education component. - ISCED 01: Early childhood educational development (entry age 0-2 years) - ISCED 02: Pre-primary education (entry age 3 to start of Primary)
ISCED 1	Primary Education	Provide fundamental skills in reading, writing and mathematics and a solid foundation of understanding other subjects. Basic level of complexity with little, if any, specialization. Entry age: between 5 and 7 years; Typical duration: 6 years.
ISCED 2	Lower secondary Education	Subject-oriented curriculum building on primary learning and laying foundation for lifelong learning and human development. Teachers typically with pedagogical training in specific subjects. General programmes typically; vocational programmes in some countries.
ISCED 3	Upper secondary Education	Provide more varied, specialized and in-depth instruction, with increased range of options and streams. Teachers often highly qualified in subjects/fields of specialization. Both general and vocational programmes. Entry age: between 14 and 16 years; Typical duration: 3 years.
ISCED 4	Post-secondary non-tertiary education	Broaden rather than deepen knowledge, skills and competencies gained in upper secondary; prepare for entry into labour market and/or tertiary education.Vocational programmes typically; general programmes in some countries.
ISCED 5	Short-cycle tertiary Education	Provide professional knowledge, skills and competencies. Practically based and occupation specific. Prepare to entry into labour market or other tertiary education programmes. Both general and vocational programmes. Minimum duration: 2 years.
ISCED 6	Bachelor's or equivalent level	Provide intermediate academic and/or professional knowledge, skills and competencies, leading to a first degree or equivalent qualification. Theoretically based typically; may include practical components. - ISCED 665: First degree (3-4 years) - ISCED 666: Long first degree (>4 years) - ISCED 667: Second or further degree, following successful completion of a Bachelor's or equivalent programme
ISCED 7	Master's or equivalent level	Provide advanced academic and/or professional knowledge, skills and competencies, leading to a second degree or equivalent qualification Theoretically based typically; may include practical components; may have a substantial research component.
ISCED 8	Doctoral or equivalent level	Designed primarily to lead to an advanced research qualification. Devoted to advanced study and original research. Both academic and professional fields.

Source: UNESCO Institute for Statistics (UIS)

A.2 List of SDG4 indicators

Target 4.1	By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes
4.1.0	Proportion of children/young people prepared for the future, by sex
4.1.1(*)	Proportion of children and young people (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex
4.1.2(*)	Completion rate (primary education, lower secondary education, upper secondary education)
4.1.3	Gross intake ratio to the last grade (primary education, lower secondary education)
4.1.4(*)	Out-of-school rate (1 year before primary, primary education, lower secondary education, upper secondary education)
4.1.5	Percentage of children over-age for grade (primary education, lower secondary education)
4.1.6	Administration of a nationally representative learning assessment (a) in Grade 2 or 3; (b) at the end of primary education; and (c) at the end of lower secondary education
4.1.7	Number of years of (a) free and (b) compulsory primary and secondary education guaranteed in legal frameworks
Target 4.2	By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education
4.2.1	Proportion of children aged 24-59 months who are developmentally on track in health, learning and psychosocial well-being, by sex
4.2.2(*)	Participation rate in organized learning (one year before the official primary entry age), by sex
4.2.3	Percentage of children under 5 years experiencing positive and stimulating home learning environments
4.2.4	Net early childhood education enrolment rate in (a) pre-primary education and (b) early childhood educational development
4.2.5	Number of years of (a) free and (b) compulsory pre-primary education guaranteed in legal frameworks
Target 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
4.3.2	Gross enrolment ratio for tertiary education by sex
4.3.3	Participation rate in technical-vocational programmes (15- to 24-year-olds) by sex
Target 4.4	By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship
4.4.1	Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill
4.4.2	Percentage of youth/adults who have achieved at least a minimum level of proficiency in digital literacy skills
4.4.3	Youth/adult educational attainment rates by age group and level of education

Target 4.5	By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations
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
4.5.2	Percentage of students in a) early grades, b) at the end of primary, and c) at the end of lower secondary education who have their first or home language as language of instruction
4.5.3	Existence of funding mechanisms to reallocate education resources to disadvantage populations
4.5.4	Expenditure on education per student by level of education and source of funding
4.5.5	Percentage of total aid to education allocated to least developed countries
4.5.6	Expenditure on education by source of funding (public, private, international) as a percentage of GDP
Target 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	Proportion of population in a given age group achieving at least a fixed level of proficiency in functional (a) literacy and (b) numeracy skills, by sex
4.6.2	Youth/adult literacy rate
Target 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 nonviolence, 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 are mainstreamed in (a) national education policies, (b) curricula, (c) teacher education and (d) student assessment
4.7.2	Percentage of schools that provide life skills-based HIV and sexuality education
4.7.3	Extent to which green policy intentions are mainstreamed in curriculum documents
4.7.4	Percentage of students in lower secondary education showing adequate understanding of issues relating to global citizenship and sustainability
4.7.5	Percentage of students in lower secondary showing proficiency in knowledge of environmental science and geoscience
Target 4.a	Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all
4.a.1(***)	Proportion of schools offering basic services, by type of service
4.a.2	Percentage of students experiencing bullying in the last 12 months in a) primary, and b) lower secondary education
4.a.3	Number of attacks on students, personnel, and institutions
4.a.4	Proportion of school attending children receiving school meals

Target 4.b	By 2020, substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education, including vocational training 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
Target 4.c	By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing States
4.c.1(*)	Proportion of teachers with the minimum required qualifications, by education level
4.c.2	Pupil-trained teacher ratio by education level
4.c.3	Percentage of teachers qualified according to national standards by education level and type of institution
4.c.4	Pupil-qualified teacher ratio by education level
4.c.5	Average teacher salary relative to other professions requiring a comparable level of qualification
4.c.6	Teacher attrition rate by education level
4.c.7	Percentage of teachers who received in-service training in the last 12 months by type of training
FFA	Education 2030 Framework for Action
(*)	Government expenditure on education as a percentage of GDP
Target 1.a	By 2030, ensure significant mobilization 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
1.a.2(*)	Proportion of total government spending on essential services (education)

Note:
(*) Benchmark indicator
(**) Benchmark indicator is 'Gender gap in upper secondary completion rate'
(***) Benchmark indicator is 'Proportion of schools with access to Internet for pedagogical purposes'

Metadata for SDG 4 indicators are available at: http://tcg.uis.unesco.org/methodological-toolkit/metadata/

Source: UNESCO Institute for Statistics (UIS)

A.3 SDG4 indicators by data source

Indicator	Indicator Name	Global (G) Thematic (T) Benchmark (B)	Sources of data								
			System data	School census / Administrat data / EMIS	Multi-purpo survey	Labour force survey	Literacy survey	School survey	Learning assessment	Special source	Public spending / budget
FFA Government expenditure on education as a percentage of GDP	FFA Government expenditure on education as a percentage of GDP	T/B	-	-	-	-	-	-	-	Yes	Yes
1.a.2 Proportion of total government spending on essential services (education, health and social protection)	1.a.2 Proportion of total government spending on essential services (education)	G/B	-	-	-	-	-	-	-	-	Yes
4.1.0 Proportion of children/young people prepared for the future, by sex	4.1.0 Proportion of children/young people prepared for the future	T	-	-	Yes	Yes	-	-	Yes	-	-
4.1.1 Proportion of children and young people (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex	4.1.1 Learning Reading/Math	G/B	-	-	Yes	-	-	-	Yes	-	-
4.1.2 Completion rate (primary education, lower secondary education, upper secondary education)	4.1.2 Completion rate	G/B	-	-	Yes	Yes	-	-	-	-	-
4.1.3 Gross intake ratio to the last grade (primary education, lower secondary education)	4.1.3 Gross intake ratio to the last grade	T	-	Yes	-	-	-	-	-	-	-
4.1.4 Out-of-school rate (1 year before primary, primary education, lower secondary education, upper secondary education)	4.1.4 Out-of-school rate	T	-	Yes	Yes	-	-	-	-	-	-
4.1.5 Percentage of children over-age for grade (primary education, lower secondary education)	4.1.5 Percentage of children over-age for grade	T	-	Yes	Yes	-	-	-	-	-	-
4.1.6 Administration of a nationally-representative learning assessment (a) in Grade 2 or 3; (b) at the end of primary education; and (c) at the end oflower secondary education	4.1.6 Administration of a nationally-representative learning assessment	T	-	-	-	-	-	-	Yes	-	-
4.1.7 Number of years of (a) free and (b) compulsory primary and secondary education guaranteed in legal frameworks	4.1.7 Number of years offree and compulsory education in primary and secondary	T	Yes	-	-	-	-	-	-	-	-
4.2.1 Proportion of children aged 24-59 months who are developmentally on track in health, learning and psychosocial well-being, by sex.	4.2.1 Children aged 24-59 months who are developmentally on track	G	-	-	Yes	-	-	-	-	-	-
4.2.2 Participation rate in organized learning (one year before the official primary entry age), by sex	4.2.2 Participation in organized learning one year before primary	G/B	-	Yes	Yes	-	-	-	-	-	-
4.2.3 Percentage of children under 5 years experiencing positive and stimulating home learning environments	4.2.3 Home learning environments	T	-	-	Yes	-	-	-	-	-	-
4.2.4 Net early childhood education enrolment rate in (a) pre-primary education and (b) early childhood educational development	4.2.4 Net early childhood education enrolment rate	T	-	Yes	Yes	-	-	-	-	-	-
4.2.5 Number of years of (a) free and (b) compulsory pre-primary education guaranteed in legal frameworks	4.2.5 Number of years offree and compulsory pre-primary	T	Yes	-	-	-	-	-	-	-	-
4.3.1 Participation rate of youth and adults in formal and non-formal education and training in the previous 12 months, by sex	4.3.1 Youth and adults in formal and non-formal education and training	G	-	-	Yes	Yes	-	-	-	-	-
4.3.2 Gross enrolment ratio for tertiary education, by sex	4.3.2 Gross enrolment ratio for tertiary education	T	-	Yes	Yes	Yes	-	-	-	-	-
4.3.3 Participation rate in technical and vocational programmes (15- to 24-year-olds), by sex	4.3.3 Participation rate in technical and vocational programmes	T	-	Yes	Yes	Yes	-	-	-	-	-
4.4.1 Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill	4.4.1 Information and communications technology (ICT) skills	G	-	-	Yes	-	-	-	-	Yes	-
4.4.2 Percentage of youth/adults who have achieved at least a minimum level of proficiency in digital literacy skills	4.4.2 Digital literacy skills	T	-	-	-	-	-	-	Yes	-	-
4.4.3 Youth/adult educational attainment rates by age group and level of education	4.4.3 Attainment rates	T	-	-	Yes	Yes	-	-	-	-	-
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	4.5.1 Parity indices	G	-	Yes	Yes	Yes	Yes	-	Yes	Yes	-
4.5.2 Percentage of students in a) early grades, b) at the end of primary, and c) at the end of lower secondary education who have their first or home language as language of instruction	4.5.2 Students who have their first or home language as language ofinstruction	T	-	Yes	Yes	-	-	-	-	-	-
4.5.3 Existence offunding mechanisms to reallocate education resources to disadvantaged populations	4.5.3 Reallocation of educational resources	T	-	-	-	-	-	-	-	-	Yes
4.5.4 Expenditure on education per student by level of education and source offunding	4.5.4 Expenditure on education per student	T	-	-	Yes	-	-	-	-	Yes	Yes
4.5.5 Percentage of total aid to education allocated to least developed countries	4.5.5 Aid to education allocated to least developed countries	T	-	-	-	-	-	-	-	Yes	-
4.5.6 Expenditure on education by source offunding (public, private, international) as a percentage of GDP	4.5.6 Expenditure on education by source of funding	T	-	-	Yes	-	-	-	-	-	Yes
4.6.1 Proportion of population in a given age group achieving at least a fixed level of proficiency in functional (a) literacy and (b) numeracy skills, by sex	4.6.1 Functional literacy and numeracy skills	G	-	-	Yes	Yes	-	-	Yes	-	-
4.6.2 Youth/adult literacy rate	4.6.2 Literacy	T	-	-	Yes	Yes	Yes	-	-	-	-
4.7.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment	4.7.1 Mainstreamed of GCE and ESD	G	Yes	-	-	-	-	-	Yes	Yes	-
4.7.2 Percentage of schools that provide life skills-based HIV and sexuality education	4.7.2 Schools that provide life skills-based HIV and sexuality education	T	-	Yes	-	-	-	Yes	-	-	-
4.7.4 Percentage of students in lower secondary showing adequate understanding of issues relating to global citizenship and sustainability	4.7.4 Global citizenship and sustainability	T	-	-	-	-	-	-	Yes	-	-
4.7.5 Percentage of students in lower secondary showing proficiency in knowledge of environmental science and geoscience	4.7.5 Environmental science and geoscience	T	-	-	-	-	-	-	Yes	-	-
4.a.1 Proportion of schools offering basic services, by type of service	4.a.1 Proportion of schools offering basic services	G/B	-	-	-	-	-	Yes	-	-	-
4.a.2 Percentage of students experiencing bullying in the last 12 months in a) primary and b) lower secondary education	4.a.2 Bullying	T	-	-	Yes	-	-	-	Yes	Yes	-
4.a.3 Number of attacks on students, personnel and institutions	4.a.3 Attacks on students, personnel and institutions	T	-	-	Yes	-	-	-	Yes	Yes	-
4.b.1 Volume of official development assistance flows for scholarships by sector and type of study	4.b.1 Assistance for scholarships	G	-	Yes	-	-	-	-	-	-	-
4.c.1 Proportion of teachers with the minimum required qualifications, by education level.	4.c.1 Teachers with minimum qualifications	G/B	-	Yes	-	-	-	-	-	-	-
4.c.2 Pupil-trained teacher ratio by education level	4.c.2 Pupil-trained teacher	T	-	Yes	-	-	-	-	-	-	-
4.c.3 Percentage of teachers qualified according to national standards by education level and type ofinstitution	4.c.3 Qualified teachers	T	-	Yes	-	-	-	-	-	-	-
4.c.4 Pupil-qualified teacher ratio by education level	4.c.4 Pupil-qualified teacher	T	-	Yes	-	-	-	-	-	-	-
4.c.5 Average teacher salary relative to other professions requiring a comparable level of qualification	4.c.5 Average teacher salary	T	-	Yes	-	Yes	-	-	-	-	-
4.c.6 Teacher attrition rate by education level	4.c.6 Teacher attrition rate	T	-	Yes	-	-	-	-	-	-	-
4.c.7 Percentage of teachers who received in-service training in the last 12 months by type of training	4.c.7 Teachers who received in-service training	T	-	Yes	-	-	-	-	-	-	-

Source: UNESCO Institute for Statistics (UIS)

A.4 Laser weights

Description	Weight	
Key components Sub-components	Key components	Sub- components
Learning assessments	**0.25**	
Regularity of administration		0.20
Coverage of major education issues (SDG 4 Indicators)		0.30
Coverage of major dimensions of inequality		0.20
Alignment with Internationally Accepted Standards		0.30
Total		**1.00**
Administrative data	**0.25**	
ISCED mapping 2011 is available		0.20
Response to UIS Education Survey in the period		0.50
Coverage of indicators in EMIS forms		0.30
Total		**1.00**
Survey population system	**0.25**	
Household surveys		0.50
Labour force surveys		0.25
Population census		0.25
Total		**1.00**
Expenditure on education	**0.10**	
Response to UIS Education Survey in the period		0.60
Government expenditure on education data is publicly available		0.15
Availability of private expenditure in the period		0.25
Total		**1.00**
Review and monitoring	**0.15**	
Benchmarks for education indicators published by the UIS		0.70
National education plans are publicly available and have quantitative target		0.15
National indicators reports are published by ISCED level		0.15
Total		**1.00**
Total	**1.00**	

Source: UNESCO Institute for Statistics (UIS)

A.5 Laser Cut-off points

	Nascent	Limited	Moderate	Well-developed	Sustainable
LASER	0-20%	20-40%	40-60%	60-80%	80-100%
Learning assessments	0-60%	60-70%	70-80%	80-90%	90-100%
Administrative data	0-30%	30-50%	50-70%	70-90%	90-100%
Survey population system	0-30%	30-50%	50-70%	70-90%	90-100%
Expenditure on education	0-30%	30-50%	50-60%	60-70%	70-100%
Review and monitoring	0-20%	20-40%	40-60%	60-80%	80-100%

Source: UNESCO Institute for Statistics (UIS)

A.6 Distribution of countries by component and maturity level

Labels	Maturity level	Count	Percentage
Learning assessments	Nascent	57	27.8
	Limited	15	7.3
	Moderate	16	7.8
	Well-developed	52	25.4
	Sustainable	65	31.7
	Total	**205**	**100**
Administrative data	Nascent	3	1.5
	Limited	11	5.4
	Moderate	55	26.8
	Well-developed	127	62
	Sustainable	9	4.3
	Total	**205**	**100**

Source: UNESCO Institute for Statistics (UIS)

Survey population systems	Nascent	6	2.9
	Limited	62	30.2
	Moderate	39	19
	Well-developed	42	20.5
	Sustainable	56	27.4
	Total	**205**	**100**
Expenditure on education	Nascent	49	23.9
	Limited	28	13.6
	Moderate	50	24.4
	Well-developed	42	20.5
	Sustainable	36	17.6
	Total	**205**	**100**
Review and monitoring	Nascent	23	11.2
	Limited	31	15.1
	Moderate	43	21
	Well-developed	82	40
	Sustainable	26	12.7
	Total	**205**	**100**
LASER	Nascent	1	0.5
	Limited	22	10.7
	Moderate	47	22.9
	Well-developed	101	49.3
	Sustainable	34	16.6
	Total	**205**	**100**

Source: UNESCO Institute for Statistics (UIS)

Resources

1. The Education Data Ecosystem

UNESCO Institute for Statistics. 2023. Data for education: A guide for policymakers to leverage education data.
https://tcg.uis.unesco.org/wp-content/uploads/sites/4/2024/01/Data-for-Education-PDF-1.pdf

2. The SDG 4 indicator framework

UNESCO Institute for Statistics. 2016. Laying the foundation to measure Sustainable Development Goal 4: Sustainable Development Data Digest.
https://tcg.uis.unesco.org/wp-content/uploads/sites/4/2018/08/laying-the-foundation-to-measure-sdg4-sustainable-development-data-digest-2016-en.pdf

UNESCO. 2015. Education 2030: Incheon Declaration and Framework for Action for the Implementation of Sustainable Development Goal 4.
https://uis.unesco.org/sites/default/files/documents/education-2030-incheon-framework-for-action-implementation-of-sdg4-2016-en_2.pdf

United Nations. 2014. The Road to Dignity by 2030: Ending Poverty, Transforming All Lives and Protecting the Planet, Synthesis Report of the Secretary-General on the Post-2015 Agenda.
https://www.un.org/disabilities/documents/reports/SG_Synthesis_Report_Road_to_Dignity_by_2030.pdf

Education Data and Statistics Commission.
https://tcg.uis.unesco.org/

Inter-agency and Expert Group on SDG Indicators (IAEG-SDGs)
https://unstats.un.org/sdgs/iaeg-sdgs

Dharamshi et al. 2022. A Bayesian Model for Estimating Sustainable Development Goal Indicator 4.1.2: School Completion Rates.
https://academic.oup.com/jrsssc/article/71/5/1822/7073267

UNESCO Institute for Statistics. 2021. Metadata of SDG indicator 4.1.4.
https://tcg.uis.unesco.org/wp-content/uploads/sites/4/2021/09/Metadata-4.1.4.pdf

UNESCO Institute for Statistics and UNICEF. 2005. Children out of school: Measuring exclusion from primary education.
https://uis.unesco.org/sites/default/files/documents/children-out-of-school-measuring-exclusion-from-primary-education-en_0.pdf

UNESCO Institute for Statistics and Global Education Monitoring Report. 2022. A Bayesian Cohort Model for Estimating SDG Indicator 4.1.4: Out-of-School Rates.
https://www.unesco.org/gem-report/sites/default/files/medias/fichiers/2022/08/OOS_Proposal.pdf

Education Data and Statistics Commission. Benchmarks Page.
https://tcg.uis.unesco.org/benchmarks-new/

UNESCO Institute for Statistics and Global Education Monitoring Report. 2024. SDG 4 scorecard progress report on national benchmarks: focus on teachers.
https://unesdoc.unesco.org/ark:/48223/pf0000388411

3. UIS support to member states

UNESCO Institute for Statistics. UIS Data Browser.
https://databrowser.uis.unesco.org/

UNESCO Institute for Statistics. UIS Data API.
https://api.uis.unesco.org/api/public/documentation/

UNESCO Institute for Statistics. Bulk Data Download Service.
https://uis.unesco.org/bdds

UNESCO Institute for Statistics. UIS SDG Data Explorer.
https://sdg4-data.uis.unesco.org/

4. LASER unlocks the potential of education data

UNESCO Institute for Statistics. LASER Page.
https://tcg.uis.unesco.org/laser/

UNESCO Institute for Statistics. LASER Concept Note.
https://tcg.uis.unesco.org/wp-content/uploads/sites/4/2024/02/LASER-Concept-Note_240201-02.pdf

United Nations. 2014. Fundamental principles of national official statistics.
https://unstats.un.org/unsd/dnss/gp/fundprinciples.aspx

5. Learning assessments

UNESCO Institute for Statistics. 2023. Reporting learning outcomes in basic education: Country's options for indicator 4.1.1.
https://tcg.uis.unesco.org/wp-content/uploads/sites/4/2022/08/Countrys-reporting-option-_Zambia_AAEA.Final_.pdf

UNESCO Institute for Statistics. 2022. Monitoring of the Sustainable Development Goals Using Large-Scale International Assessments.
https://tcg.uis.unesco.org/wp-content/uploads/sites/4/2022/04/Monitoring-of-the-SDGs-Using-Large-Scale-International-Assessments_April-2022.pdf

UNESCO Institute for Statistics. 2024. GAML/EDSC criteria for use of an assessment to report on SDG 4.1.1.
https://tcg.uis.unesco.org/wp-content/uploads/sites/4/2024/02/GAML-Criteria-for-reporting.pdf

UNESCO Institute for Statistics. 2024. Learning assessments and skills survey data: challenges and solutions forward.
https://ces.uis.unesco.org/wp-content/uploads/sites/23/2024/01/EDS-7-Learning-assessments-and-skills-data-Final-WEB.pdf

6. Administrative data

UNESCO Institute for Statistics. 2020. Operational Guide to Using EMIS to Monitor SDG 4.
https://emis.uis.unesco.org/wp-content/uploads/sites/5/2020/09/EMIS-Operational-Guide-EN-WEB.pdf

UNESCO Institute for Statistics. 2024. Administrative data: Challenges and solutions forward.
https://ces.uis.unesco.org/wp-content/uploads/sites/23/2024/01/EDS-4-Administrative-Final-WEB.pdf

7. Surveys

UNESCO Institute for Statistics. 2024. Household survey data: challenges and solutions forward.
https://ces.uis.unesco.org/wp-content/uploads/sites/23/2024/01/EDS-8-Household-survey-data-Final-WEB.pdf

8. Expenditure on education

UNESCO Institute for Statistics. 2024. Education expenditure data: challenges and solutions forward.
https://ces.uis.unesco.org/wp-content/uploads/sites/23/2024/01/EDS-6-Expenditure-Final-WEB.pdf

9. Review and monitoring

UNESCO Institute for Statistics. 2024. National SDG 4 benchmarks : challenges and solutions forward.
https://ces.uis.unesco.org/wp-content/uploads/sites/23/2024/01/EDS-9-National-SDG4-Benchmarks-Final-WEB.pdf

National Education Statistical Capacity Assessment: Global Analysis Based on a Maturity Model

The LASER tool, developed by the UNESCO Institute for Statistics (UIS), empowers countries to assess the maturity of their education data systems across five key components: Learning Assessments, Administrative Data, Survey Population System, Expenditure on Education, and Review and Monitoring.

By identifying strengths and weaknesses in data coverage, quality, and alignment with international standards, LASER enables countries to prioritize areas for improvement and craft targeted actions plans. This strengthens evidence-based policymaking, and alignment with both national priorities and global commitments like SDG 4.

The LASER acrostic represents five essential pillars of a strong education data ecosystem:

1. Learning assessments meet international standards.
2. Administrative data is regularly collected on key indicators and inequality dimensions.
3. Survey population systems ensure consistent reporting on education and inequality.
4. Expenditure data captures both public and private investments.
5. Review and Monitoring fosters accountability through indicator reports, national plans, and benchmarking.

The report – National Education Statistical Capacity Assessment: Global Analysis Based on a Maturity Model – offers the first worldwide evaluation of education data systems across 205 countries. Using a maturity model, it charts progress across staged levels, encouraging countries to achieve greater maturity over time. Accompanied by a platform generating detailed country profiles, LASER provides a comprehensive tool to transform education data ecosystems globally.

With LASER, countries can transform education data into powerful tools for progress.

LASER

for Education Information Ecosystem

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