

USING HOUSEHOLD SURVEYS TO MONITOR SDG 4

DRAFT

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1. Introduction

Household surveys (HHS) and census are a key data source of data on educational outcomes at the national and subnational levels, and among different socioeconomic groups. They are central for monitoring various SDG 4 indicators regarding educational attainment, attendance and learning outcomes, such as completion rates, out of school rates and literacy. Moreover, they offer inherent advantages over administrative data systems regarding the collection of disaggregated data.

This paper aims to promote discussion and build consensus on how household surveys can most effectively be used to collect relevant education data. It will first overview the rationale for using HHS and census to monitor education indicators (and specifically SDG 4), what information can typically be collected, and where they may supplement administrative data systems. Secondly, it will highlight some of the main obstacles preventing effective survey monitoring, such as national institutional capacities, data availability and accessibility, and limitations in survey instruments in respect to comparability, coverage and accuracy. Lastly, it will outline provisional recommendations on which stakeholders can collaborate to improve survey-based monitoring.

2. Application of household surveys for education monitoring

Reliable data is crucial in tracking advancements towards the Sustainable Development Goals (SDGs) and in steering policy to guarantee the effective allocation of resources. As a result of the concerted efforts of governments and various stakeholders, we have an increasingly clear understanding of extent of educational participation and achievement. However, with less than 6 years till 2030, data gaps across countries and time remain prevalent for many SDG 4 indicators. Household surveys have a key role in filling these gaps, and in enabling policymakers and administrators to target disadvantaged groups.

What indicators can be calculated from HHS and census?

SDG 4 is comprised of 10 targets with 44 indicators covering issues from participation general and vocational education, school level completion, and achievement of learning outcomes within school and beyond. Several primary data sources inform calculation of SDG 4 indicators, including administrative data collected from Education Management Information Systems (EMIS) from sources such as school census, and school-based sample surveys. Population census, and to a greater extent household sample surveys, are additional key components of any monitoring system.

Both household surveys and census typically collect data on the highest education level attained by respondents, and can therefore be used to calculate indicators such as completion rates (4.1.2) and educational attainment rates (4.4.3). Data on school attendance is also commonly collected, informing indicators such as out of-school rates and attendance ratios (4.2.2, 4.1.4 and 4.3.2). The full range of SDG indicators that can be calculated from household surveys and census is however clearly dependent on the question sets that can be accommodated. In this respect, household sample surveys have greater flexibility on the scope of topics compared to population censuses, for which question sets are more constrained due to practical considerations of cost and ensuring universal response.

Table 1: SDG indicators that may be derived using household survey data

Indicator	Indicator description	Type
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	Thematic
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	Global
4.1.2	Completion rate (primary education, lower secondary education, upper secondary education)	Global
4.1.4	Out-of-school rate (primary education, lower secondary education, upper secondary education) ⁱ	Thematic
4.1.5	Percentage of children over-age for grade (primary education, lower secondary education)	Thematic
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	Global
4.2.2	Participation rate in organized learning (one year before the official primary entry age), by sex	Global
4.2.3	Percentage of children under 5 years experiencing positive and stimulating home learning environments	Thematic
4.2.4	Gross early childhood education enrolment ratio in (a) pre-primary education and (b) early childhood educational development	Thematic
Target 4.3: By 2030, ensure equal access for all women and men to affordable 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	Global
4.3.2	Gross enrolment ratio for tertiary education by sex	Thematic
4.3.3	Participation rate in technical-vocational programmes (15- to 24-year-olds) by sex	Thematic
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	Global
4.4.3	Youth/adult educational attainment rates by age group and level of education	Thematic
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	Global
4.5.2	Percentage of students in primary education who have their first or home language as language of instruction	Thematic
4.5.4	Education expenditure per student by level of education and source of funding	Thematic
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	Global
4.6.2	Youth/adult literacy rate	Thematic
Target 4.7: By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development		
4.a.2	Percentage of students in lower secondary education showing adequate understanding of issues relating to global citizenship and sustainability	Thematic
4.a.4	Percentage of students in lower secondary education showing proficiency in knowledge of environmental science and geoscience.	Thematic
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.2	Percentage of students experiencing bullying in the last 12 months	Thematic
4.a.4	Proportion of school attending children receiving school meals	Thematic

Given sufficient scope, household sample surveys may feasibly collect a much wider range of relevant data beyond basic educational attainment and attendance. This includes information such as learning outcomes, literacy, household education expenditure, and the home and school social environment. Indeed, household surveys can potentially inform reporting for over half of the SDG 4 indicators, as summarised in **Table 1**.

Socioeconomic disaggregation of education indicators

A key characteristic of surveys and census is the ability to provide highly disaggregated data on various socio-economic characteristics. Such data is highly useful for policy makers and planners to inform targeting of disadvantaged groups and geographic regions. It is also necessary to inform reporting on SDG 4.5.1: parity indices for all SDG 4 indicators that can be disaggregated.

Household survey and census typically query a range of relevant background information, with the significant majority collect data on respondent's sex, age and geographic location (including rural/urban distinction). Additional background factors for which surveys may collect information and on which education indicators should, where possible, be disaggregated include:

- Household wealth or income
- Disability status
- Migration status
- Ethnic background

Measurements of the above however present challenges for data collection in respect to non-response, the length and complexity of the survey instrument. Definitions and measures also frequently vary between countries complicating comparability in international reporting. These issues are discussed in more detail in section two.

Advantages of household surveys over administrative data

Administrative data, such as that collected through education ministries, school census and government finance systems, is typically updated regularly, universal in nature, and essential for education planning purposes. It is also needed for reporting on the SDG 4 agenda, while certain indicators concerning the education system and regulatory environment are necessarily derived from administrative sources. Household surveys and census offer and supplementary source to administrative data for many SDG 4 indicators and are the primary source for others. They also offer some distinct advantages in several respects.

Disaggregation and equity: Due to the scope of contextual information collected from household surveys, surveys are more suitable for producing disaggregated indicators on factors such as household wealth disability, migration status and ethnicity. As such, household surveys serve as a key data source for reporting on SDG 4.5.1.

Coverage: nationally representative household surveys can potentially provide comparably greater coverage of target populations vis-a-vis administrative data. For example, school census, and administrative systems generally do not collect relevant data on children not enrolled in school, or those who have never attended. In some contexts, administrative systems may also not collect data on children attending private sector and non-government schools.

Administrative data systems of the education ministry are also predominately focussed on the school aged population and those attending formal educational institutions. Household surveys are a comparatively important source of information on the educational attainment, attendance and learning outcomes in the adult population, and for those attending non-formal education. Additionally, in decentralized states, administrative data collected by subnational education authorities may not always be comparable. In these contexts, sample surveys and census can provide reliable estimates at the national level, as well as inform subnational comparative analysis.

Data quality: In addition to issues of data coverage, household surveys may provide more accurate estimates of education indicators at the sub-national level where administrative data systems face challenges in maintaining valid records, for example due to missing, partial or erroneous responses to school surveys. Certain types of sensitive or confidential information, such as on ethnicity, household wealth or income, and migration or disability may be more accurately reported in anonymized surveys compared to administrative data collection.

Flexibility: Administrative systems aim for complete coverage of target populations (e.g., all students, or all public school teachers). They also rely on an extensive data collection infrastructure, involving administrators, schools, and interlinked systems for information management and storage. This can constrain capacities to change course and collect data for new education indicators, and or revise existing data. On the other hand, sample surveys being sample based can be cheaper to administer and can more quickly respond to emerging priorities - as evidenced during the COVID-19 pandemic where sample surveys provided valuable information on educational challenges experienced by children and families during periods of school closure.

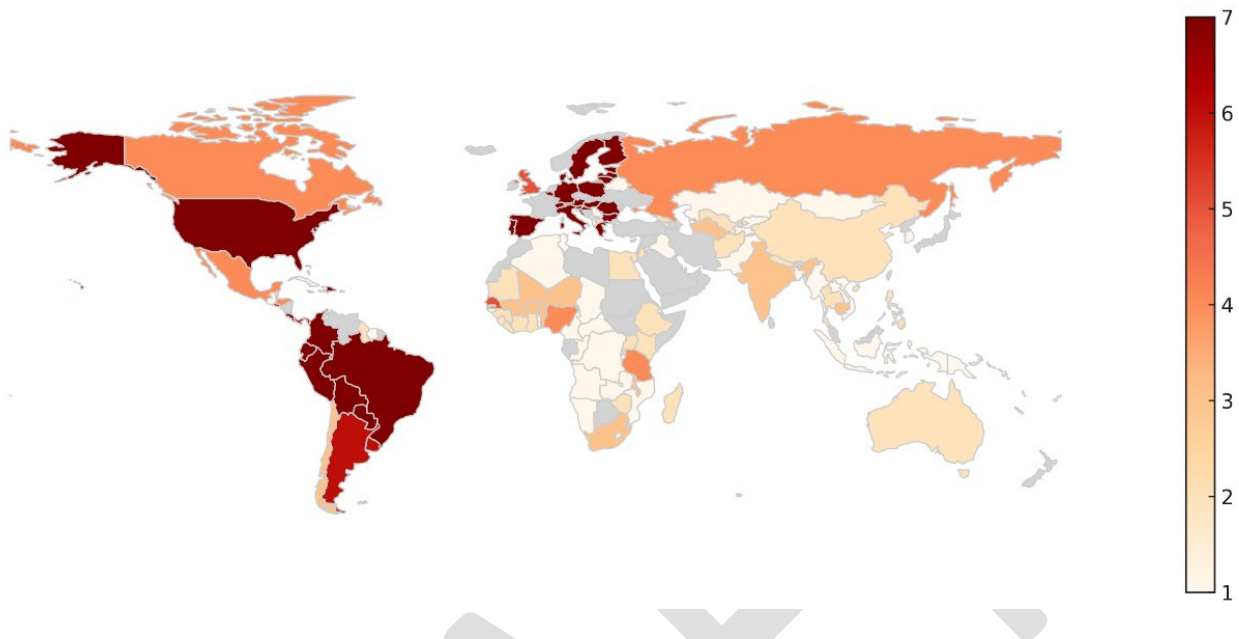
Survey coverage in the UIS database

Despite their potential benefits for education monitoring, household surveys remain underutilized, reflecting limitations in survey availability, survey accessibility, and exploitation of available data. This contributes to data gaps in reporting on SDG 4 across countries, and over time within countries, particularly for indicators that are necessarily reliant on household survey data.

The UIS relies significantly on data submissions by national authorities. These submissions are largely derived from administrative data, but include survey and census estimates calculated by national authorities. Indicators calculated from survey and census by the UIS and partners, such as the Global Education Monitoring Report, and the United Nations Commission for Latin America and the Caribbean (ECLAC) are also key. Data coverage patterns in respect to the latter provide an indication of the availability of surveys and census suitable for the calculation of SDG 4 indicators.

Figure 1 illustrates the number of years per country where a household surveys and census has been processed by the UIS and partners. A sizeable share of countries in North America and Europe and in the Latin America have surveys covering seven years between 2015 and 2022. Coverage is significantly lower in Asia and Africa, with many countries covered by less than two surveys over this time period.

Figure 1: Survey and census coverage in the UIS database¹.
Number of years covered by a relevant survey per country, 2015-2022



3. Obstacles that prevent the effective use of household surveys

Technical and financial constraints to survey implementation

Although household surveys offer a cost-effective means to estimate a wide range of education indicators, implementing a nationally representative household survey poses a multitude of financial and technical requirements which can prove challenging to fulfil.

To ensure representation at the national and subnational level, surveys require a good quality sampling frame that comprehensively captures the demographic composition of the population. A representative account of households, and ideally all individuals, is also required to inform post-stratification weighting procedures to correct for imbalances or discrepancies between the sample and the target population.

Technical expertise is necessary to design appropriate instruments, select the sampling methodology, and determine the appropriate data collection techniques. This includes deciding on the survey's scope, sample size, and questionnaire design. Comprehensive training for survey enumerators and data collection teams is also imperative, as is the implementation of quality control measures throughout the various stages of the survey, encompassing data collection, data entry, and data analysis. This includes mechanisms for monitoring the performance of enumerators, conducting spot-checks, and ensuring data accuracy, consistency and completeness (UIS, 2020).

Measures should be in place to protect the privacy of collected data, including secure storage, and compliance with data protection regulations. Resources may also be required to develop and maintain the software tools for data collection.

¹ This figure will be updated with surveys used to monitor indicator 4.3.1

These conditions require that adequate financial resources are available. Human resources are a significant portion of the budget, with funds needed to hire and train survey enumerators, supervisors, data analysts, and project managers. Investments in IT infrastructure may also be needed, for example for software purchases and for computers or tablets to support personal interviewing. Transportation and accommodation costs for survey teams, including to remote regions, also need factors.

However, national authorities, particularly those in low income contexts may lack the combination of financial and technical resources to effectively execute implement survey. Survey's may therefore be compromised by data quality issues, such as biased sampling linked to low quality sampling frames, non-response and missing data, and inconsistencies between responses, all of which limit reliability and the generation of meaningful data for monitoring and policy formulation.

Use of appropriate survey instruments

A survey is only as good as the questions it asks, and obtaining reliable information on the educational and background characteristics of survey respondents is dependent on suitable questionnaire text and framing. To inform comparison across surveys (and countries), questions should ideally follow a similar format where possible, while post-collection data processing can promote alignment. This section discusses common constraints in respect to key topic areas informing SDG 4 monitoring, ranging to educational attainment to literacy skills, and cross cutting issues such a socioeconomic background information and reference periods for questionnaire items.

Educational attainment, attendance, and alignment with ISCED

Data collection on educational attainment is a near universal feature of survey and census, and educational attendance to a lesser extent. However, the degree to which related survey instruments may inform monitoring of SDG targets such as attainment, completion and out of school rates varies.

Response categories for the highest level attained or attended often do not fully capture the diversity of education programmes in the national system. This can prevent disaggregation of education indicators by education level. For example, in many surveys tertiary education levels may be grouped together as a single response category, preventing estimation of attainment rates by ISCED levels five to eight. In a smaller number of cases, lower and upper secondary education are not distinguished, and combined into a single secondary education response category.

Certain education programmes may not be captured altogether, for example those concerning pre-primary and early childhood care, preventing calculation of SDG indicator 4.2.2 in certain surveys. Programmes in the sphere of Technical and Cooperation present challenges to data collection due to their diversity and smaller enrolment relative to general education, and their exclusion precludes accurate estimation of the participation rate of youth in TVET (indicator 4.3.3). Furthermore, few surveys collect data on participation in non-formal education, a component of global SDG indicator 4.3.1. This in part reflects both diversity of programme type, challenges for enumerators and survey respondents to define non-formal programmes, and constraints in the number of response categories that multi-topic surveys may include.

Response categories on educational attainment may not capture information on education programmes qualifications attained by older age cohorts that are not currently provided. Responses may also not allow international migrants to adequately report on qualifications attained abroad, potentially biasing estimates in contexts where migrants comprise significant proportions of the population.

Box 1: ISCED 2011 framework²

The International Standard Classification of Education is a globally recognized framework developed by UNESCO to categorize and classify educational programs and levels. ISCED helps facilitate international comparisons of education systems by providing a common scheme for describing and categorizing educational programmes qualifications, helping to ensure consistent and comparable data across different education systems globally.

ISCED is split into 9 levels, distinguishing between general and vocational education at levels 2 to five, and academic and tertiary education at tertiary levels 5 to 8.

0. Early childhood educational development (01) and pre-primary education (02)
1. Primary education
2. Lower secondary
3. Upper secondary
4. Post-secondary non-tertiary
5. Short-cycle tertiary
6. Bachelors and equivalent
7. Masters and equivalent
8. Doctorate or equivalent

Source: UNESCO (2012)

and attendance by ISCED level should ideally be computed by survey teams as part of post-processing. While analysts can accomplish such conversions using facilities such as the UIS ISCED Mappings³, doing so promotes further alignment. In this respect it is important that conversions reference the ISCED 2011 standard. However, in some countries, national statistical systems remain aligned to earlier version such as ISCED 97.

Question specification can also influence measurement error regarding educational attainment. As defined by ISCED, educational attainment is the highest ISCED level completed by the individual, and individuals who do not meet the completion requirements (such as failing final examinations) do not qualify for successful completion of the programme. Without clear question wording and framing, and enumerator guidance, respondents may misinterpret and misreport attainment. In addition to appropriate enumerator guidance and question pretext, it is advisable for surveys to query the highest grade attained and if that grade is completed, as is the practice with the 6th round of the UNICEF Multiple Indicator Cluster Surveys (UNICEF, 2023).

Differing reference periods

Variances between surveys in reference periods for which educational data is collected can affect comparability between surveys. This is clearly apparent where survey items are linked to events within

² The ISCED operational manual provides further guidance on how to categorize national education programmes (UNESCO, 2012).

³ See UIS (2023)

fixed time intervals. For example, indicators 4.3.1 on participation rates on formal and non-formal education training, and indicator 4.a.2 on the proportion of students experiencing bullying, are referenced the twelve months preceding interview. Estimates based on a shorter time period, such as the previous 3 months, will generally be lower.

To best inform national and international monitoring, survey items related to education attendance, such as out-of-school rates, should be linked to a particular school year, as should data collected on household educational expenditure. Since household surveys may span two school calendar years, or fall within term-end vacation periods, questions should therefore specify the school year of reference within the questionnaire items.

However, questions items often framed in terms of current attendance (for example “are you currently attending school?”), reducing comparability with administrative data, and with surveys referencing a specific school year. This framing also increases the potential for misunderstanding among respondents (for example, as to whether current attendance refers attendance on that day, or misreporting in the event the interview falls within a vacation period). Beyond linkage to a particular school year, questionnaire text should clearly define on the criteria for attendance (for example, “have you attended school at any point in the school year beginning in XXXX?”). Use of multiple response options corresponding to the extent of attendance may be considered to promote policy relevance and comparability between surveys.

Quality and comparability of individual background information

Sufficient data on household and individual background information is not only required to disaggregate indicators by socioeconomic factors such as wealth, but to inform comparable and accurate indicator calculation.

The vast majority of surveys collect data on respondents age in completed years, but data quality may be compromised in contexts of limited record keeping where respondents are not aware of their exact age for household members. This is evident in the phenomenon age-heaping⁴ or missing data by age, which can lead to bias in estimates. Based on an analysis of Demographic and Health surveys, age misreporting is estimation to affect approximately 5% of respondents in surveys administered in the sub-Saharan African region (Amos and Stones, 2017).

Higher fidelity information on age beyond total years completed is particularly relevant for attendance indicators corresponding to school aged populations, such as participation rates and over-age rates. Calculation of these indicators should preferably be based on the age of respondents at the beginning of the school year to ensure the school age population is correctly delineated, since age in completed years is not necessarily the same at the time of interview as when the school term starts. The implication here is that in the case of the former, students at the margins of the age group may be not in fact have been in the school aged group at the start of the school year, and would therefore not be expected to be

⁴ Whereby the tendency of respondents to round age to the nearest 5 or ten years leads to artificial distortions in the observed population structure.

attending school, or attending a different grade⁵. This artefact can lead to substantial differences in estimates of attendance, depending on whether age adjustment of made, with discrepancies typically multiple percentage points for indicators such as out of school rates, and more for indicators pertaining to a single year age group (Barakat 2016; UIS 2017).

Differences in the definition of socioeconomic background factors such as household wealth or income, migration and disability can notably affect comparability across surveys. For example, in regard to household wealth, assets used to derive a wealth index may vary between survey programmes, while total income is a distinct measurement subject to its own measurement challenges (Poirier et al 2020). Migration can be measured in terms of internal or international migration, in the latter by citizenship, country of birth or duration of residence in the country (de Brauw and Carlotta, 2012; United Nations, 2017). Disability can be measured in response to a dichotomous self-reported survey item, medically defined conditions or - as recommended - to particular tasks with which respondents have functional difficulties (Abualghaib et al. 2019)⁶.

Literacy, knowledge and skills

Learning outcomes monitored in SDG 4, such as indicators 4.1.1 and 4.6.1 on literacy and numeracy skills for children and adults are derived from specialized learning assessments and are further discussed in the accompanying conference background paper. For the purposes of international monitoring, on SDG 4.7.4 and 4.7.5 on skills for sustainable development among lower secondary aged students are primarily sourced from school-based assessments such as PISA, TIMSS and the ICLS (UIS,2021).

Multi-topic household surveys, and to a lesser degree census, can inform several additional SDG 4 indicators. For indicators SDG 4.2.1 and SDG 4.4.1, measurement frameworks have been developed to inform comparable measurement across countries. For the proportion of young children that are developmentally on track, the Early Childhood Development Index developed by UNICEF consists of a set of twenty questions administered to caregivers concerning child behaviour skills and knowledge (UNICEF, 2023b). To measure indicator 4.4.1 on the proportion of adults with ICT skills, monitoring is informed by question sets and toolkits developed by the International Telecommunications Union (ITU 2020).

However, due to the breadth and complexity (and potentially unclear definition) of the concepts on interest, knowledge and skills pose measurement and comparability challenges. This remains the case for indicator, 4.6.2 on the youth and adult literacy rate, for which there are no current internationally agreed standards.

In distinction to the global indicator for target 6 on functional literacy and numeracy, 4.6.2 is measured through short and simple instruments administered in household survey and census, and is often restricted to a single or small number of questionnaire items. This has advantages in cost and required technical capacity relative to complex learning assessments such as the OECD Programme for the International Assessment of Adult Competencies, which in the short to medium term remain out of

⁵ For example, if the starting age for primary school in a given education system is age 6, children who were aged five at the beginning of the school year, but aged 6 at the time of interview would be included in the school aged population.

⁶ For example, “do you have a severe disability (yes/no)”?

reach for many low and lower-middle income countries (Thorn, 2020). Yet while data availability is substantially higher than for indicator 4.6.1 - which relies on complex learning assessments - there is a trade-off on validity and reliability. Moreover, measures used to assess literacy under 4.6.2 tend to vary across surveys and countries, reducing comparability.

Simple measures of literacy of literacy can broadly be separated into two categories: respondent-reported and direct. Respondent reported measures which ask respondents - or a selected household member - whether they (or fellow household members) are literate, or query reported abilities on literacy relevant tasks, such as the ability to read a newspaper. Such instruments have the advantage of being easy to administer, and able assess literacy in multiple languages. However, self-assessed measures can have questionable validity, with a potential of respondents to exaggerate their abilities, or to vary in their understanding of literacy.

Direct measures of literacy are based on the enumerator assessed ability of respondents to complete a simple test, typically the ability to read a single or several short piece(s) of text. This has the advantage of potentially higher accuracy and reliability at assessing literacy skills - although at a basic level - and are generally recommended over or in supplementation to self-assessed measures. However, single item instruments as employed in multi-topic surveys, such as DHS and MICS are less suited to assessing text comprehension, and cannot be used to reliably linked to minimum proficiency levels as defined in functional literacy assessments used to monitor indicator 4.6.1.

Within self-assessed and direct forms of measurement, questions used to assess literacy vary for example in respect to the ability to both read and write (and whether numeracy is assessed), whether a household member reports literacy for others in the household, the number of languages assessed and complexity of the tests used to assess literacy (Montoya, 2018; Thorn 2020). Surveys can also differ in the populations that are administered an assessment, with only those below a certain level of educational attainment administered a literacy test (for example primary or lower secondary education). While doing so reduces costs associated with assessment, reliable associations between educational attainment cannot be assumed: those with no or little schooling are not necessarily illiterate, and in contexts with inefficient education systems, individuals with primary education or lower secondary education do not necessarily obtain basic literacy skills (Smith-Greenway, 2015). Indeed, use of educational attainment proxies for literacy are not recommended in UN Principles and Guidelines for Population and Housing Censuses (UNDESA, 2017).

Household education expenditure

Household expenditure on formal education is a major component of education expenditure at the national level, monitored under SDG 4.5.4 by level of level of education on a per student basis. Household surveys therefore form a key source of information. Collecting expenditure data via population surveys however has inherent challenges. Since education expenditure can encompass a wide variety of items which may be spread throughout the year and take place several months prior to interview, respondents may not accurately recall expenses, or otherwise be willing to share information perceived to be confidential.

Surveys can also differ significantly in the type and quality of expenditure data collected. Educational expenditure encompasses a range of categories, from tuition and registration fees, private tutoring, uniforms, textbooks and other learning materials, transportation and school meals. Data on expenses such as tuition fees, textbooks and uniforms are comparatively frequent, yet other significant expenses,

such as transportation and private tutoring, are less commonly collected⁷. Additionally, recall periods may differ between surveys, or may not fully capture expenses accrued during a given school year, while expenditures are frequently aggregated at the household level rather than linked to individual students (UIS 2017; UIS 2021).

Accessibility of survey data

A survey or census is of limited use if it is not made accessible, no matter how well designed and implemented. Indeed, access to data is part of the first principle of United National Statistical Commissions Fundamental Principles for Official Statistics (United Nations, 2013). In respect to survey and census data, accessibility applies not just to the statistics generated from these data sources, but also to the microdata and the associated metadata that summarizes and describes the studies and data files. Access to the latter is particularly relevant regarding SDG 4 monitoring, as agencies responsible for data production and analysis are not only situated with national statistical agencies, but within other ministries and outside government in civil society and international agencies.

Many surveys and census produced by national authorities remain unavailable for third party analysis, particularly in lesser developed countries. This is the case of survey micro data in particular, but also basic metadata. As a result, there is no comprehensive cross-country account of historical account of surveys and survey programmes, and even less information on the extent to which surveys can potentially inform monitoring of SDG 4.

Based on an analysis of eighty-three low and lower middle income countries a recent study found that 27 of these manage their own national micro data repositories for disseminating survey micro data and/or metadata (IWGHS, 2023). Moreover, among the 27 countries, several barriers to data access are evident. For half of surveys listed in the repositories, microdata was not available for download, and in only a third were data made available as public use files - for which access is granted after users agree to a basic set of conditions. Further issues were also identified when attempting to access data, with widespread problems in user registration to access microdata, broken redirect links, and errors in downloading files.

International survey repositories, such as the International Household Survey Network (IHSN) Data Repository and the World Bank Microdata library, are key resources for data dissemination. These platforms provide a facility to disseminate survey metadata files aligned to international standards to the public, as well as facilitating applications for microdata access. However, surveys conducted by national statistical offices or other national agencies are underrepresented in the IHSN Catalogue (IWGHS, 2023). Additionally, metadata files - either from national or international survey programmes – commonly metadata fields needed to assess survey methodology, coverage and identify relevant survey items for SDG 4 indicator calculation.

⁷ Additionally, not all surveys aim to account for total education expenditure, through including an 'other expenses' category.

4. Recommendations

Household surveys and census are an essential component of monitoring the SDG agenda, and SDG 4 in particular, acting as a key data source for many indicators. Governments and international partners have made notable progress in increasing the availability and relevance of surveys for SDG monitoring, but their full potential in informing monitoring of SDG 4 and the education sector more generally is yet to be realized.

Having passed the mid-point of the SDG 2030 agenda, many SDG 4 indicators remain compromised by issues affecting coverage, data quality and comparability. To increase the use and effectiveness of household survey and census in monitoring the agenda, the UIS makes the following recommendations:

Expand survey availability while following good practices in survey design and implementation

Large gaps remain in survey coverage across both across countries, with many countries unable to implement and sustain survey programmes that are comparable over time and compliant with international standards. Low quality survey data impedes the generation of data to reliably monitor the SDG agenda, reflecting errors at various stages of survey implementation, including those resulting from poor sampling and questionnaire design, to lack of capacity and training among survey enumerators, and weak data editing, quality control and analysis.

To overcome these challenges, governments, international organizations, and development partners must collaborate to provide more sustainable and predictable financial support, technical expertise, and capacity-building initiatives. Investments in technology, training, and infrastructure can enhance the capabilities of low-capacity environments to conduct nationally representative household surveys, leading to more accurate and reliable data for informed decision-making and sustainable development in these regions.

Technical expertise is vital in crafting suitable instruments, determining the appropriate data collection techniques, and selecting the right sampling methodology, which encompasses decisions on the survey's scope, sample size, and questionnaire design. Comprehensive training for enumerators and data collection teams, coupled with robust quality control measures at different stages of the survey, including data collection, entry, and analysis, are essential. These quality measures should comprise performance monitoring of enumerators, spot-checks, and maintaining data accuracy, consistency, and completeness.

Building technical capacity is a long-term process in many countries. Survey implementers should however align with international principals and best practices where possible, such as United Nations guidelines on Designing Household Survey Samples (UNDESA, 2008), Principles and Recommendations for Population and Housing Censuses (UNDESA, 2017), along with UIS guidance on the implementation of household surveys for SDG 4 monitoring (UIS, 2020).

Lack of capacity to monitor and assess quality remains an ongoing challenge. This partly reflects lack of protocols and standards for data quality assurance. National authorities may however draw from protocols established as part of international survey programmes, such as the UNICEF Multiple Indicator Cluster Survey data processing and editing guidelines (UNICEF, 2023). In respect to education data,

quality control procedures can include steps such as ensuring consistency between responses on relevant survey items⁸, or using data imputation when it can be reliably inferred.

Increase the accuracy, validity and comparability of survey items

Across countries, surveys implemented by national authorities and international partners collect a range of relevant data for monitoring the SDG 4 agenda. The degree to which education indicators can accurately be calculated and inferences reliably made between surveys however is impeded due to limitations with common survey instruments to collect educational and individual background data. To some extent this reflects lack of agreement on guiding principles on collecting relevant and comparable education data.

Where practical, the following steps are recommended to improve data collection and monitoring:

Educational attainment and attendance survey items should cover all major national education programmes. Response categories should allow respondents to report attainment or current attendance in national education programmes and those that lead to officially recognized qualifications, including programmes defunct at the time of interview, but which may comprise the highest level of attainment for significant numbers of respondents. Reporting of combined education categories (e.g., 'no education/pre-primary', 'secondary education', or 'higher education') should be avoided to the extent possible.

Align data collection and survey processing with ISCED. As part of data editing processes, and to support comparative analysis, educational attainment and attendance data should preferably be reported by ISCED level via derived variables, using the ISCED 2011 standard⁹. To support such transformations by survey teams, as well as third parties, national authorities are encouraged to keep ISCED mappings reported the UIS up to date and as comprehensive as possible.

Report participation in TVET and non-formal education. In aligning with ISCED 2011, educational attendance may be reported by vocational or professional orientation, within each ISCED level. For non-formal educational programmes and training that does not lead to recognized qualifications - and which therefore does not fall under ISCED - distinct survey instruments or response categories may be implemented.

Expand survey items on attainment and attendance. To improve reliability of data, and support mapping of national education programmes to ISCED, surveys should preferably query respondents on the highest grade they have attained or are currently attending. In respect to attainment, and following the format of MICS 6, a separate survey item querying respondents if they have completed the highest grade attended is advised. For educational attendance, an additional item querying the extent of attendance in a reference year (e.g., partial, full etc) provides relevant context and facilitate comparability.

⁸ For example, that individuals who reported never having attended school in one survey item do not also report attending school in the current year in another; or that respondents do not report attaining or attending a grade for a given educational programme that exceeds the duration of that programme. Assisted by computer assisted interviewing, such checks should take place during enumeration, but also form part of post-collection processing.

⁹ In addition to reporting by national programme.

Rationalize and align reference periods. Data on formal educational participation - such as school attendance or household education expenditure - should in most cases be referenced to a particular school year to increase relevance for planning purposes and promote comparability between surveys and with administrative data. For other indicators specified in time intervals, data collection should also preferably be aligned to reference periods of SDG 4 indicators, such as participation in formal and non-formal education during the past 12 months. With an aim to maintaining backwards comparability, doing so can entail replicating the same item for different reference periods, rather than modifying existing items.

Collect sufficient respondent background information. To facilitate correct and comparable calculation of attendance rates - and specifically calculation of the age of students at the beginning of the school year - surveys should collect and disseminate data on the respondent month of birth, along with the interview date, whilst ensuring data security and confidentiality. Alternatively, survey teams may calculate the age at the beginning of the school year as part of post data collection processing. To support indicator disaggregation, relevant contextual information such as respondent location, household income/wealth, migration and disability status should be collected, aligned to internationally agreed definitions and measures where available.

Increase the quality of instruments on literacy. Monitoring of indicator 4.6.2 can be improved through increasing the validity of basic measures of literacy. This should include simple enumerator administered tests of literacy abilities. Such tests need not replace self-assessed literacy items - which have inherent advantages in multi-lingual contexts- but can be complementary¹⁰. Basic literacy tests are frequently implemented as single item instruments regarding the ability of respondents to read a simple sentence. Further work and collaboration are however required to design short-multi-item tests that offer comparability with minimum proficiency levels defined in learning assessments used to monitor indicator 4.6.1. Regardless of the assessment, it is recommended that it is administered to all youth and adults, rather than restricted to those below certain levels of educational attainment, as commonly practised.

Account for household education expenditures. Where feasible, household surveys should collect comprehensive data on education expenditures. Following guidelines (Oseni et al. 2018; UIS, 2021), survey items should capture detailed expense items that extend beyond tuition fees to account for total expenditure, with expenditures preferably linked to individual students within the household.

Improve the accessibility of survey micro data and metadata

Monitoring of SDG 4 is not just impeded by limited survey coverage across countries and over time, but by survey accessibility. For the latter, barriers can be remedied relatively easily and at low cost. To support the monitoring of the SDG 4 agenda, it is crucial that statistical agencies and national authorities facilitate access to survey data, both across government and to third parties. Whilst ensuring guards on data security and privacy, data files should preferably be made for public use, allowing users to access data upon registration and agreement to basic conditions. Furthermore, complete metadata should be made publicly available regardless of the conditions for micro data accessibility, and preferably published

¹⁰ Scope also exists to improve self-assessed instruments, which have comparably limited validity and scope compared to model question sets developed by UNESCO (see UNESCO 2008).

within international survey repositories. Such information, which encompasses descriptive and summary information on survey design and data collected, is necessary for analysts to assess quality and identify surveys and survey items relevant for SDG 4 monitoring.

A variety of tools and standards are freely available to support statistical agencies in improving accessibility (Dupreiez and Asghar, 2022). These include open-source facilities such as the International Household Survey Network's NADA software, that facilitates data producers in cataloguing survey data, establishing a micro data repository and publishing survey data files. Survey metadata should preferably be aligned to the Data Documentation Initiative (DDI) international codebook standard, which provides guidance on standard metadata fields and promotes data discovery, exchange and interoperability.

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