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TRACKING INCLUSION: DATA SOURCES ON INCLUSIVE EDUCATION IN SUB-SAHARAN AFRICA

DATA AND EVIDENCE FOR EDUCATION PROGRAMS (DEEP) PROJECT

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ACRONYMS AND ABBREVIATIONS

CFM	Child Functioning Module
DEEP	Data and Evidence for Education Programs
DHS	Demographic and Health Surveys
EMIS	Education Management Information System
LSMS	Living Standards Measurement Study
MICS	Multiple Indicator Cluster Surveys
MYS	Mean Years of Schooling
SWTS	School-to-Work Transition Survey
SDG	Sustainable Development Goal
UIS	UNESCO Institute for Statistics
UNESCO	United Nations Education, Scientific, and Cultural Organization
UNICEF	United Nations Children's Fund
WGSS	Washington Group Short Set

1. INTRODUCTION

The concept of "leave no one behind," at the heart of the 2030 Agenda for the Sustainable Development Goals (SDGs), aims to eradicate all types of disadvantage throughout the world. To realize this vision, people with disabilities must be fully included in development efforts. People with disabilities face a multitude of physical, attitudinal, and institutional barriers that put them at high risk of being left behind. A growing body of evidence points to those with disabilities being disproportionately poorer, less educated, and less able to secure a livelihood (Mitra et al. 2013; Mizunoya et al. 2016; World Health Organization and World Bank 2011).

Assessing the need for interventions, designing policies, and evaluating their impact requires high-quality data. Often, data on disability has not been collected or has been of poor quality, at times leading to confusion (Mont 2007). Fortunately, global efforts have led to a growing consensus on how to best measure disability in censuses, surveys, and administrative data (Cappa et al. 2018; Groce and Mont 2017; Loeb et al. 2018; Mont 2019). As a result, more data being collected are of higher quality and more internationally comparable. This development provides increasingly strong data that can help programs and policies leave no one behind.

This report reviews available data sources regarding disability status and inclusive education across Sub-Saharan Africa. The Data Sources section discusses the various data sources that contain information on learner disability status, including census data, survey data, and administrative (EMIS) data. The Challenges section reviews issues that make it difficult to use and analyze disability data, including challenges in comparability, sample size, sampling frame, and data availability. Annex A of this report provides data tables with information on school attendance, out-of-school rates, school completion, mean years of school, and literacy rates for learners with disabilities across Sub-Saharan Africa. Annex B provides an explanation of how data were selected and used in this review.

1.1 IDENTIFYING CHILDREN WITH DISABILITIES FOR QUANTITATIVE ANALYSIS

In 2002, in response to global concern over the quality of disability data, the United Nations Statistical Commission formed a city group on disability statistics. With membership open to all national statistical offices of United Nations member countries, and named after the city of the inaugural meeting, The Washington Group was given the mandate of developing high-quality, internationally comparable measures of disability for quantitative analysis.

The first product of The Washington Group was a set of six questions, known as the Washington Group Short Set (WGSS), for identifying people with disabilities in censuses. These questions were informed by the bio-psychosocial model of disability, which forms the basis for the World Health Organization's International Classification of Functioning and is in line with the Convention on the Rights of Persons with Disabilities. The WGSS identifies people as having a disability if they have a lot of difficulty in or cannot do at least one of six basic activities (seeing, hearing, cognition, mobility, communication, and self-care), which thus puts them at risk of exclusion if they face barriers in the environment (Mont 2007).

Disability data needs to be collected and disaggregated in a certain way to gather information about limitations in basic activity functioning among national populations to then have comparable data cross-

nationally for populations living in a variety of cultures and varying economic resources. The purpose is not to identify every person with a disability in every community, but to identify persons with similar types and levels of limitations in basic activity functioning regardless of nationality and/or culture. The Washington Group question set is simple, brief, and comparable, and it identifies limitations in domains of basic activity functioning that are found universally, that are most closely associated with social exclusion, and that occur most frequently. The intent is to compile information that represents the majority of people with the most commonly occurring limitations in basic activity functioning within any country, as well as capture persons with similar disabilities across countries. The disaggregated data would then allow for comparison of participation of persons with disabilities in education, employment, family life, and overall social inclusion (Washington Group on Disability Statistics 2020).

The Washington Group acknowledged that although the WGSS identifies the large majority of people with disabilities, it was not the best tool for identifying *children* with disabilities (Loeb et al. 2018), for two reasons: (1) the questions are not suitable for children under the age of 5, and (2) they miss many children with developmental disabilities.[1] For this reason, The Washington Group partnered with the United Nations Children's Fund (UNICEF) to create the Child Functioning Module (CFM), specifically designed to identify children with disabilities in household surveys. Finalized in 2016, the CFM consists of separate modules for children aged 2–4 years and those aged 5–17 years. UNICEF and The Washington Group determined that to identify children under the age of 2, assessments that go beyond the ability of a household survey are required.

Data from the CFM can be disaggregated by the type(s) of disabilities a child has, such as sensory, physical, intellectual and developmental, and psychosocial. In addition, the CFM questions are worded to delineate the degree of disability.

The CFM provides a well-tested methodology that identifies a large majority of children who are at risk of exclusion because of functional limitations. This is particularly well-suited for statistical analyses aimed at uncovering patterns of prevalence in disability. For example, how many children have disabilities, and if that differs by age, sex, or region of residence. The CFM is also well suited for disaggregating outcome indicators by disability; for example, comparing the school attendance rates of children with and without disabilities to determine the extent to which they face barriers to education.

However, the CFM is not detailed enough to necessarily identify all students with disabilities. As with any set of survey questions, there will be some false positives and false negatives. The CFM is not sufficient for determining a child's eligibility for a disability program or designing services for specific children. However, it could be used as a screening tool to determine which children are most likely in need of a more detailed assessment. It should also be noted that although the CFM will identify most children with diagnoses such as autism or attention deficit hyperactivity disorder as having a disability, it is not capable of providing a diagnosis of these conditions. It only identifies the functional domains where children are having difficulties.

The CFM was designed to be answered by a child's primary caregiver; after consultations with child development experts, UNICEF and The Washington Group determined that children were not reliable respondents for assessing their difficulties, compared to their peers, in doing a wide variety of activities. However, according to some recent research, children's self-responses have stood up to test-retest

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[1]The WGSS also misses a significant number of people with psychosocial disabilities. This area is addressed in the CFM and, for adults, in the Washington Group Extended Set, developed after the WGSS.

reliability (Ng et al. 2020). In some cases, the CFM has been adapted for having teachers as respondents within education management information systems (EMISs); in Fiji, for example, it is used not only for statistical purposes but also for referring children for services and further screening (Mont and Sprunt 2019).[2] In addition, UNICEF and The Washington Group are testing a shortened version of the CFM geared toward teacher respondents. This shorter CFM has recently undergone its first testing in Senegal, with promising results (Deleu, Brus, and Loeb 2019).

Finally, it is important to keep in mind that although the CFM is capable of providing vital information on the situation of children with disabilities, it does not provide information on appropriate policies for equalizing outcomes. Exclusion results from the interaction of individuals' functional limitations with barriers in the environment. To design policies that promote inclusion, information on the environment is needed to identify those barriers.

2. DATA SOURCES

Data sources fall into three broad categories: censuses, surveys, and administrative data. Each source is useful, but has relative advantages and disadvantages. All three can be made more effective by taking the same approach to identify people with disabilities. In this case, they can be used in conjunction with each other.

2.1 CENSUS DATA

The primary advantage of a census is that it attempts to include all people in a country. This provides a large enough number of observations to look at sub-populations, such as by geographic area, gender, ethnicity, and type and degree of disability (see Exhibit 1). However, this comprehensiveness also means censuses are done infrequently (usually every 10 years) and are limited in length. Because of these length constraints, censuses are highly unlikely to use the CFM. If they use the WGSS, they are only suitable for children age five and older and thus will miss many children with developmental disabilities.

According to the Education Equity Research Initiative's *Measuring Equity in Education* report (2016), "population censuses [frequently]...reflect local understandings of disability and priorities for data collection, which sometimes inhibit international comparisons." Among the census data used in this report, only one country, South Africa, uses the WGSS to its full extent. Tanzania uses five of the six WGSS questions. The other three countries (Ghana, Rwanda, and Zambia) allow only binary responses (yes/no) to disability status and do not cover all six domains of disability outlined in the WGSS. Except for South Africa, the census data reviewed here measures literacy with a binary response (yes/no) as to whether the respondent can read and/or write in any language.

2.2 SURVEY DATA

The main advantages of surveys stem from their smaller scale, which means they can (1) ask more questions, (2) be conducted more frequently, and (3) include better training for interviewers. However,

[2] The Fiji approach is being used to modify the administrative data systems in Indonesia and Vanuatu.

their smaller sample sizes generally limit disaggregation by subpopulations, especially by type and degree of disability (see Exhibit 1).

Because surveys collect much more extensive information, disability can be examined with respect to more socioeconomic variables than are available in a census. Still, space constraints exist. Many surveys using The Washington Group questions have opted for the WGSS for this reason, which creates the same problems as in a census. However, the newest round of UNICEF's Multiple Indicator Cluster Survey (MICS) is using the CFM and is generating much better data on children with disabilities in many countries.

Another approach to including disability questions in surveys is to have special modules attached to ongoing surveys, such as the Demographic and Health Surveys (DHS) Disability Module which was a result of a collaboration between DHS, USAID, and The Washington Group on Disability Statistics. This allows more extensive questions, but with the tradeoff of collecting the data less frequently. Special modules also allow more questions on the environment.

The most extensive source of data is a special survey on disability, such as the Tanzania Disability Survey conducted in 2008 (Zanzibar National Bureau of Statistics 2008). Because of the cost—especially if sample sizes are enlarged to facilitate disaggregation by type and degree of disability—these would have to be done less frequently. Special disability surveys may be particularly appropriate for examining the barriers to inclusion. Barriers do not have to be measured every couple of years to design policies because, unfortunately, these barriers do not change quickly. However, monitoring the situation of people with disabilities should be done more frequently to understand whether policies are having an effect.

Common international surveys that can encompass questions on disability status data include the Demographic and Health Surveys (DHS), the MICS, the Living Standard Measurement Surveys (LSMS), and School-to-Work Transition Surveys (SWTS) (see Exhibit 1).

One problem with surveys is that the sampling frame often excludes people living in institutions or people who are homeless. Both of these populations are most likely disproportionately composed of people with disabilities. Some countries have tried to account for this, such as in Vietnam's recent national disability survey, which supplemented the household sample with a census of institutions (Statistical Publishing House 2016).[3]

If censuses, ongoing surveys, and special modules (or special surveys) use the same approach to identify children with disabilities, then they can be used together. For example, if a census uses only the WGSS but a survey uses the CFM, the survey results can be used to estimate how many children with disabilities (and what types) are being missed by the WGSS. This is only possible because the CFM and the WGSS both measure the level of difficulty people have doing basic activities. Census results can then be extrapolated based on the survey findings to make estimates for smaller subpopulations. If the census uses a different approach (for example, if it only asks if people "have a disability"), then survey data using the CFM should not be used for making census extrapolations.

[3] https://www.gso.gov.vn/default_en.aspx?tabid=515&idmid=5&ItemID=19055

Exhibit 1: Main Sources of Disability Data

	FUNDING ORGANIZATION	APPROXIMATE FREQUENCY OF DATA COLLECTION	TOOL USED	NATIONALLY REPRESENTATIVE SAMPLE OF INDIVIDUALS WITH DISABILITY	LEVEL OF DISAGGREGATION POSSIBLE GIVEN QUESTIONNAIRE					EDUCATION DATA ROUTINELY DISAGGREGATED BY DISABILITY STATUS
					DISABILITY YES/NO	DISABILITY TYPE	AGE	SEX	POVERTY	
National census	Local government	10 years	Disability	✔	✔	Generally, not	✔	✔	✔	✘
International surveys										
DHS	USAID/ Local government	5 years	Functioning: WGSS	✔	✔	✔	✔	✔	✔	✘
MICS	UNICEF/Local government	3-5 years	Functioning: CFM	✔	✔	✔	✔	✔	✔	✔ for MICS6
LSMS	World Bank/ Local government	No regular frequency	Functioning: WGSS	✔	✔	✔	✔	✔	✔	✘
SINTEF	Norwegian Agency for Development Cooperation	No regular frequency	Functioning: WGSS	✔	✔	✔	✔	✔	✔	✔
SWTS	International Labour Organization	No regular frequency	Functioning: WGSS	✔	✔	✔	✔	✔	✔	✔
Project-based school survey	Various	Project dependent	Functioning, disability, screening	Generally, not	✔	✘	✔	✔		✔
School census	Local government	Annual	Disability	✘	✔	✘	✔	✔		Generally, not

2.3 ADMINISTRATIVE DATA

The third source, administrative data, is collected in the course of running a program. These data can be governmental administrative data, such as that from an EMIS, or data from a program run by a non-governmental organization or any other entity. The advantages of administrative data are that they contain information on everyone in a program and are generally collected on an ongoing basis. Administrative systems can also collect information on all aspects of a program. For example, an EMIS can collect information on the school environment. EMISs have untapped potential. OpenEMISs funded by the United National Educational, Scientific, and Cultural Organization (UNESCO) have the potential to capture the prevalence of students with disabilities enrolled in school, student performance, resource allocations, accessibility of facilities, and availability of adapted materials.

If a consistent approach to disability identification is taken across different data collection efforts, then data from different sources (administrative and statistical) can be used in conjunction with each other. This can help in cross-ministerial communication and coordination, and in using statistical data to make projections of how population trends and administrative reforms can affect outcomes. Often data from different systems use different approaches so differences in reported data on disability can be confusing. It should be noted that a consistent approach to disability data collection does not mean that all programs must have the same eligibility criteria, only that their data collection includes (though need not be limited to) a functional approach. A UNESCO review (2019b) of EMIS forms from 70 low- and middle-income countries found that 51 forms collected data on children with disabilities, although the quality of the data varied. Nine countries simply listed children as having a disability or being classified as a special-needs child with no further explanation, while 42 countries identified children as having a disability based on their functional difficulties, the existence of a particular impairment, or both. This study reviewed the availability of disability data in 25 Sub-Saharan African countries, 22 of which captured data on children with disabilities. Three of the countries with disability data indicated only whether the child had special needs (Exhibit 2), whereas the rest provided some disaggregation by type of disability (UNESCO 2019b).

Exhibit 2: Disability Data Available in the EMIS by Sub-Saharan Africa Country

COUNTRY	YEAR	CONTAIN DATA ON STUDENTS WITH DISABILITIES	IDENTIFIED ONLY BY "DISABILITY" OR "SPECIAL NEEDS"	VISION, HEARING ONLY	VISION, HEARING, PHSYICAL, INTELLECTUAL	INCLUDES AT LEAST SOME MEDICAL DIAGNOSES
Burundi	2018	✔	✘	✘	✘	✘
Congo	2015	✔	✘	✘	✘	✘
Cote d'Ivoire	2018	✔	✘	✘	✘	✔
Ethiopia	2004	✔	✘	✘	✘	✘
Gambia	2013	✔	✘	✘	✔	✘
Ghana	2014	✔	✘	✔	✔	✘
Guinea	2014	✔	✔	✘	✘	✘
Kenya	2015	✔	✘	✘	✔	✘
Lesotho	2014	✔	✘	✘	✔	✘
Liberia	2013	✔	✘	✘	✘	✘
Madagascar	2010	✘	✘	✘	✘	✘
Malawi	2018	✔	✘	✔	✘	✔
Mali	2018	✔	✘	✘	✔	✘
Mauritania	2016	✘	✘	✘	✘	✘
Mauritius	2014	✔	✘	✘	✘	✘
Namibia	2018	✔	✔	✘	✘	✘
Niger	2018	✔	✘	✔	✔	✔
Senegal	2018	✔	✘	✘	✘	✘
Sierra Leone	2013	✔	✘	✘	✘	✔
South Africa	2018	✔	✘	✔	✔	✘
South Sudan	2010	✔	✘	✔	✔	✘
Swaziland	2013	✔	✔	✘	✘	✘
Tanzania	2014	✔	✘	✘	✔	✔
Togo	2017	✘	✘	✘	✘	✘
Uganda	2008	✔	✘	✘	✔	✔
TOTALS:	25	22	3	5	10	6

Source: UNESCO, 2019b

The rate of collecting environmental data was much lower, and there was a great deal of variation in how information on infrastructure and adapted infrastructure was collected, from basic to more extensive. Approximately one-third of the countries with infrastructure information had questions about disability-accessible infrastructure, the most common being related to the existence of accessible toilets and ramps. Of the Sub-Saharan African countries reviewed, only Liberia and Rwanda included data on adapted infrastructure and materials in school facilities. Few countries addressed the issue of adapted materials, an exception in Africa being South Africa. It should be noted that the percent of EMISs asking any questions related to accessibility in 2019 was significantly higher than an earlier UNICEF review (UNICEF 2016).

A disadvantage of administrative data is that these data exclude people who are not in the program. For example, an EMIS does not have information on children who are out of school. However, if a country's EMIS and MICS use the same methodology for identifying children with disabilities, then (as with the example above for surveys and censuses), the two datasets can be used in conjunction with each other.

Two other disadvantages of administrative data are that EMISs frequently have data quality issues and missing data. Below is a listing of factors that affect the quality of EMIS data.

Factors Affecting the Quality of EMIS Data

The effectiveness of data in meeting the goals of the EMIS is influenced by several factors, ranging from how the data tools are developed to how the data is collected:

- *Topics covered:* The goal of an inclusive EMIS is to support the development and implementation of more inclusive policies and programs. Therefore, it is important that EMISs collect information on children and on the environment because exclusion results from the interaction between a child's functional limitations and barriers in the environment.
- *Question design:* Questions need to be written appropriately to elicit the necessary information. For example, merely asking whether a child has "has a disability" is not very helpful in determining what actions need to be taken (and leads to under-identification of children with disabilities). It is more appropriate to know what the child has difficulty doing, so their needs can be addressed. All questions should be evaluated in terms of how the answers can help the system improve its outcomes.
- *Question testing:* Research clearly shows that questions that seem straightforward to the people writing them can be interpreted differently by respondents—especially when translation to different languages is involved. To ensure high-quality data, any data collection tool must be properly tested, not just with a field test but through cognitive interviewing.
- *Identification of Disability:* The quality of the data can be affected by not including children with disabilities that have not already been pre-identified.
- *Selection of respondents:* The quality of the data can be affected by the choice of respondent. Teachers are more appropriate for collecting data on individual children, but a head teacher or school administrator could be appropriate for collecting information on school infrastructure.
- *Training of respondents:* Training programs that explain the nature and purpose of each question will generate not only higher-quality data, but also data that is more consistent across teachers and schools, and over time. Fiji, for example, has extensive training material, and even guidance on how to answer the questions built into the form.
- *Timing:* EMISs are often implemented at the beginning of a school year. For information on children, this can be problematic, because some disabilities are not as visible initially. However, collecting data early is sometimes important for programmatic purposes. A higher-quality system allows for updates to the information as the school year progresses. This is more possible with a granular, electronic system.
- *Coverage:* Out-of-school children are not covered by an EMIS, but EMISs can sometimes miss other children, including those in special schools and institutions and those being home-schooled with support from the state.
- *Enforcement:* In many countries, there are complaints about schools not fully complying with reporting requirements, by either not responding to particular sections of an EMIS form or not reporting at all. This creates missing data and biases the results, as non-reporters are not a random group. EMIS data should be evaluated in light of the level and type of non-responses.

2.4 CHALLENGES

2.4.1 COMPARABILITY

Care must be taken when it comes to international comparability:

> *Even when responses can be harmonized under a common variable, like disability status, IPUMS cautions that comparability across surveys is complicated by differences in questionnaire phrasing, what counts as a disability, and how severe a condition must be to be labeled a disability. Peters (2008) adds that the social stigma of identifying oneself or a family member as disabled leads to underreporting in some settings (Education Equity Research Initiative).*

The WGSS and CFM were designed to be internationally comparable and were tested across countries in all regions and income categories (Altman 2016). Cognitive testing supports comparability in general, but differences can still exist in how respondents interpret the questions, especially if translation was not done properly.[4] Also, some countries claiming to use the WGSS or the CFM modify the questions, undermining their effectiveness by, for example, first asking whether a person has a disability, and then only asking the WGSS or CFM questions if the respondent says "yes" or adding an introductory phrase, such as "We are now going to ask you questions about disability." Such an approach could affect how respondents answer, due to stigma or a preconceived notion of what they see as a disability. Therefore, it is very important when analyzing data—and especially when making comparisons across programs or countries—to compare exactly how the data were collected: what questions were used, how they were translated, how the interviewers were trained, and how the data collection process was implemented.

During our review of different survey data, we encountered the following challenges with comparability of education indicators disaggregated by disability status:

- **Different surveys may include different answer choices.** For instance, the DHS and MICS include three answers for the question about adult literacy: "cannot read at all," "able to read only parts of a sentence," or "able to read whole sentence." The LSMS includes only a binary choice ("yes" or "no"). This difference could affect the comparability of estimates for adult literacy.
- **Different surveys may capture constructs that are not exactly the same.** For instance, the DHS and MICS ask adult respondents who did not attend higher education to read a written sentence and for the interviewer to note whether the respondent could read it at all or not. On the other hand, the LSMS asks whether the respondent could read *and* write. This difference could affect the comparability of estimates for adult literacy.
- **Different surveys may have different variables available for the estimation of the same indicator.** For instance, six variables were used for estimating the out-of-school rate using the DHS and MICS: "highest educational level attained," "member attended school during current school year," "educational level during current school year," "grade of education during current school year," "member attended school during previous school year," and "educational level during previous school year." This is compared with just three variables in the LSMS: "Have you ever attended school?" and "Are you currently attending school?" combined with "What is the highest

[4] For the Washington Group's recommended translation protocol, see www.washingtongroup-disability.com.

grade you completed?" to capture instances of preschool or nonformal education. This difference could affect the comparability of estimates for out-of-school and attendance rates.

- **Different surveys may process data differently.** For instance, the DHS includes one variable for "educational attainment," with the values "no education," "incomplete primary," "complete primary," "incomplete secondary," "complete secondary," and "higher." The LSMS includes two variables for producing an equivalent education attainment variable: "What is the highest grade you completed?" (with the grades grouped into their appropriate education levels) and "Have you ever attended school?" (to identify those with no education). This required a review of other documentation to map grades to their respective education levels. Although the MICS includes a variable equivalent to one in the DHS, this was not present in the reviewed MICS dataset. Instead, the project team combined the variables "What is the highest education level you reached?" and "What is the last grade you attained within this level?" to construct the education attainment variable. This also required a review of other documentation to map grades to education levels. These differences could affect the comparability of the estimates for completion rate. Concerning disability status, the DHS and MICS classify an individual as having a functional difficulty if they report having "a lot of difficulty" or "cannot do." Other surveys, including SINTEF, also include individuals who report "some difficulty" in their categorization of individuals with functional difficulties.
- **Surveys may not collect variables needed for an indicator.** For instance, none of the datasets reviewed from the DHS, LSMS, and MICS5 included a variable for children's proficiency in mathematics. As a result, estimates could not be computed for the percentage of children proficient in mathematics. Apart from MICS6, which measures children's reading and mathematics ability in the early grades, literacy data are available only for those 15 years and older.
- **Surveys may use different codebooks.** For instance, although the DHS datasets use the same variable names, each LSMS dataset had a different variable name, depending on the country. As a result, the LSMS first needed to have its variable names harmonized before a statistical program developed to analyze LSMS data could be used. Because the DHS, LSMS, and MICS have their own codebooks and data structures, harmonizing these data across surveys to compute indicators can be time-consuming. There might be a gain in efficiency if the data producers working on each survey produced the estimates themselves, although this could raise concerns about whether the estimates are being produced in a consistent manner.

Example Disability Questions by Disability Data Tool or Source

Washington Group Short Set

Do you have difficulty hearing, even if using a hearing aid?

a. *No – no difficulty*
b. *Yes – some difficulty*
c. *Yes – a lot of difficulty*
d. *Cannot do at all*

Child Functioning Module

Does (name) use a hearing aid?

a. *Yes*
b. *No*

If Yes: When using his/her hearing aid, does (name) have difficulty hearing sounds like peoples' voices or music? Would you say (name) has:

a. *No difficulty*
b. *Some difficulty*
c. *A lot of difficulty*
d. *Cannot do at all*

If No: Does (name) have difficulty hearing sounds like peoples' voices or music? Would you say (name) has:

a. *No difficulty*
b. *Some difficulty*
c. *A lot of difficulty*
d. *Cannot do at all*

Rwanda Ministry of Education

Functional difficulties/Level	*Primary 1*			…	*Primary 6*		
	Male	*Female*	*Total*		*Male*	*Female*	*Total*
Hearing Impairment							

South Africa Ministry of Education

Hard of Hearing: Learners who experience a moderate hearing impairment and who are in need of additional specialized support. Hearing must be assessed through an auditory test and the decibel loss must be more than 31dB for persons under the age of 15 and more than 41dB for persons 15 years and older.

Deafness: Learners who experience a severe hearing impairment and who depend on specialized educational support. Hearing must be assessed through an auditory test and the hearing loss should be more than 61 dB at 0,5; 1; 2 and 4KHz in the better ear.

	Number of Pre-Grade R learners experiencing barriers to learning per PRIMARY barrier to learning, year of birth and gender. (Learners may NOT be double-counted.)		
Year of birth	*Gender*	Deafness	*Hard of Hearing*
≥2013	*Male*		
	Female		
2012	*Male*		
	Female		

Nigeria 2018: Brief comparability analysis

Comparability issues can be highlighted if data exists from two surveys conducted in the same country.

For instance, the project team acquired data from two surveys for Nigeria in 2018. Estimates were produced using data from the DHS and LSMS to enable a brief comparability analysis. Security concerns affected both surveys' data collection, with interviewers prevented from visiting some communities. As a result, estimates based on the DHS and LSMS are representative of areas in Nigeria that were accessible but do not reflect conditions in conflict-affected areas during this period (Pullum, 2019).*

Although the percentage of respondents with disabilities in the LSMS data was twice that in the DHS data (2.8% in LSMS, 1.4% in DHS), when focusing on the percentage among the school-age population only, similar percentages were found for boys (11% in LSMS, 13% in DHS) and a higher percentage was found for girls in the DHS data (8% in LSMS, 13% in DHS). Out-of-school rates for all children were similar (36% in LSMS, 32% in DHS) but when focusing on only those with a disability the rates in the LSMS data were substantially higher (64% in LSMS, 48% in DHS). However, the reduced number of girls with disabilities in primary and lower secondary school in the LSMS data should be noted. The mean years of schooling were also similar (2.8 in LSMS, 2.9 in DHS), but estimates could not be produced for those with disabilities due to the reduced number of 25- to 29-year-olds in the LSMS data.

** For Nigeria DHS, see https://www.dhsprogram.com/pubs/pdf/FR359/FR359.pdf, p. 491. For Nigeria LSMS, see the Panel 4 report for GHS: https://microdata.worldbank.org/index.php/catalog/2734/related-materials, p. 2.*

2.4.2 SAMPLE SIZE AND SAMPLING FRAME

Sample size and sampling frame pose common challenges. Because individuals with functional difficulties make up a relatively small portion of the population, it is often difficult to obtain a sufficiently large sample of these individuals to ensure precise estimates of disability indicators. Confidence intervals are therefore quite wide (UNESCO 2019b).

The sample size problem is exacerbated when the indicator is calculated for a narrow age range (as it frequently is for education indicators). Sample size challenges severely limit the ability to disaggregate survey data by type and/or severity of disability, or by other demographic (sex, poverty, ethnicity) or geographic (region, urban/rural) characteristics. At times, the cell size (or sample of the subpopulation of interest) may simply be too small to permit reporting.

During our review of survey data, we frequently encountered issues regarding insufficient sample size. For instance, although the data reviewed from the DHS, LSMS, and MICS included disability variables and the variables necessary to compute seven of the nine indicators examined for this study, all seven indicators had at least one country for which the estimate for those with disabilities, broken down by gender, could not be reported because it was based on fewer than 25 observations.[5] Even when combining across gender, about 4 in every 10 estimates for those with disabilities could not be presented because they were based on fewer than 25 observations. This issue was particularly prevalent

[5] The UNESCO Institute for Statistics uses 25 as the minimum number of observations in its Disability Database.

for indicators that created subsets of the data to include a narrow age group, such as completion rates (4-year age range) and mean years of schooling (5-year age range). Some of these issues were due to this study's capping the age for some indicators at 29 years. If types of disability are to be examined, oversampling of the population with disabilities might be required. This will enable future studies to report reliable estimates for those with disabilities, broken down by gender. In The Gambia, for example, 10.1 percent of the population aged 5–17 has a disability, according to the MICS. That rate is 12.4 percent for boys and 8.0 percent for girls (UNICEF n.d.). Those rates are high enough to do a lot of significant analysis with a reasonably sized survey. However, when examined by type of disability, those prevalence rates are as follows: for seeing, 0.4 percent for boys and 0.3 percent for girls; for hearing, less than 0.1 percent for boys and 0.1 percent for girls; for walking, 1.2 percent for both boys and girls; and for learning 2.4 percent for boys and 0.8 percent for girls. Obtaining robust estimates of differences in how the disability type differs by gender requires either a very large sample or a sample designed to oversample children with disabilities.

Household census data are free of these sampling issues, although disability data might not always be collected or, as noted above, approaches used in collecting these data could result in underreporting.

2.4.3 AVAILABILITY OF DATA

International surveys—in particular MICS, DHS, and LSMS data—can be accessed easily for secondary data analysis. Detailed findings report for these surveys are also readily available. However, few reports include education data disaggregated by children's disability status. MICS6 reports are an exception to this rule. National census, EMIS/school census data, and reports are, in most cases, not readily accessible and require official requests to Ministry of Education EMIS departments. Some countries, such as Uganda and Zambia, post top-level census or school census data results on their websites, but even these tend not to routinely post information on students disaggregated by disability status.

Exhibit 3: Disability data source by country and latest year of available data or anticipated data collection

COUNTRY	INTERNATIONAL SURVEYS				NATIONAL CENSUS (AVAILABLE VIA IPUMS)	ADMINISTRATIVE DATA/EMIS
	DHS	LSMS	MICS	SINTEF ALL		EMIS
Djibouti	--	--	--	--	--	--
DRC	2013–2014	--	2017–2018	--	--	2015
Ethiopia	--	2016 2021–2022*	--	--	--	2004
Ghana	2017	--	2017–2018	--	2010	2019
Kenya	--	--	--	--	--	2015
Liberia	--	--	--	--	--	2013
Madagascar	--	--	2018	--	--	--
Malawi	2015–2016	2013	2019–2020	2018	--	2018
Mali	2018	2021–2022*	--	--	--	2018
Mozambique	--	--	--	2009	--	--
Niger	--	2021–2022*	--	--	--	2018
Nigeria	2018	2018–2019 2021–2022*	2020-2021*	--	--	--
Rwanda	2015 2019–2020*	--	--	--	2012	2018
Senegal	2014	2021–2022*	--	--	--	2018
Somalia	--	2021–2022*	--	--	--	--
South Africa	2016	--	--	2006	2011	2018
South Sudan	--	--	--	--	--	2010
Tanzania	--	2016 2021–2022*	--	--	2012	2014
Uganda	2016	2011 2021–2022*	--	2019*	--	2017
Zambia	--	--	--	2018	2010	--

*Anticipated surveys

3. CONCLUSIONS AND RECOMMENDATIONS

A lack of disability data creates a significant barrier to effective tracking progress in making education more inclusive and in identifying steps to increase inclusivity. With the adoption of the WGSS and CFM questions in major international household surveys, as well as the inclusion of disability-related variables in both national censuses and school census/EMIS systems, significant strides have been made. Issues related to insufficiently large sample sizes and lack of comparability of findings remain a challenge, even when similar tools are used to collect data. **Standardization of data collection tools and protocols, analysis, and data interpretation could help increase the comparability and quality of data.**

Sample designs routinely result in cell sizes that are insufficient to provide precise estimates on education indicators by disability status, let alone the type and degree of disability. **Increasing sample sizes by oversampling populations with disabilities in household-based surveys would increase the precision of findings and permit greater disaggregation of data.**

Data from household surveys, censuses, and administrative data serve different purposes. Taken together, these different sources have the potential to provide a much more holistic understanding of education among children with disabilities. However, these data collection efforts are not coordinated and approaches used in data collection across these instruments are not comparable. **Greater harmonization of data collection approaches and better coordination in data collection efforts** would ensure increased complementarity and comparability and could create the potential to link the resulting data. Coordinated planning of these data collection efforts should be considered at the country level.

Although international survey data are readily available, household censuses and school census/EMIS data are less easily accessible. In many countries, data are available only through official requests to the Ministry of Education EMIS department. Steps should be taken to increase the quality and routine accessibility of EMIS data.

Finally, available data frequently remain underutilized. Apart from the MICS6, which disaggregates education data by disability status, education data and disability data are not routinely cross-tabulated, and the link between disability and education is not a part of most standard reports. **Increasing the accessibility of existing disability data, increasing the standard reporting of education indicators by disability status, building the capacity to analyze the data, and using it appropriately** to determine policies and program investments or changes will be crucial as country and global programs continue their work to leave no one behind.

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ANNEXES

ANNEX A: DATA TABLES

DISABILITY INDICATORS BY COUNTRY, SOURCE AND LATEST YEAR

Exhibit A-1: Proportion of 15- to 29-Year-Olds Who Ever Attended School, by Disability Status and Sex

COUNTRY	YEAR	SOURCE	% OF PERSONS AGED 15–29 YEARS WITH A DISABILITY			% OF PERSONS AGED 15–29 YEAR WHO EVER ATTENDED SCHOOL, WITHOUT A DISABILITY			% OF PERSONS AGED 15–29 YEAR WHO EVER ATTENDED SCHOOL, WITH A DISABILITY		
			MF	M	F	MF	M	F	MF	M	F
DRC	2015	SWTS	9.5	9.9	9.2	97.8	98.7	96.9	95.0	95.3	94.6
Ethiopia*	2007	IPUMS	1.2	1.3	1.1	49.4	58.7	40.5	38.8	46.2	30.2
Ethiopia†	2015	LSMS	0.8	.	.	78.6	84.7	72.7	.	.	.
Ghana*	2010	IPUMS	2.1	2.1	2.1	83.2	86.7	79.9	74.8	77.7	72.1
Kenya*	2009	IPUMS	2.7	2.9	2.5	90.0	90.6	89.4	82.7	83.1	82.3
Liberia	2008	IPUMS	2.2	2.2	2.1	66.5	74.3	59.1	57.0	63.2	51.0
Liberia	2012	SWTS	3.1	2.9	3.2	90.4	95.3	86.1	(59.8)	.	.
Liberia	2014	SWTS	0.9	0.3	1.5	88.6	92.0	85.4	.	.	.
Madagascar	2013	SWTS	3.3	3.0	3.5	85.3	87.4	83.5	81.6	(76.3)	85.9
Madagascar	2015	SWTS	3.3	3.0	3.5	85.9	88.2	83.9	83.7	84.1	83.5
Madagascar†	2018	MICS	4.5	2.5	5.4	86.4	88.5	85.5	85.5	84.0	85.8
Malawi*	2008	IPUMS	2.8	3.0	2.7	85.3	88.8	82.2	78.5	81.1	75.8
Malawi	2012	SWTS	1.6	1.8	1.4	95.6	97.2	94.2	90.0	(93.7)	(85.6)
Malawi	2014	SWTS	1.2	1.3	1.0	93.0	94.1	92.0	(96.0)	.	.
Mali*	2009	IPUMS	0.6	0.6	0.5	37.7	45.6	30.7	36.2	41.2	31.3
Mali†	2018	DHS	1.1	1.2	0.9	53.8	62.7	47.0	41.9	46.5	
Mozambique	2007	IPUMS	1.9	2.1	1.7	70.2	81.1	61.0	56.2	66.4	45.5
Nigeria†	2018	DHS	0.5	0.5	0.4	75.3	80.7	70.6	57.3	63.2	51.2

COUNTRY	YEAR	SOURCE	% OF PERSONS AGED 15–29 YEARS WITH A DISABILITY			% OF PERSONS AGED 15–29 YEAR WHO EVER ATTENDED SCHOOL, WITHOUT A DISABILITY			% OF PERSONS AGED 15–29 YEAR WHO EVER ATTENDED SCHOOL, WITH A DISABILITY		
			MF	M	F	MF	M	F	MF	M	F
Nigeria†	2018	LSMS	0.6	.	.	81.4	85.4	77.1	55.2	.	.
South Africa†	2016	DHS	2.1	2.5	1.8	99.0	99.0	99.1	91.2	87.6	95.6
South Sudan	2008	IPUMS	3.6	3.6	3.6	34.3	43.2	26.1	35.8	44.9	27.4
Tanzania†	2014	LSMS	1.1	.	1.1	88.1	90.0	86.5	.	.	.
Tanzania†	2016	LSMS	.	.	.	91.9	92.9	90.9	.	.	.
Uganda	2013	SWTS	4.5	5.2	3.8	96.1	97.1	95.2	89.4	(92.8)	(85.3)
Uganda	2015	SWTS	2.3	2.3	2.3	94.1	96.0	92.5	84.5	(83.8)	(85.1)
Uganda	2016	DHS	3.1	3.3	2.9	95.4	96.4	94.4	85.3	87.4	83.2
Zambia	2010	IPUMS	1.5	1.7	1.3	88.9	91.4	86.7	72.4	75.4	68.9
Zambia	2012	SWTS	2.1	2.0	2.1	97.1	98.0	96.3	98.2	(97.7)	(98.6)

Source: ICF 2004–2017; World Bank 2020; UNICEF n.d.; Ruggles et al., 2019; UNESCO, 2018a
All indicators are calculated by UNESCO using source as listed unless otherwise indicated.
† Indicators calculated by authors using source as listed.
Notes: An asterisk (*) identified surveys that did not use The Washington Group questions. A period (.) indicates that values were not reported because they were based on a subsample with fewer than 25 unweighted observations. Numbers in parentheses are based on 25–49 unweighted observations. Averages are unweighted and were calculated from the most recent data for each country. Abbreviations used in the table are as follows: Male (M); Female (F); Male and Female (MF); School-to-Work Transition Survey (SWTS); Demographic and Health Surveys (DHS); Living Standards Measurement Study (LSMS).

Exhibit A-2: Out-of-School Rate for School-age Children, by Disability Status and Sex

COUNTRY	YEAR	SOURCE	% OF PRIMARY OR LOWER SECONDARY SCHOOL AGE CHILDREN WITH A DISABILITY			% OUT OF SCHOOL, PRIMARY OR LOWER SECONDARY SCHOOL AGE CHILDREN WITHOUT A DISABILITY			% OUT OF SCHOOL, PRIMARY OR LOWER SECONDARY SCHOOL AGE CHILDREN WITH A DISABILITY		
			MF	M	F	MF	M	F	MF	M	F
Ethiopia	2015	LSMS	0.7	.	.	36.6	36.3	37.0	71.1	.	.
Madagascar	2018	MICS	12.2	12.4	12.0	15.6	15.8	15.4	19.2	22.1	16.3
Mali	2018	DHS	0.9	0.9	0.8	45.7	43.6	47.9	67.1	67.4	66.7
Nigeria	2018	DHS	0.5	0.5	0.5	32.6	31.6	33.7	47.5	53.7	41.1
Nigeria	2018	LSMS	1	1.2	0.8	36.0	36.1	35.9	63.6	64.8	.
South Africa	2016	DHS	2.5	3.0	1.9	1.8	2.0	1.5	19.2	.	.
Uganda	2016	DHS	3.1	3.1	3.1	16.1	16.2	16.0	32.4	33.8	31.1

Source: ICF 2004–2017; World Bank 2020; UNICEF n.d.

Notes: A period (.) indicates that values were not reported because they were based on a subsample with fewer than 25 unweighted observations. Averages are unweighted and were calculated from the most recent data for each country. Abbreviations used in the table are as follows: Male (M); Female (F); Male and Female (MF); Multiple Indicator Cluster Surveys (MICS); Demographic and Health Surveys (DHS); Living Standards Measurement Study (LSMS).

Exhibit A-3: School Completion Rate for Primary School-Age Children, by Disability Status and Sex

COUNTRY	YEAR	SOURCE	% OF PRIMARY-AGE CHILDREN WITH A DISABILITY			COMPLETION RATE, CHILDREN WITHOUT A DISABILITY (%)			COMPLETION RATE, CHILDREN WITH A DISABILITY (%)		
			MF	M	F	MF	M	F	MF	M	F
Ethiopia†	2015	LSMS	.	.	.	47.5	44.5	51.0	.	.	.
Madagascar†	2018	MICS	14.7	14.9	14.5	64.6	59.9	69.1	61.8	61.2	62.5
Mali†	2018	DHS	1.2	.	.	47.6	52.6	42.5	.	.	.
Nigeria†	2018	DHS	0.4	.	.	69.8	69.8	69.8	.	.	.
Nigeria†	2018	LSMS	.	.	.	73.1	72.0	74.5	.	.	.
South Africa†	2016	DHS	1.8	.	.	97.0	95.4	98.6	80.9	.	.
Tanzania†	2014	LSMS	.	.	.	78.3	73.9	83.3	.	.	.
Tanzania†	2016	LSMS	.	.	.	74.9	74.1	75.6	.	.	.
Uganda	2011	DHS	2.9	3.0	2.9	39.5	36.0	43.1	34.2	(23.2)	(47.7)
Uganda†	2016	DHS	3.3	3.6	3	44.3	42.7	46.0	22.7		

Source : ICF 2004–2017; World Bank 2020; UNICEF n.d.; UNESCO, 2018a
All indicators are calculated by UNESCO using source as listed unless otherwise indicated.
† Indicators calculated by authors using source as listed.
Notes: A period (.) indicates that values were not reported because they were based on a subsample with fewer than 25 unweighted observations. Averages are unweighted and were calculated from the most recent data for each country. Abbreviations used in the table are as follows: Male (M); Female (F); Male and Female (MF); Multiple Indicator Cluster Surveys (MICS); Demographic and Health Surveys (DHS); Living Standards Measurement Study (LSMS).

Exhibit A-4: School Completion Rate for Secondary School-Age Adolescents, by Disability Status and Sex

COUNTRY	YEAR	SOURCE	% OF SECONDARY-AGE ADOLESCENTS WITH A DISABILITY			COMPLETION RATE, ADOLESCENTS WITHOUT A DISABILITY (%)			COMPLETION RATE, ADOLESCENTS WITH A DISABILITY (%)		
			MF	M	F	MF	M	F	MF	M	F
Ethiopia†	2015	LSMS	.	.	.	34.7	32.9	36.7	.	.	.
Madagascar†	2018	MICS	4.3	.	5.3	15.1	15.9	14.8	.	.	.
Mali†	2018	DHS	.	.	.	5.3	8.2	3.4	.	.	.
Nigeria†	2018	DHS	.	.	.	49.5	57.1	43.5	.	.	.
Nigeria†	2018	LSMS	.	.	.	53.8	56.9	50.4	.	.	.
South Africa†	2016	DHS	2.7	3.0	2.3	49.2	45.9	52.2	.	.	.
Uganda	2011	DHS	2.3	2.5	2.2	23.5	25.7	21.8	(10.4)	.	.
Uganda	2016	DHS	2.8	3.1	2.7	17.8	20.3	15.9	.	.	.

Source: ICF 2004–2017; World Bank 2020; UNICEF n.d.; UNESCO, 2018a
All indicators are calculated by UNESCO using source as listed unless otherwise indicated.
† Indicators calculated by authors using source as listed.
Notes: A period (.) indicates that values were not reported because they were based on a subsample with fewer than 25 unweighted observations. Averages are unweighted and were calculated from the most recent data for each country. Abbreviations used in the table are as follows: Male (M); Female (F); Male and Female (MF); Multiple Indicator Cluster Surveys (MICS); Demographic and Health Surveys (DHS); Living Standards Measurement Study (LSMS).

Exhibit A-5: Mean Years of School by Disability Status and Sex

COUNTRY	YEAR	SOURCE	% OF POPULATION AGES 25–29 WITH A DISABILITY			MEAN YEARS OF SCHOOLING, TOTAL POPULATION 25–29			MEAN YEARS OF SCHOOLING, PERSONS 25–29 WITHOUT A DISABILITY			MEAN YEARS OF SCHOOLING, PERSONS 25–29 WITH A DISABILITY		
			MF	M	F	MF	M	F	MF	M	F	MF	M	F
Ethiopia	2015	LSMS	.	.	.	2.1	2.3	1.9	2.1	2.4	1.9	.	.	.
Madagascar	2018	MICS	5.3	3.7	6.0	3.6	3.6	3.6	3.6	3.6	3.6	3.4	3.5	3.4
Mali	2018	DHS	1.1	.	.	1.4	1.5	1.2	1.4	1.5	1.2	.	.	.
Nigeria	2018	DHS	0.5	.	0.5	2.9	3.1	2.7	2.9	3.1	2.7	1.9	.	.
Nigeria	2018	LSMS	.	.	.	2.8	3.0	2.6	2.8	3.0	2.6	.	.	.
South Africa	2016	DHS	2.1	2.4	1.8	3.3	3.3	3.2	3.3	3.3	3.3	2.6	2.6	2.6
Tanzania	2014	LSMS	.	.	.	3.6	3.7	3.6	3.7	3.8	3.6	.	.	.
Tanzania	2016	LSMS	.	.	.	4.0	4.1	3.9	4.1	4.2	4.0	.	.	.
Uganda	2016	DHS	3.3	3.4	3.3	3.0	3.2	2.9	3.1	3.2	3.0	2.4	2.8	2.1

Source: ICF 2004–2017; World Bank 2020; UNICEF n.d.

Notes: A period (.) indicates that values were not reported because they were based on a subsample with fewer than 25 unweighted observations. Averages are unweighted and were calculated from the most recent data for each country. Abbreviations used in the table are as follows: Male (M); Female (F); Male and Female (MF); Multiple Indicator Cluster Surveys (MICS); Demographic and Health Surveys (DHS); Living Standards Measurement Study (LSMS).

Exhibit A-6: Adult Literacy Rate by Disability Status and Sex

COUNTRY	YEAR	SOURCE	% OF POPULATION AGES 15–29 WITH A DISABILITY			LITERACY RATE, TOTAL POPULATION 15–29 (%)			LITERACY RATE, PERSONS 15–29 WITHOUT A DISABILITY (%)			LITERACY RATE, PERSONS 15–29 WITH A DISABILITY (%)		
			MF	M	F	MF	M	F	MF	M	F	MF	M	F
Ethiopia	2015	LSMS	0.8	.	.	76.1	83.0	69.5	76.3	83.2	69.6	.	.	.
Ghana*	2010	IPUMS	2.1	2.1	2.1	83.0	86.5	79.7	74.8	77.7	72.1	83.1	86.7	79.9
Madagascar	2018	MICS	4.5	2.5	5.4	15.6	18.6	14.3	18.6	23.1	16.8	.	.	.
Mali	2018	DHS	0.7	.	0.6	39.7	54.8	34.8	39.7	54.8	34.8	.	.	.
Nigeria	2018	DHS	.	.	0.3	61.3	72.0	58.7	.	.	58.3	.	.	.
Nigeria	2018	LSMS	0.6	.	.	85.7	89.5	81.7	85.8	89.7	81.8	58.3	.	.
Rwanda*	2012	IPUMS	3.1	3.4	2.7	80.9	81.2	80.7	58.7	59.8	57.5	81.6	81.9	81.4
South Africa	2016	DHS	1.7	1.8	1.7	97.1	95.8	97.7	97.2	95.9	97.7	94.3	88.7	96.7
Tanzania*	2012	IPUMS	0.9	1.0	0.8	84.1	86.3	82.3	52.9	53.0	52.7	84.4	86.7	82.5
Tanzania	2014	LSMS	1.1	.	1.1	83.0	84.8	81.5	83.5	85.2	82.0	.	.	.
Tanzania	2016	LSMS	.	.	.	86.2	86.4	86.1	86.7	86.8	86.6	.	.	.
Uganda	2016	DHS	2.5	2.8	2.5	76.4	80.7	75.3	76.7	81.2	75.5	63.9	91.9	64.4
Zambia*	2010	IPUMS	1.5	1.7	1.3	87.3	90.4	84.5	69.0	72.6	64.9	87.5	90.7	84.8

Source: ICF 2004–2017; World Bank 2020; UNICEF n.d.; Ruggles et al., 2019

Notes: An asterisk (*) identified surveys that did not use The Washington Group questions. A period (.) indicates that values were not reported because they were based on a subsample with fewer than 25 unweighted observations. Averages are unweighted and were calculated from the most recent data for each country. Abbreviations used in the table are as follows: Male (M); Female (F); Male and Female (MF); Multiple Indicator Cluster Surveys (MICS); Demographic and Health Surveys (DHS); Living Standards Measurement Study (LSMS).

ANNEX B: SURVEY DATA COMPILATION APPROACH

The Data and Evidence for Education Programs (DEEP) team used international household surveys—DHS, LSMS, and MICS—to estimate seven indicators disaggregated by persons with and without disabilities for 17 countries. Indicators were not estimated in the case of the absence of data for a country. Sampling weights were used for producing nationally representative estimates. All analyses were conducted using Stata 16 SE.

INDICATORS. (1) % of the school-age population; (2) % of school-aged population enrolled in school; (3) Proportion of 15- to 29-year-olds who ever attended school; (4) Out-of-school rate; (5) Completion rate; (6) Mean years of schooling; (7) % of children reading with proficiency; (8) % of children proficient in mathematics; (9) Adult literacy rate.

COUNTRIES. (1) Democratic Republic of the Congo (DRC); (2) Ethiopia; (3) Ghana; (4) Kenya; (5) Liberia; (6) Madagascar; (7) Malawi; (8) Mali; (9) Mozambique; (10) Niger; (11) Nigeria; (12) Rwanda; (13) Senegal; (14) South Africa; (15) Tanzania; (16) Uganda; (17) Zambia.

DATASET SELECTION

Recent studies have been conducted to collate disability data.[6] For this study, the DEEP team analyzed data that could update estimates in the UNESCO Institute for Statistics (UIS) Disability Database released at the end of October 2019 (UNESCO, 2019a). The team focused on disability data that had recently become available from the three largest global household survey programs: the DHS, supported by USAID; the LSMS, supported by the World Bank; and the MICS, supported by UNICEF. The Washington Group on Disability Statistics developed questions for use in household surveys to identify persons with disabilities. The short set (WGSS) includes questions that capture difficulties in six core functional domains—seeing, hearing, walking, cognition, self-care, and communication. The DHS, LSMS, and MICS have all developed disability modules based on the WGSS.

DHS data. At the end of 2016, USAID announced the DHS Program's new optional Disability Module based on The Washington Group disability questions. This new module is part of the DHS Model Questionnaire – Phase 7 (DHS-7). The DHS data for three countries (Mali, Nigeria, and South Africa) included the variable for "highest degree of difficulty for any of the impairments," which had collapsed the values for "a lot of difficulty" and "cannot do at all" to identify those with a disability. The data for one country (Uganda) did not include an overall disability variable, but included eight variables that captured each of the six functional domains and could be used to produce the disability disaggregate.[7]

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[6] For one example, see this July 2018 report funded by UK aid: https://www.disabilitydataportal.com/fileadmin/uploads/lcdp/Documents/report-web_version.pdf

[7] For Uganda, these were "difficulty seeing even with difficulty/contact lenses"; "difficulty seeing (has no glasses/contact lenses)"; "difficulty hearing even with a hearing aid"; "difficulty hearing (has no hearing aid)"; "difficulty communicating"; "difficulty remembering or concentrating"; "difficulty walking or climbing steps"; and "difficulty washing all over or dressing."

LSMS data. The World Bank officially endorsed the WGSS disability questionnaire module to foster data disaggregation by disability status in an internationally comparable way. The WGSS is thus the main reference for the LSMS guidelines.[8]

MICS data. In 2016, UNICEF, in collaboration with The Washington Group, finalized the UNICEF Module on Child Functioning. The module has undergone extensive review by experts and has been tested in several countries to determine the quality of questions.[9] It includes different sets of questions for young children (ages 0–4 years), children (5–17 years) and adults (15–49 years). Although the questions for adults use the WGSS, the questions used for children do not. This new module was implemented in limited countries as part of MICS6.

Of the total 24 household datasets from 18 countries reviewed for this study, 9 included the necessary data for this study. In case datasets for the same country were available for multiple years, only the most recent dataset was analyzed. The table below summarizes the country, household survey, and year for the surveys included in this study.

Exhibit B-1: Summary of Surveys in This Study

COUNTRY	SURVEY	YEAR	WGSS
Ethiopia	LSMS	2015	Yes
Madagascar	MICS6	2018	Yes
Mali	DHS-7	2018	Yes
Nigeria	DHS-7	2018	Yes
Nigeria	LSMS	2018	Yes
South Africa	DHS-7	2016	Yes
Tanzania	LSMS	2014	Yes
Tanzania*	LSMS	2016	Yes
Uganda**	DHS-7	2016	Yes

** The LSMS data for Tanzania 2016 is a nationally representative subsample of 2014. Because the number of respondents with disabilities was small in 2016, data from the larger 2014 sample was also analyzed in this study.*
*** The DHS data for Uganda 2016 used a modified version of the disability module that captured additional information.*

DESCRIPTION OF THE ESTIMATION APPROACH

To estimate each indicator disaggregated by persons with and without disabilities for different age groups, it is necessary to apply a specific methodology for each indicator, for the disability disaggregate, and for the age condition.

DISABILITY DISAGGREGATE

The WGSS includes questions that capture difficulties in six core functional domains: seeing, hearing, walking, cognition, self-care, and communication. The answers follow a four-category scale: no difficulty, some difficulty, a lot of difficulty, cannot do at all. According to The Washington Group standard, a

[8] http://surveys.worldbank.org/disability-0
[9] https://data.unicef.org/topic/child-disability/module-on-child-functioning/

person is considered to have a disability if the answer is "a lot of difficulty" or "cannot do at all" for at least one of the six functional areas.[10]

AGE ADJUSTMENT

As described in UNICEF's *Global Out-of-School Children Initiative Operational Manual*,[11] ages should be adjusted to the children's ages at the start of the school year. The Operational Manual describes two possible adjustments, depending on the availability of the respondent's birthdate. In order to use a consistent approach across datasets that have and do not have birthdate information, in this study the team used the adjustment that does not require birthdate: adjusting the ages back by one year if data for the majority of children were collected more than six months after the school year started. Information about the start of the school year comes from the UIS education system data. The table below summarizes information about whether an age adjustment was needed for the data for each country.

Exhibit B-2: Age Adjustments for Country Data

COUNTRY	SURVEY, YEAR	AGE ADJUSTMENT
Ethiopia	LSMS, 2016	No
Madagascar*	MICS, 2009	Yes
Mali	DHS, 2018	Yes
Nigeria	DHS, 2018	No
Nigeria	LSMS, 2018	No
South Africa	DHS, 2016	Yes
Tanzania**	LSMS, 2014	No
Tanzania	LSMS, 2016	No
Uganda	DHS, 2016	Yes

** The MICS data for Madagascar 2018 included a variable containing the age at the start of the school year.*
*** The LSMS data for Tanzania 2016 is a nationally representative subsample of 2014. Because the number of respondents with disabilities was small in 2016, data from the larger 2014 sample was also analyzed in this study.*

INDICATOR 1: % OF THE SCHOOL-AGE POPULATION

The percentage of the school-age population (as a portion of the country's population) is not among the indicators used to monitor progress toward SDG 4. The entrance age at primary school and the duration of the primary and secondary school levels vary by country. The table below summarizes the age range that qualifies as school-age for each country in this study, based on UIS education system data.

[10] http://www.washingtongroup-disability.com/washington-group-question-sets/short-set-of-disability-questions/
[11] http://uis.unesco.org/sites/default/files/documents/global-out-of-school-initiative-operational-manual-2015-en_0.pdf

Exhibit B-3: School Duration, Entrance Ages, and Expected Age in Final Year of Secondary School

COUNTRY	SURVEY, YEAR	DURATION OF SCHOOL: PRIMARY AND SECONDARY	PRIMARY: ENTRANCE AGE	SECONDARY: EXPECTED AGE IN FINAL YEAR
Ethiopia	LSMS, 2016	12	7	18
Madagascar	MICS, 2009	12	6	17
Mali	DHS, 2018	12	7	18
Nigeria	DHS, 2018	12	6	17
Nigeria	LSMS, 2018	12	6	17
South Africa	DHS, 2016	12	7	18
Tanzania	LSMS, 2016	13	7	19
Tanzania	LSMS, 2016	13	7	19
Uganda	DHS, 2016	13	6	18

INDICATOR 2: PERCENTAGE OF SCHOOL-AGE POPULATION ENROLLED IN SCHOOL

The percentage of the school-age population enrolled in school (as a portion of the country's school-age population) is not among the indicators used to monitor progress toward SDG 4. The age range that qualifies as school-age for each study is the same as for Indicator 1, "% of the school-age population." Because the DHS, LSMS, and MICS are household surveys that capture school attendance in the current school year instead of enrollment, estimates in the study might be lower than comparable estimates produced using enrollment data.

INDICATOR 3: PROPORTION OF 15- TO 29-YEAR-OLDS WHO EVER ATTENDED SCHOOL

The ever-attended school rate is not among the indicators used to monitor progress toward SDG 4.[12] This indicator's helpfulness lies in capturing the percentage of 15- to 29-year-olds who have any formal education, regardless of duration.

Approach using DHS data. For computing the ever-attended rate, the team used the approach described in UNICEF's *Global Out-of-School Operational Manual*, which includes the following variables: "highest educational level attained"; "member attended school during current school year"; "educational level during current school year"; "member attended school during previous school year"; and "educational level during previous school year." In case information about the previous school year was not available in a dataset, the estimation was performed without this adjustment.[13]

Approach using LSMS data. For computing the ever-attended rate, the team used the variable "Have you ever attended school?" combined with "What is the highest grade you completed?" to capture instances of preschool or nonformal education.

Approach using MICS data. Estimates were conducted using the same variables as in the DHS approach.

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[12] http://uis.unesco.org/sites/default/files/documents/ip49-education-disability-2018-en.pdf
[13] http://uis.unesco.org/sites/default/files/documents/global-out-of-school-initiative-operational-manual-2015-en_0.pdf

INDICATOR 4: OUT-OF-SCHOOL RATE

The out-of-school rate of children of primary and lower secondary school age captures the proportion of children who are not attending primary or lower secondary school. These children may have attended school in the past and dropped out, may enter school in the future, or may never go to school.[14] In this study, the out-of-school rate was produced for primary and lower secondary school combined instead of separately, as done by UIS. The table below summarizes the age group for primary and lower secondary for each of this study's countries of interest, based on UIS education system data.

Exhibit B-4: Primary and Lower Secondary Age Groups

		PRIMARY			LOWER SECONDARY		
COUNTRY	SURVEY, YEAR	ENTRANCE AGE	DURATION IN YEARS	AGE RANGE	ENTRANCE AGE	DURATION IN YEAR	AGE RANGE
Ethiopia	LSMS, 2016	7	6	7–12	13	4	13–16
Madagascar	MICS, 2009	6	5	6–10	11	4	11–14
Mali	DHS, 2018	7	6	7–12	13	3	13–15
Nigeria	DHS, 2018	6	6	6–11	12	3	12–14
Nigeria	LSMS, 2018	6	6	6–11	12	3	12–14
South Africa	DHS, 2016	7	7	7–13	14	2	14–15
Tanzania	LSMS, 2016	7	7	7–13	14	4	14–17
Tanzania	LSMS, 2016	7	7	7–13	14	4	14–17
Uganda	DHS, 2016	6	7	6–12	13	4	13–16

Approach using DHS data. For computing the out-of-school rate, the project team used the approach described in UNICEF's *Global Out-of-School Operational Manual*. The team used the following variables: "highest educational level attained"; "member attended school during current school year"; "educational level during current school year"; "grade of education during current school year"; "member attended school during previous school year"; and "educational level during previous school year."

In case information about the previous school year was not available in a dataset, the estimation was performed without this adjustment.

Approach using LSMS data. For computing the out-of-school rate, the project team used the following variables: "Have you ever attended school?" and "Are you currently attending school?" combined with "What is the highest grade you completed?" to capture instances of preschool or nonformal education.

Approach using MICS data. Estimates were conducted using the same variables as in the DHS approach.

[14] http://uis.unesco.org/sites/default/files/documents/estimation-of-the-numbers-and-rates-of-out-of-school-children-and-adolescents-using-administrative-and-household-survey-data-2016-en_0.pdf

INDICATOR 5: COMPLETION RATE

The completion rate is a new indicator developed to monitor progress toward SDG 4.[15] It is the percentage of people 3–5 years older than the intended age for the last grade of each level of education who have completed that grade. The data required are the population in the relevant age group by the highest level of education completed and data on the structure (entrance age and duration) of each level of education, separately for primary education and lower secondary education.[16] In this study, the completion rate was produced for primary and secondary school instead of primary and lower secondary school, as done by the UIS. The table below summarizes this information for each of this study's countries of interest, based on UNESCO Institute for Statistics' education system data.

Exhibit B-5: Completion Rate by Country

		PRIMARY			SECONDARY		
COUNTRY	SURVEY, YEAR	ENTRANCE AGE	DURATION IN YEARS	3–5 YRS ABOVE	ENTRANCE AGE	DURATION IN YEAR	3–5 YRS ABOVE
Ethiopia	LSMS, 2016	7	6	15–17	13	6	21–23
Madagascar	MICS, 2009	6	5	13–15	11	7	20–22
Mali	DHS, 2018	7	6	15–17	13	6	21–23
Nigeria	DHS, 2018	6	6	14–16	12	6	20–22
Nigeria	LSMS, 2018	6	6	14–16	12	6	20–22
South Africa	DHS, 2016	7	7	16–18	14	5	21–23
Tanzania	LSMS, 2016	7	7	16–18	14	6	22–24
Tanzania	LSMS, 2016	6	6	14–16	14	6	22–24
Uganda	DHS, 2016	6	7	15–17	13	6	21–23

Approach using DHS data. For computing the percentage of respondents who have completed primary education in the 3–5 years above the intended age group, the team used the variable "educational attainment," which takes the values "no education," "incomplete primary," "complete primary," "incomplete secondary," "complete secondary," and "higher."

Estimates for completion of the primary level collapsed those with complete primary, incomplete secondary, complete secondary, and higher.[17]

Approach using LSMS data. For computing the completion rate, the team used the following variables: "What is the highest grade you completed?" (with the grades grouped into their appropriate education levels) and "Have you ever attended school?" (to identify those with no education). This information allowed the construction of an "educational attainment" variable with the values "no education," "incomplete primary," "complete primary," "incomplete secondary," "complete secondary," and "higher."

[15] http://uis.unesco.org/sites/default/files/documents/ip49-education-disability-2018-en.pdf
[16] http://uis.unesco.org/node/539583
[17] https://www.disabilitydataportal.com/fileadmin/uploads/lcdp/Documents/report-web_version.pdf

Estimates for completion of the primary level collapsed those with complete primary, incomplete secondary, complete secondary, and higher.

Approach using MICS data. For computing the completion rate, the team combined the variables "What is the highest education level you reached?" and "What is the last grade you attained within this level?" This information allowed the construction of an "educational attainment" variable with the values "no education," "incomplete primary," "complete primary," "incomplete secondary," "complete secondary," and "higher."

Estimates for completion of the primary level collapsed those with complete primary, incomplete secondary, complete secondary, and higher.

INDICATOR 6: MEAN YEARS OF SCHOOLING

Since 2010, the Human Development Report Office of the United Nations Development Programme has been using mean years of schooling (MYS) as a replacement for the adult literacy rate in the calculations of the Human Development Index. UIS has been disseminating MYS estimates since 2013. MYS is the number of completed years of formal education at the primary level or higher, not counting years spent repeating individual grades.

The methodology UIS uses to estimate MYS is based on Barro and Lee (2010), and is the methodology used in this study.[18] This approach combines the percentage of respondents who have completed each education level, adjusting for incomplete primary and secondary education, and the duration of each education level. For this study, the age group of interest was set at 25 to 29 years (UIS instead uses 25 years and older). The table below summarizes the duration of each education level for the countries of interest for this study, based on UIS education system data.

Exhibit B-6: Education Duration, by Level and Country

COUNTRY	SURVEY, YEAR	PRIMARY: DURATION IN YEARS	SECONDARY: DURATION IN YEARS	TERTIARY SCHOOL: DURATION IN YEARS
Ethiopia	LSMS, 2016	6	6	4
Madagascar	MICS, 2009	5	7	4
Mali	DHS, 2018	6	6	4
Nigeria	DHS, 2018	6	6	4
Nigeria	LSMS, 2018	6	6	4
South Africa	DHS, 2016	7	5	4
Tanzania	LSMS, 2016	7	6	4
Tanzania	LSMS, 2016	7	6	4
Uganda	DHS, 2016	7	6	4

[18] http://uis.unesco.org/sites/default/files/documents/uis-methodology-for-estimation-of-mean-years-of-schooling-2013-en_0.pdf

Approach using DHS data. For computing the MYS, the team used the following variable: hv109, "educational attainment," with the values "no education," "incomplete primary," "complete primary," "incomplete secondary," "complete secondary," and "higher."

Approach using LSMS data. For computing the MYS, the team used the following variables: "What is the highest grade you completed?" (with the grades being grouped into their appropriate education levels) and "Have you ever attended school?" (to identify those with no education). This information allowed for the construction of an "educational attainment" variable with the values "no education," "incomplete primary," "complete primary," "incomplete secondary," "complete secondary," and "higher."

Approach using MICS data. For computing the MYS, the team combined the variable: "What is the highest education level you reached?" and "What is the last grade you attained within this level?" This information allowed for the construction of an "educational attainment" variable with the values "no education," "incomplete primary," "complete primary," "incomplete secondary," "complete secondary," and "higher."

INDICATOR 7: % OF CHILDREN READING WITH PROFICIENCY

This study is interested in the percentage of children aged 7–17 years who have achieved proficiency in reading, compared with the country's 7- to 17-year-old population. However, children's reading proficiency was not collected consistently across the data analyzed for this study, so this indicator was not estimated.

INDICATOR 8: % OF CHILDREN PROFICIENT IN MATHEMATICS

This study is interested in the percentage of children aged 7–17 years who have achieved proficiency in mathematics, compared with the country's 7- to 17-year-old population. However, children's proficiency in mathematics was not collected in the data analyzed for this study, so this indicator was not estimated.

INDICATOR 9: ADULT LITERACY RATE

The adult literacy rate typically estimates the ability of youth and adults to read and write, with understanding, a short, simple statement about everyday life. In accordance with UIS guidance, "literate" was defined as those who had attended schooling higher than the secondary level or those who could read part of or a whole sentence. Youth is often defined as those in the 15- to 24-year age group, and adults are often defined as either those in the 15- to 49-year age group or those aged 15 years and older.[19,20] For this study, the age group of interest was set at 15–29 years, so the rates were determined based on the population of those in this age group.

Approach using DHS data. For computing the adult literacy rate, the team appended the men's data (mr) and individual women's data (ir). The following variables were used: "highest educational level (women)"; "highest educational level (men)"; "literacy (women)" and; "literacy (men)." Values for "literacy" included "cannot read at all," "able to read only parts of sentence," and "able to read whole sentence." Those who could read parts of or a whole sentence were recorded as literate. These data were merged with the household data (pr) to access the disability disaggregate variable.

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[19] http://uis.unesco.org/sites/default/files/documents/metadata-global-thematic-indicators-sdg4-education2030-2017-en_1.pdf
[20] https://dhsprogram.com/data/Guide-to-DHS-Statistics/Literacy.htm

Approach using LSMS data. For computing the adult literacy rate, the team used the following variables: "Can you read and write?" (which took the values of "yes" or "no"); and "What is the highest grade you completed?" (which identified those that attended higher education).

Approach using MICS data. For computing the adult literacy rate, the team appended the men's data (mn) and women's data (wm). The following variables were used: "highest educational level (women)"; "highest educational level (men)"; "literacy (women)"; and "literacy (men)." Values for "literacy" included "cannot read at all," "able to read only parts of a sentence," and "able to read whole sentence." Those who could read parts of or a whole sentence were recorded as literate.