# ARE CHILDREN REALLY LEARNING?

**Exploring foundational skills in the midst of a learning crisis**

# Acknowledgements

**GPE KIX**
KNOWLEDGE INNOVATION EXCHANGE

# Contents

# Foreword

With each passing day, the devastating impact of the COVID-19 pandemic on children's learning becomes more apparent. Widespread school closures and other barriers have amplified and compounded a pre-existing global learning crisis that already threatened the futures of millions of children around the world.

As this report shows, even before the pandemic hit, the majority of children in countries analyzed had not mastered foundational skills in either reading or numeracy by the time they reached Grade 3. Only 30 per cent of these children had foundational reading skills – and just 18 per cent had foundational numeracy skills.

Among many countries analyzed in sub-Saharan Africa, *fewer than one in 10 children* were found to have foundational learning skills.

And even before the pandemic, the data reveal that one quarter of Grade 8 students in countries analyzed did not have the skills to understand even Grade 2 textbooks.

The pandemic's impact on education has also widened disparities and deepened inequity. Children from the poorest households, those involved in child labour, children with disabilities, and other marginalized groups are falling even further behind their peers in their learning.

The harsh reality is that many of these children will drop out of school altogether, never to acquire the basic reading and numeracy skills that are the crucial foundation for all future learning, skills development, and ultimately the transition to work.

In other words, instead of being the great equalizer, education is at risk of becoming the great divider.

We cannot keep failing an entire generation of students. Only urgent action and investment by governments and other partners can stem the tide of learning loss.

It is not enough simply to reopen schools. We need a concerted global effort to make education a top priority in COVID-19 recovery planning.

To tackle the global learning crisis head on, we are calling on governments to make urgent investments in education, focused on four priorities:

● Account for every child and bring them all back into the classroom;

● Assess every child to measure their learning;

● Accelerate every child's learning by providing support to catch up and make progress in the classroom, and

● Assure the wellbeing and protection of children, recognizing that their learning depends on children being safe and well-nourished.

Every child has the right to reach their full potential. We cannot sit back and allow a generation of children to miss out on their learning. We must act now.

Catherine Russell
UNICEF Executive Director

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# Abbreviations

| | |
|---|---|
| **ANAR** | Adjusted Net Attendance Rate |
| **FLN** | Foundational Literacy and Numeracy |
| **MICS** | Multiple Indicator Cluster Surveys |
| **MICS6** | Multiple Indicator Cluster Surveys Round 6 |
| **MICS-EAGLE** | Multiple Indicator Cluster Surveys – Education Analysis for Global Learning and Equity |
| **NEET** | Not in employment, education or training |
| **OOSC** | Out-of-school children |
| **RISE** | Research on Improving Systems of Education |
| **STEM** | Science, Technology, Engineering, and Math |
| **UNESCO** | United Nations Educational, Scientific and Cultural Organization |
| **UNICEF** | United Nations Children's Fund |

Fatimata Sumani pointing out words on a chalkboard at the Tong District Assembly Primary School near Karaga in the Northern Region of Ghana. As there is no classroom for the kindergarten students, they sit at tables under trees in the schoolyard.

# Executive Summary

The COVID-19 pandemic came at a time when the world was already grappling with a serious learning crisis in which many children were not mastering the fundamentals of reading and numeracy even if attending school. With widespread school closures and other disruptions to the education system brought about by the pandemic, the learning crisis has escalated to new heights. While the number of out-of-school children had already started to climb for the first time in 20 years in 2020, by all accounts the increase has begun accelerating. Children have to get back to the classroom, but changes are needed to ensure that they really learn, starting with the foundational basics of reading and numeracy. Improvements in teacher training, greater investment in teaching resources, and a focus on foundational skills will help turn the tide and set children on a path to educational growth and discovery.

This report offers unique insight into the extent of the learning crisis by providing an in-depth picture of which children are most at risk of not acquiring foundational learning skills. The analysis of 32 low- and middle-income countries and territories uses newly released data from surveys undertaken in 2017-2021 as part of Round 6 of the Multiple Indicator Cluster Surveys (MICS6) to examine the equity perspectives of the crisis, exploring learning outcomes among different subgroups of children, with a focus on the most vulnerable. Simulations are also carried out to preview the extent to which learning loss has occurred as a result of the pandemic, as well as determine the impact of different strategies to overcome these losses. Finally, the report examines timely concerns of remote learning readiness in the event of school closures and draws links between this pressing matter and learning outcomes.

**The MICS6 data confirm that the learning crisis is real for most children. While the most vulnerable, including children from poor households, children with a less supportive home environment, children with functional difficulties, and children involved in child labour have the lowest level of foundational learning skills, in most countries it is the majority of children who are far from achieving foundational learning goals.**

Children are expected to have acquired foundational reading and numeracy skills at the end of Grade 2. This includes being able to read and interpret a simple passage and identify and distinguish between different numbers. But in most countries analyzed, the majority of children have not mastered foundational skills in either reading or numeracy by the time they reach Grade 3. In more than half the countries, only 30 per cent of children have foundational reading skills and a mere 18 per cent have foundational numeracy skills. Among many countries in sub-Saharan Africa, fewer than one in 10 children have foundational learning skills on time.

Learning outcomes can vary based on factors such as sex, urban-rural location, household wealth, disability (functional difficulty status), child labour status, language of instruction, parental involvement in their children's education, and the home environment. The findings indicate that **wealth** is the strongest predictor, as children in the poorest quintile have 16 percentage point lower likelihood of having foundational reading skills than children from the wealthiest quintile. Moreover, analysis of differences by parental involvement show that children whose parents do not attend meetings at the school or help them with their homework have a lower probability of having foundational learning skills, as do children who have no child-oriented books at home, or their mothers have less than a primary education.

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Children with **functional difficulties (disabilities),** whether they be of a physical, behavioural, or emotional nature, can be at further disadvantage when it comes to learning. The good news is that children with functional difficulties have similar primary school attendance rates as those without those difficulties. The less encouraging news is that they may not be learning as much as their peers. Students with a functional difficulty in the domains of communicating, learning, remembering, hearing, concentrating, walking, controlling behaviour, making friends, and anxiety are less likely to have foundational reading skills than students without those difficulties. Among these domains, the difference is largest for children with communication difficulty, at 23 percentage points.

When children are forced to work, they can be denied the opportunity to learn. In comparing the educational outcomes of children from the poorest 40 per cent of households who are

engaged in **child labour** and are not attending school, with children from similar households who do attend school and are not involved in child labour, the differences are clear-cut. When children go to school rather than work, their chances of having foundational reading skills are at least double in most countries. Keeping children in school is so important, as the learning gap between children in and out of child labour tends widens as children get older.

While school is the best place for children, it is also essential to have high quality instruction, otherwise the **pace of learning** can be too slow. Children do learn more the longer they stay in school. By Grade 8, in all but three countries, at least half (and in many cases three-fourths or more) of children have acquired foundational reading skills. But many children still don't have foundational numeracy skills even by Grade 8. This speaks to the slow pace of learning in many countries, which can be tied

to the low quality of education. In the average country analyzed, it would take 7 years of primary schooling for 70 per cent of children to acquire foundational reading skills. To reach this benchmark for numeracy it would take 11 years of primary school. Concerted efforts are therefore needed to address the learning crisis, which include systemic approaches to improve learning for all children.

The massive disruptions to the education system brought about by the COVID-19 pandemic, as well as the recent increase in out-of-school children, mean that children are sure to suffer substantial learning loss, but with the right strategies, these losses can be recouped over time.

While the world awaits the real-time data recounting the impact of the pandemic on learning outcomes, simulations and other analyses can offer an illuminating preview. We examine differences in foundational reading skills between children **in school and those who dropped out** in the previous year. This offers a proxy of the impact of a year of school closures on learning outcomes.

Data for 12 countries show that on average (and holding everything else constant), the share of children who have foundational reading skills would drop by 68 per cent after missing out on school for a year. Given that only 30 per cent of children had foundational reading skills before the pandemic, this fall for children who drop out of school (which represents children who had their schools closed for a year) could mean that only about 10 per cent would have foundational reading skills a year later.

Further analysis of the situation for out-of-school children is especially pertinent

considering that the number of out-of-school children is on the rise for the first time in 20 years, spurred by the pandemic. Although the rate of learning among children attending school may be low, it is far lower for children who are out of school. For children aged 8 to 14, the difference in foundational learning skills by school attendance is stark. For reading, 46 per cent of children who are in school have these skills, compared to just 12 per cent among children who are out-of-school. For numeracy, the difference is 27 per cent for in school compared to 12 per cent for out-of-school. The underlying message is clear: children need to be in school to learn. Schools that are closed need to reopen, and stay open, so that children can continue their learning journeys.

Although all children suffer the consequences of school closures, it is the **younger children** who stand to lose the most, with losses accumulating over time. Simulations reveal that a year's worth of learning loss during school closures could amass to a 27

percentage point reduction in the share of today's Grade 1 children demonstrating foundational reading skills by Grade 9, dropping from 78 per cent to 51 per cent. By contrast, the potential long-term lossess for today's Grade 6 cohort are much smaller: 7 percentage points from a year's learning loss. With effective mitigation strategies, including teaching at the right level, supported by long-term system reorientation, there could be large potential gains in recouped learning loss. Following these strategies, eventual Grade 9 foundational reading skills could rise to 75 per cent for today's Grade 1 children, nearly to where it would be had there been no school closures. The key, however, is ensuring that the system reorientation continues over the long term. There is no quick fix.

> Beyond the pandemic, the world is confronting other challenges, such as the rapid pace of technological change which is bringing a move towards more digitized forms of learning, which holds consequences for children's learning.

The **digital divide** can be seen across education, with the evidence becoming more visible during the pandemic as school closures forced a shift to distance learning. Having access to the internet at home has become even more important so that children can continue learning when they are unable to go to school. But it is primarily children aged 7-14 from the lowest income countries, most notably in sub-Saharan Africa, who have the lowest rate of internet access at home. Correspondingly, these are also the children with the lowest rates of foundational reading skills. To help bring about greater equity in learning, as well as aid in learning recovery, the internet needs to be accessible to everyone.

In conclusion, the threats to children's education are manifold and require a concerted and coordinated effort on the part of governments and other key stakeholders. For its part, UNICEF, in conjunction with its partners across the globe, is doing its utmost to improve learning outcomes for children, both throughout the pandemic and beyond. With the help of three key initiatives: **Mission Recovery,** which prioritizes bringing children back to school, implementing catch-up learning, and preparing and supporting teachers, along with **Reimagine Education,** which promotes digital learning as part of essential services for every child, and **Foundational Literacy and Numeracy** (FLN), which produced the FLN Hub, a repository of practical resources to strengthen foundational literacy and numeracy interventions, children may have the opportunity to learn, thrive, and reach their potential.

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Байгалийн ...ендар

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Children play and learn at an early childhood development center, supported by UNICEF, in Ulaanbaatar, Mongolia. UNICEF Early Childhood Development programme improves the quality of education, by investing in training for teachers and providing toys and learning materials.

# Introduction

## Putting the report in context

By all accounts, the COVID-19 pandemic is taking an exacting toll on children, as is evidenced by an increase in child poverty, child hunger, child labour, forced early marriage, and out-of-school rates.[1] Perhaps nowhere have the effects of the pandemic been felt more profoundly for children than in education, at a time when the world was already grappling with a serious learning crisis. School closures and other disruptions to the education system have compounded the existing learning crisis, raising even greater levels of alarm. Even as the pandemic enters its third year, 405 million schoolchildren in 23 countries continue to be affected by full or partial school closures.

For years, school enrolment rates have been on the rise, with the global adjusted net attendance rate for primary school reaching 87 per cent in 2019.[2] Recently, however, out-of-school rates have begun to climb, with the total number of out-of-school children (OOSC) from primary to upper secondary increasing by 5.9 million from 2018 to 2020.[3] It's the first time that the decreasing trend of the total number of OOSC is reversed as far as we can observe from the historical data.

Data emerging from several countries indicate that pandemic-related hardships and shuttered schools have led to a worsening of the situation for OOSC. For example, in South Africa, the number of OOSC tripled from 250,000 to 750,000 between March 2020 and July 2021, and in Malawi, dropout rates among girls in secondary education increased by 48 per cent, from 6.4 per cent to 9.5 per cent between 2020 and 2021.[4] Further evidence also points to substantial numbers of children not returning to school following reopening: in Liberia, 43 per cent of students reportedly did not return to the classroom when schools reopened; in Uganda about one in 10 students at the primary and secondary levels did not report back to school at reopening;[5] and in Kenya, a survey of 4,000 adolescents aged 10-19 years found that 16 per cent of girls and 8 per cent of boys did not return when schools reopened.[6]

Even before the onset of the COVID-19 pandemic, there were serious questions about whether children, even if they were in school, were actually learning. The World Bank coined the term "learning poverty" to describe the inability of a child to read and understand a simple text by age 10. Prior to the pandemic, 53 per cent of children from low- and middle-income countries could not read proficiently by the end of primary school, with the level as high as 80 per cent in the poorest countries.[7] Due to the major disruptions to the education system brought on by the pandemic, including prolonged school closures and an increase in out-of-school children, simulations show that learning poverty will likely rise, encompassing as much as 70 per cent of primary school age children in low- and middle income countries.[8]

The pandemic also holds consequences for achievement of the Sustainable Development Goals (SDGs) by 2030, including SDG4, ensuring equitable and quality education for all. One of the education targets is for all girls and boys to complete primary and secondary education that leads to relevant and effective learning outcomes (SDG4.1). The target, therefore, is to ensure that children not only attend school, but that they learn effectively as well. An indicator that is used to measure progress towards reaching this target is the proportion of children in Grades 2/3 achieving at least a minimum proficiency level in reading and mathematics. The evidence so far, however, indicates that this objective of children reaching effective learning outcomes by 2030 is not within reach.[9]

1. https://www.unicef.org/press-releases/covid-19-biggest-global-crisis-children-our-75-year-history-unicef
2. https://data.unicef.org/topic/education/primary-education/
3. UNESCO Institute for Statistics (UIS) database, http://data.uis.unesco.org
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5. Uganda National Examinations Board, Effects of COVID-19 Pandemic on Teaching and Learning at Primary and Secondary Education Levels in Uganda – 2021 Report National Assessment of Progress in Education, Uganda National Examinations Board, Kampala, 2021. https://www.mediacentre.go.ug/sites/default/files/media/REPORT%202ND%20REVIEWED%20FOR%20DISSEMINATION%202021.pdf
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7. World Bank, Learning Poverty, Brief, 10/15/19, https://www.worldbank.org/en/topic/education/brief/learning-poverty
8. Azevedo, Joao Pedro Wagner De; Rogers, F. Halsey; Ahlgren, Sanna Ellinore; Cloutier, Marie-Helene; Chakroun, Borhene; Chang, Gwang-Chol; Mizunoya, Suguru; Reuge, Nicolas Jean; Brossard, Matt; Bergmann, Jessica Lynn. *The State of the Global Education Crisis: A Path to Recovery (English)*. Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/416991638768297704/The-State-of-the-Global-Education-Crisis-A-Path-to-Recovery
9. https://www.sdg4education2030.org/sites/default/files/2020-03/2019-11%20SC%20HED%20Statement%20EN.pdf

**FIGURE 1.** Sustainable Development Goal 4
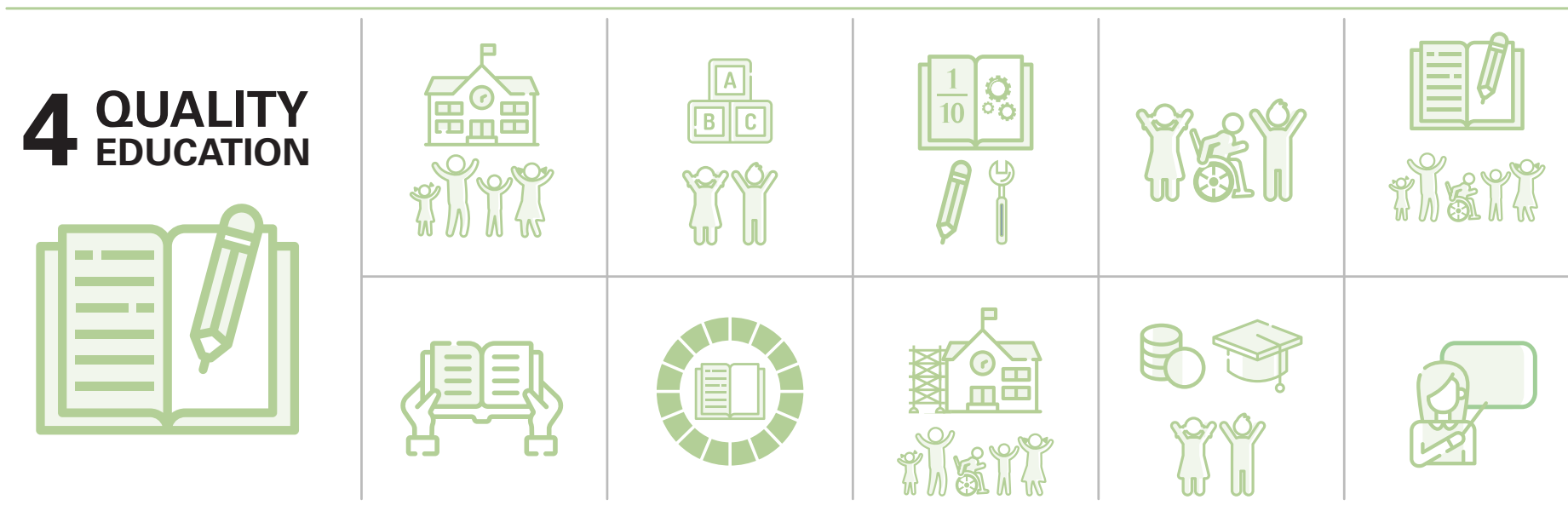
**Source:** Social innovations and inclusion of Sustainable Development Goals

A concerted effort is needed to address the learning crisis, and set the world on a trajectory towards achieving SDG4. To this end, UNICEF advocates an approach that focuses on enhanced learning, in a way that promotes equity and inclusion to ensure that every child learns.[10] Integral to this approach is a reliance on data-driven policymaking, where data are used to inform education policies and practices. Such is at the heart of the project known as MICS-EAGLE, for its use of Multiple Indicator Cluster Survey (MICS) data to advance Education Analysis and Global Learning and Equity (EAGLE). MICS-EAGLE aims to help countries make better use of their education data, directing it towards evidence-based policymaking and advocacy so that all children will realize their right to learn.

The MICS-EAGLE project also fosters connections with UNICEF initiatives to "reimagine education" in response to pressing challenges. The COVID-19 pandemic, and the resultant school closures have created an urgent need to reimagine education in a way that takes into consideration digital learning as part of essential services for every child. UNICEF believes that every child and young person – some

3.5 billion by 2030 – should be connected to world-class digital solutions that offer personalized learning to improve their chances for a brighter future. Remote learning, which may include digital learning, can also be an important part of a reimagined education, as it provides various ways to mitigate the learning losses children can experience during school closures brought about by crises, including those climate-related, by providing an array of remedial programmes.

The current report is in line with global efforts to address the learning crisis as it brings to light key data on foundational learning outcomes, with particular attention given to equity. The overall objective of this report is to generate new data and information on foundational learning outcomes among diverse groups of children, including out-of-school children, children with functional difficulties, and children engaged in child labour. Findings from the report can be used to improve education policies and practices at the country level, as well as assess progress on attainment of SDG4.1[11], all with a view towards achieving better education outcomes for children.

10. https://www.unicef.org/education
11. Please see 5-Year Progress Review of SDG4 – Education 2030 in Asia-Pacific for a comprehensive review of progress made towards the achievement of SDG4 in the Asia-Pacific region.

**Belarussian pre-school children are participating in group activity at the kindergarten. Teacher is using child-centred approach. The photo was made during the field visit to document the best practices of pre-school education in Belarus.**

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# Data and analytical approach

The primary source of data for this report is the sixth-round of the Multiple Indicator Cluster Surveys (MICS6), covering survey years 2017-2021. MICS is the largest compendium of statistically sound and internationally comparable data from household surveys on children and women worldwide. Data are gathered through face-to-face interviews carried out in households on a variety of topics, including education. The foundational learning skills data are collected through a series of reading and numeracy exercises performed by one child in the household aged 7 to 14[12], which are designed to assess minimum proficiency for a child having completed Grade 2. Children may either be in school or out of school, which allows for an analysis of foundational learning skills by school attendance status. For children who are in school, they may be in any grade, typically from Grade 1 through Grade 8.

## Box 1. Advantage to using household data to assess learning outcomes

Learning assessments are often school-based, where students take the assessment in the classroom. The disadvantage to this approach is that it does not capture children who are not in school. Household surveys, however, are conducted in the home and can cover a broader population. In the case of MICS6, the learning assessment is carried out on a child aged 7 to 14 in the household, who may be in school or out of school. This provides a more comprehensive picture of learning outcomes for all children, particularly in countries where there is a high out-of-school population. In addition, since the household survey collects data on a variety of topics, it is possible to link learning data with other child and family characteristics such as child labour, functional difficulty, household wealth, language, and ethnicity.

12. Children are randomly selected to take part in the assessment to avoid the occurrence of selection bias.

To assess whether a child has foundational reading skills, they are asked to perform three tasks (see Figure 2). The child is presented with a simple text and asked to read it aloud, after which they are asked five questions related to the text to assess whether they can interpret and infer information therein.[13] If a child succeeds in reading 90 per cent of the words in the text correctly, and can answer the three literal and two inferential questions related to the text, then they are considered to have foundational reading skills.[14]

**FIGURE 2.** Three areas to assess foundational reading skills



**Source:** UNICEF (2020), MICS-EAGLE Data Analysis Manual

Foundational numeracy skills are assessed by asking the child to perform four numeric tasks (see *Figure 3*). If the child can successfully perform all four tasks: recognize and read numbers aloud, discriminate between which of two numbers is larger, perform simple addition, and recognize patterns of numbers in a sequence, they are considered to have foundational numeracy skills.

**FIGURE 3.** Four areas to assess foundational numeracy skills
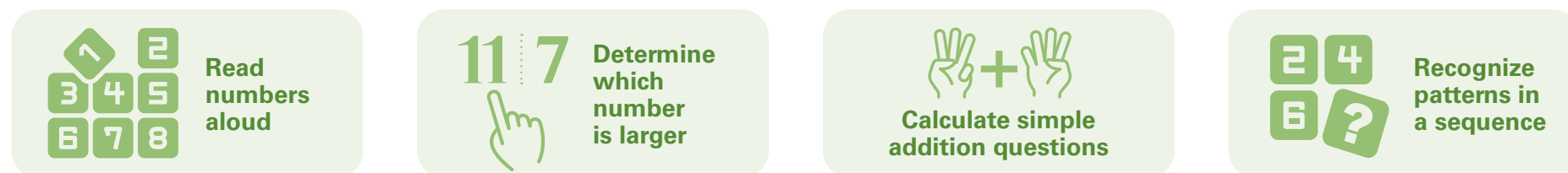


**Source:** UNICEF (2020), MICS-EAGLE Data Analysis Manual

Please see Annex 6 for examples of sample texts and the types of questions asked in the reading and numeracy assessment.

The indicator value from the foundational learning module is calculated using a simple binary, where children are said to either have the foundation reading or numeracy skill, or they do not. There is no scale to measure the degree of skill.

The report will present the overall status of foundational learning outcomes among children to give a broad picture, and will also go more in-depth by showing disaggregated data by various factors such as age, sex, location, child labour status, functional difficulty status, language, and wealth index quintile[15] to better understand their impact on learning. In addition, this report will shed light on foundational learning issues in the context of the COVID-19 pandemic. This approach will highlight the connection between children acquiring foundational learning skills and the risks to them falling behind due to a lack of access to the internet, particularly in the event of school closures. In addition, a simulation of the impact of lost learning, as well as the impact of mitigation measures, will be provided.

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13. Pronunciation, accent, and fluency are not measured, only reading accuracy and comprehension.
14. For a detailed description of the psychometric properties of the foundational learning module, please see https://mics.unicef.org files?job=W1siZiIsIjIwMTkvMDUvMDcvMTQvNDMvMzgvODQ0L01JQ1NfTWV0aG9kb2xvZ2lYWxfUGFwZXJfOS5wZGYiXV0&sha=1251233507af5fe2
15. Wealth index is a composite indicator represented on a continuous scale and calculated in MICS based on household possessions. It is then divided into 5 equally sized groups, each representing 20 per cent of the distribution, ranging from bottom to top.

## Countries included

The coverage of countries included in the analysis is based on availability of microdata. Thirty-two countries and territories are analyzed in this report, including Bangladesh, Belarus, the Central African Republic, Chad, the Democratic Republic of the Congo, the Gambia, Ghana, Guinea-Bissau, Guyana, Kiribati, Kosovo,[16] Kyrgyzstan, Lesotho, Madagascar, Mongolia, Nepal, North Macedonia, Pakistan – Punjab, Pakistan – Sindh, Samoa, Sao Tome and Principe, Sierra Leone, the State of Palestine, Suriname, Thailand, Togo, Tonga, Tunisia, Turkmenistan, Turks and Caicos Islands, Tuvalu, and Zimbabwe.

16. All references to Kosovo in this report should be understood to be in the context of United Nations Security Council Resolution 1244 (1999).

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"The way out of the climate and ecological crisis is collective. Hope is in the movement that we know how to build". Hi! I'm Nicole Becker, I am 19 years old, I am a militant environmental activist, Champion of Escazu Agreement and one of the founders of Youth for Climate Argentina, an environmental social group.

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# Findings

## Overview

To determine the extent to which schoolchildren are learning in line with the expected learning outcomes for their grade, the share of children attending Grade 3 with foundational learning skills have been analyzed. As the foundational learning data is pegged to assess reading and numeracy skills at Grade 2, children who have completed Grade 2 and are currently attending Grade 3 can be expected to have acquired these foundational skills. The findings reveal, however, that in most of the countries analyzed, the majority of students in Grade 3 have not mastered

foundational skills in either reading or numeracy. Among the 31 countries and territories included in the analysis, the median value for the share of children with foundational reading skills is 30 per cent, ranging from a low of 3 per cent in the Central African Republic to a high of 82 per cent in Belarus. For foundational numeracy skills, the median value of children with foundational learning skills is 18 per cent, ranging from less than 1 per cent in the Democratic Republic of the Congo, to a high of 71 per cent in Belarus.

**FIGURE 4.** Share of children attending Grade 3 with foundational reading skills
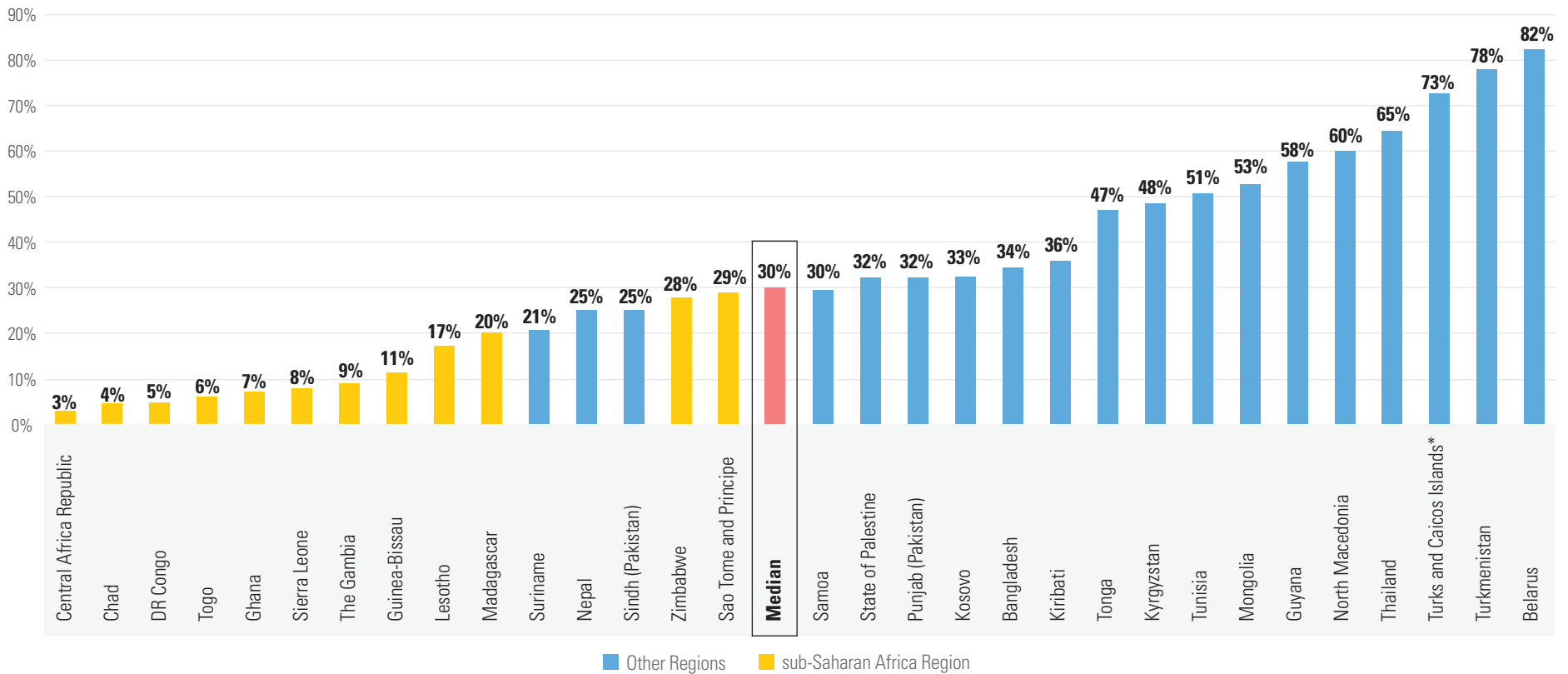


**Source:** Multiple Indicator Cluster Surveys Round 6 (2017-2021)
*Sample size is between 25 and 50 observations. Note: countries with observations below 25 have been dropped.

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**FIGURE 5.** Share of children attending Grade 3 with foundational numeracy skills
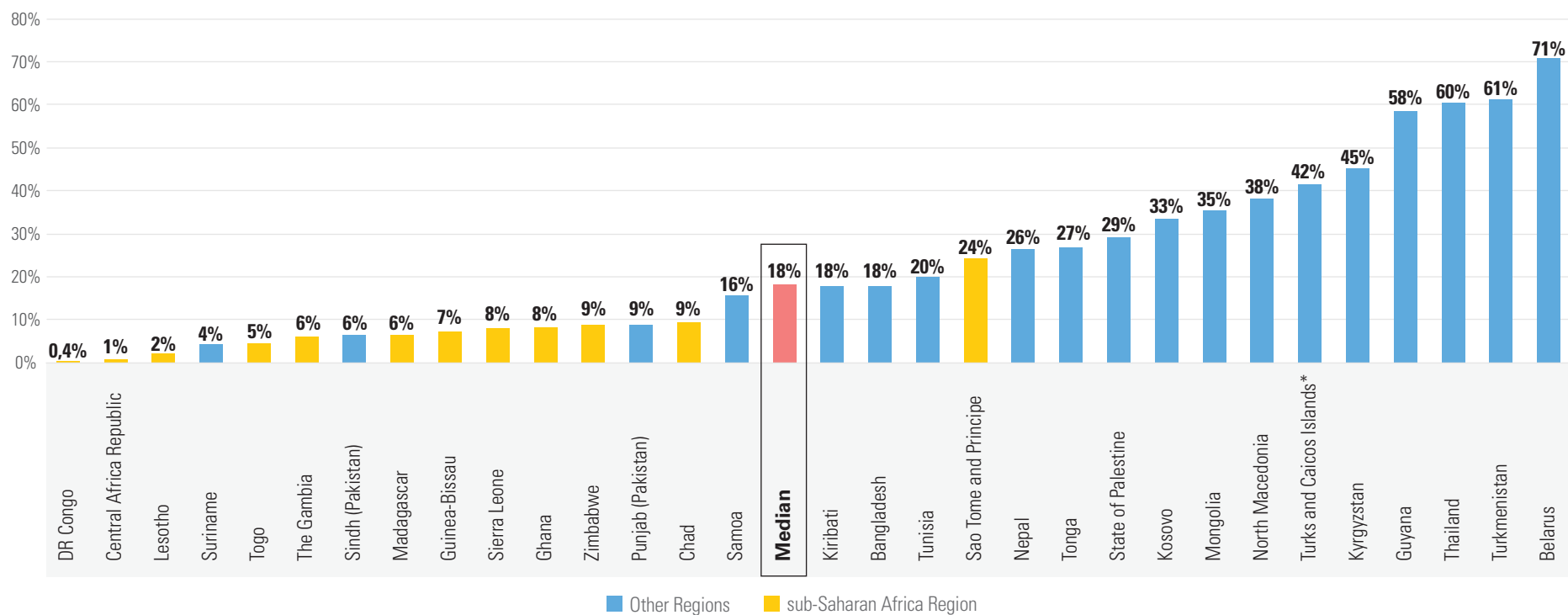


**Source:** Multiple Indicator Cluster Surveys Round 6 (2017-2021)
*Sample size is between 25 and 50 observations. Note: countries with observations below 25 have been dropped.

Wide variations are evident across the countries for which data are available. Countries in sub-Saharan Africa have the lowest share of children with foundational reading and numeracy skills, and countries in Eastern Europe, Latin America and the Caribbean, and Asia have the highest. It is particularly worrisome that in all 12 of the sub-Saharan African countries analyzed, fewer than 30 per cent of schoolchildren attending Grade 3 have the reading skills that are targeted for that grade, and for 11 of these countries, fewer than 10 per cent of schoolchildren have the numeracy skills expected upon the completion of the 2nd grade. The regional disparities can be attributed, at least in part, to a country's income grouping.

Low-income countries (particularly those in sub-Saharan Africa) tend to have the lowest share of children with foundational learning skills, and middle-income countries (particularly those in Latin America and the Caribbean, Eastern Europe and Central Asia) have a higher share. Subsequent analysis of foundational learning by wealth quintile (discussed below) also points to the relationship between family socioeconomic status and learning.

These findings provide an important snapshot of where countries stand with regards to progress towards achieving SDG4.1 on relevant and effective learning outcomes. As mentioned above, an indicator for

measuring progress is the proportion of children who have completed Grade 2 achieving at least a minimum proficiency level in reading and mathematics. Yet in 23 of the 31 countries and territories for which data are available, fewer than half of children have foundational reading skills at the time they are attending Grade 3. The situation is even more dire with respect to foundational numeracy, as in 27 of the 31 countries and territories with available data, fewer than half of children who are attending Grade 3 have mastered these skills. Most countries, therefore, have a long way to go before achieving the goal of effective learning outcomes set out in SDG4.1.

**Young boys and girls attend their class in UNICEF supported Accelerated Education program (AEP) center, Rehmat Colony, Rahim Yar Khan district, Punjab province, Pakistan.**
© UNICEF/UN0307998/Zaidi

# Out-of-school children

Although the indicator of progress towards achieving SDG4.1 is geared towards children who are currently attending school, the fact remains that many children who should be in school are not, for one reason or another. Therefore, the above overview of the share of children with foundational learning skills is actually an overestimation of the true situation for children because it does not take into consideration those children who are not in school. In some countries, the percentage of out-of-school children is particularly alarming, most notably in Chad, where half of all children aged 8-14 are out-of-school, and in the Pakistan province of Sindh where 42 per cent of children are not attending school.

It may not come as a surprise to see that children who are out of school are not learning as much as their peers who are attending school. In virtually all the countries analyzed, a smaller share of out-of-school children have either foundational reading or numeracy skills than their in-school counterparts. In fact, the difference in the median share of children with foundational learning skills by school attendance is stark: for reading it is 46 per cent for in school versus 12 per cent for out-of-school, and for numeracy the difference is 27 per cent for in school versus 12 per cent for out of school. Even more striking, the data reveal that in five African countries – the Central African Republic, Chad, Guinea-Bissau, Sao Tome and Principe, and Sierra Leone – the children who are out of school do not have any foundational reading skills. To put this in further context, in all but Sao Tome and Principe, at least one in seven children in these countries are out-of-school. Not enough children in these countries are in school, and being out-of-school can severely limit their chance to learn. Therefore, efforts to improve foundational learning skills must be addressed towards all children, with particular consideration given to the most vulnerable who are not in school and are denied the opportunity to learn.

A portrait of Mohammad Rashed (11) who received Structural Psychosocial Support (PSS) at Multipurpose Center, implemented by Good Neighbors and funded by UNICEF.

© UNICEF/UN0581204/Sujan

**FIGURE 6.** Percentage of children aged 8-14 with foundational reading skills by school attendance
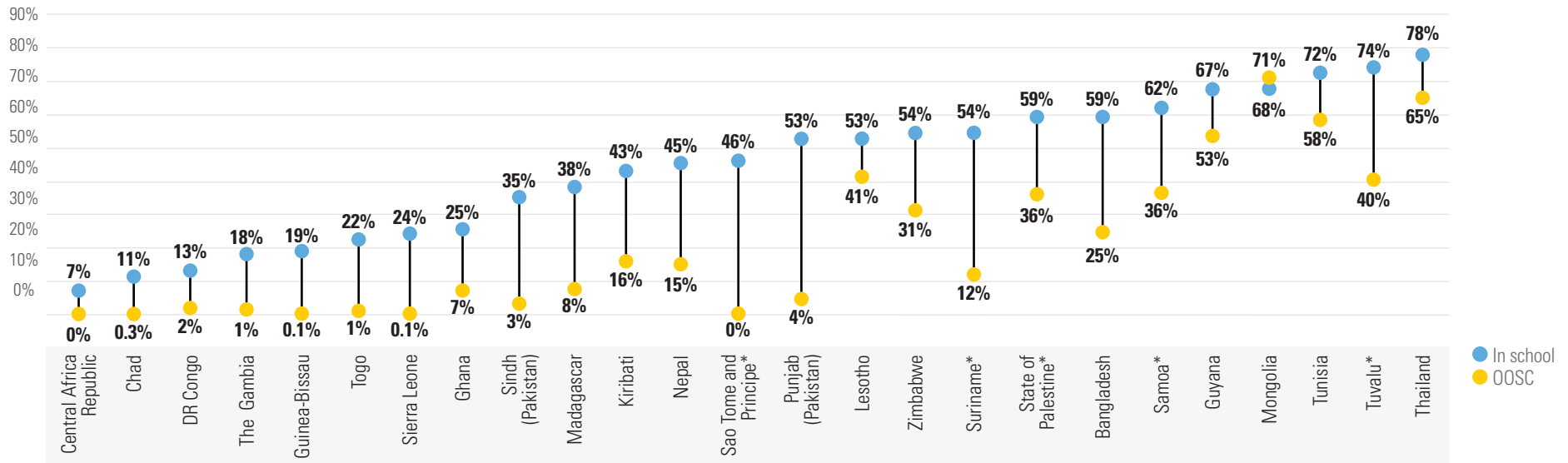


**Source:** Multiple Indicator Cluster Surveys Round 6 (2017-2021)

*Sample size is between 25 and 50 observations.
Note: Only countries that have some out-of-school children are displayed. Countries with observations below 25 have been dropped.

**FIGURE 7.** Percentage of children aged 8-14 with foundational numeracy skills by school attendance
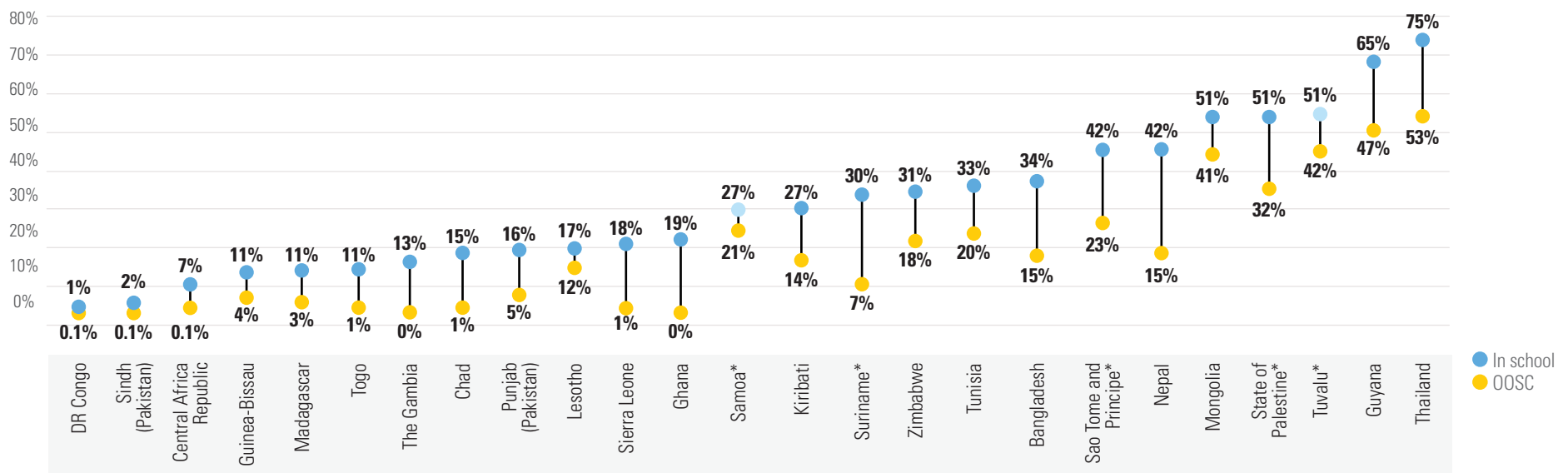


**Source:** Multiple Indicator Cluster Surveys Round 6 (2017-2021)

*Sample size is between 25 and 50 observations.
Note: Only countries that have some out-of-school children are displayed. Countries with observations below 25 have been dropped.

# Marginal effects

Although the plight of out-of-school children cannot be underplayed, the analysis will once again return to focus on children who are attending school, since it is in school that children have the greatest potential to learn. In order to understand the factors that prevent so many schoolchildren from acquiring foundational learning skills, logistic regression has been performed on pooled data from 32 countries and territories. The regression estimates the probability of children who are attending Grade 3 (the target grade for the assessment) having foundational learning skills while controlling for other factors such as gender, location, wealth quintile, and home environment.[17]

When looking at the factors that impede the attainment of foundational learning skills, poverty is the most striking, particularly with regard to reading skills. The likelihood that a child in the lowest wealth quintile has foundational reading skills is 16 percentage points lower than for a child from the highest wealth quintile. For foundational numeracy, the difference is 9 percentage points. Other factors that influence foundational reading skills include gender, urban-rural location, functional difficulty status, parental involvement in their children's education, and the home environment. The probability of having foundational reading skills is somewhat lower for boys than for girls, although for foundational numeracy skills, it is slightly higher for boys than for girls. Moreover, the probability of having foundational reading skills is lower for rural dwellers than for urban dwellers. For children with functional difficulties, the likelihood of having foundational reading skills is 5 percentage points lower than for children without these difficulties.

For both reading and numeracy, parental involvement in school, the home environment, and mothers' education are also important predictors of having these skills, findings which are in line with previous studies.[18] Children whose parents do not attend meetings at the school or help them with their homework have a lower probability of having foundational learning skills, as do children who have no child-oriented books at home, or their mothers have less than a primary education. If parental participation in school helps improve the learning environment at school, assistance could be offered to families, such as ensuring that school meetings are held during times that are convenient for parents, and that parents are well informed of any upcoming meetings so they can plan accordingly. Similarly, if having books at home

helps children learn more, then children's books can be made available to families for free or at very low cost to encourage reading at home, using different strategies. For example, eBooks for children are often available for free in multiple languages, opening up the possibility for children to access many books on smartphones or other devices. Digital and other books can also be made available in multiple accessible formats so that learners with disabilities can access them as well. In cases where digital devices are less accessible, school libraries could enable children to borrow and return books on a regular basis. In terms of mother's education, although it is important to invest in the education of women and girls for their own sake, educating girls may have the residual benefit down the road of helping their children learn as well.



**Pupils of a Complementary Basic Education class in Afuaminyi, Krachi-East District in the Volta Region**

© UNICEF/UN031899/Ademuyiwa

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17. The regression equation used in the analysis includes the foundational reading and numeracy skills of children who are attending Grade 3 as the outcome variable, while controlling for the following factors: age, age squared, gender, urban-rural location, wealth quintile, child labour status, functional difficulty status, parental attendance of school meetings, parental support with homework, book availability at home, and mothers' level of education. The regression produces marginal effects, which is the strength of the association between each of these factors and a child having foundational reading or numeracy skills.
18. See for example Sebastian, J., Moon, J.-M., and Cunningham, M. (2017). The Relationship of school-based parental involvement with student achievement: a comparison of principal and parent survey reports from PISA 2012. Educ. Stud. 43, 123–146. And Akram, S. and Peraiz, Z. (2020). Mother's education as a predictor of individual's opportunities to learn and earn. *Elementary Education Online, 19(4), 879-884*.

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**FIGURE 8.** Change in the likelihood of having foundational reading skills of children attending Grade 3 by various characteristics
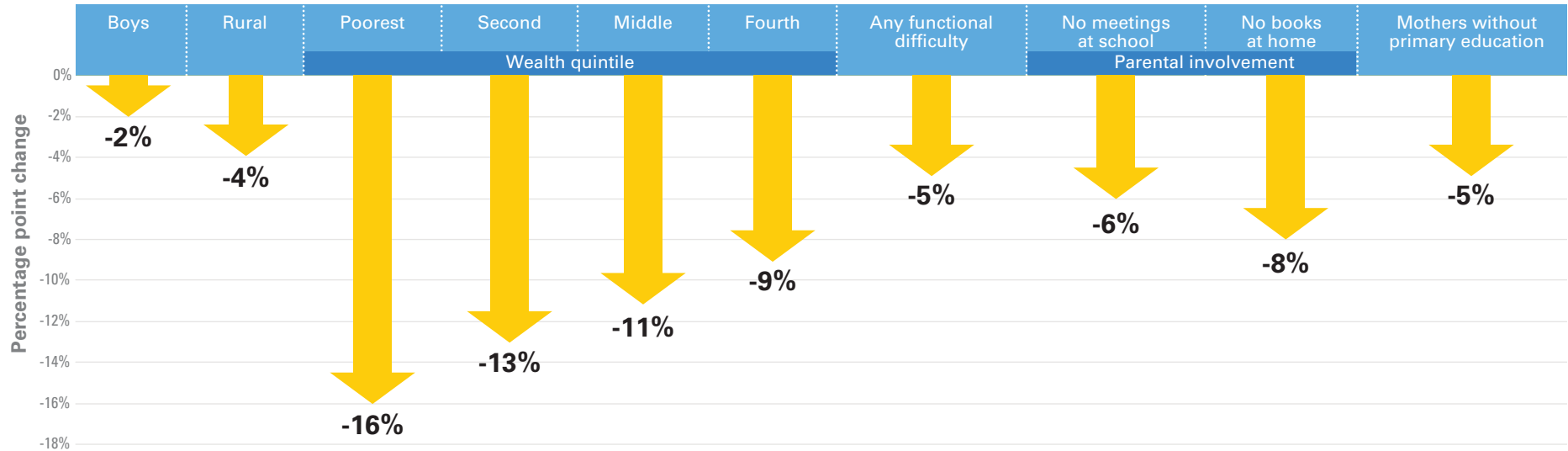


| Boys | Rural | Poorest | Second | Middle | Fourth | Any functional difficulty | No meetings at school | No books at home | Mothers without primary education |
|------|-------|---------|--------|--------|--------|---------------------------|-----------------------|------------------|-----------------------------------|
| | | | Wealth quintile | | | | Parental involvement | | |
| -2% | -4% | -16% | -13% | -11% | -9% | -5% | -6% | -8% | -5% |

**Source:** Multiple Indicator Cluster Surveys Round 6 (2017-2021)

Note: The reference category for wealth is the richest 20 per cent of households. Only significant results are presented.

**FIGURE 9.** Change in the likelihood of having foundational numeracy skills of children attending Grade 3 by various characteristics



| Boys | Rural | Poorest | Second | Middle | Fourth | Any functional difficulty | No meetings at school | No books at home | Mothers without primary education |
|------|-------|---------|--------|--------|--------|---------------------------|-----------------------|------------------|-----------------------------------|
| | | | Wealth quintile | | | | Parental involvement | | |
| 1% | -9% | -7% | -6% | -4% | -3% | -3% | -2% | -2% | -4% |
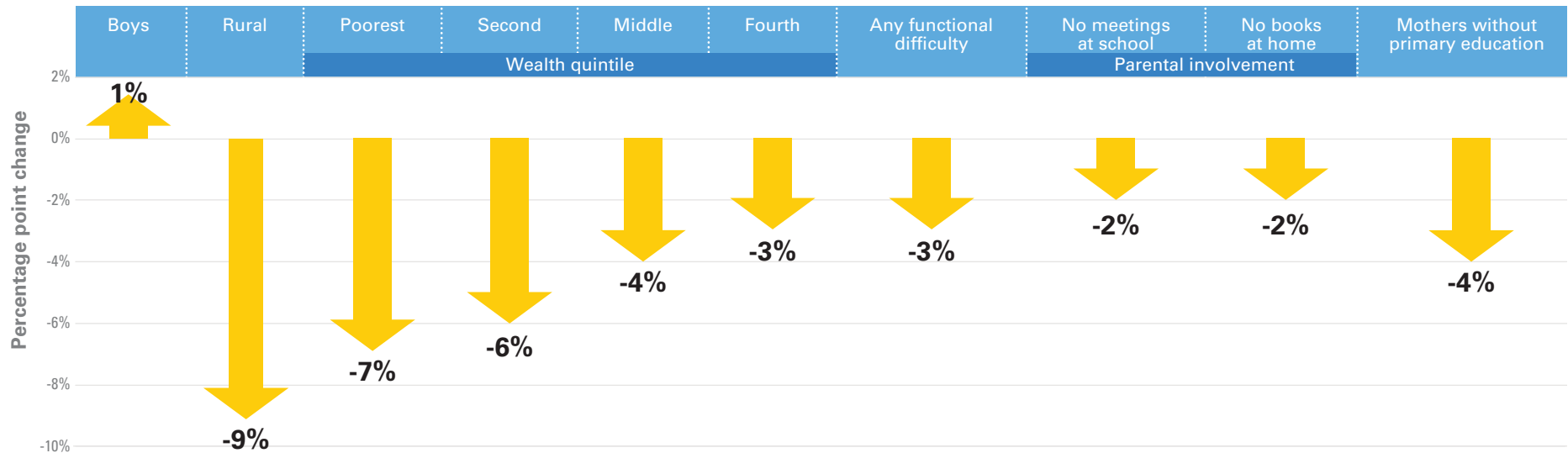
**Source:** Multiple Indicator Cluster Surveys Round 6 (2017-2021)

Note: The reference category for wealth is the richest 20 per cent of households. Only significant results are presented.

**Adolescent girls attending their class in UNICEF supported Accelerated Learning Programme (ALP) center in Hussain Buksh Jatoi village, Khairpur district, Sindh province, Pakistan.**

© UNICEF/UN0308127/Zaidi

# Wealth Inequality

Since the regression analysis indicates that wealth appears to be the biggest predictor of having foundational learning skills, it is worth examining this issue in greater detail. Virtually all the countries analyzed have a gap in learning between children attending Grade 3 who come from the richest and poorest wealth quintiles, although the gap is more pronounced in some countries than in others. For foundational reading skills, the median gap is 22 percentage points, although it is about 50 percentage points in Kiribati and Zimbabwe, while it is below 10 percentage points in Belarus, the Central African Republic, Chad, and Kosovo. For foundational numeracy skills, the rich-poor gap is smaller overall, with a median gap of 9 percentage points, although Nepal and Turkmenistan have gaps as high as 35 and 32 percentage points, respectively. In several sub-Saharan African countries, including the Central African Republic, the Democratic Republic of the Congo, and Lesotho, the gap is 2 percentage points or less for foundational numeracy skills because skills are so low across the board that even the overwhelming majority of wealthier children are still not learning enough.

Overall, the findings suggest that wealthier children tend to have an advantage in learning, particularly when it comes to foundational reading skills. However, in some countries, especially those in sub-Saharan Africa, even the wealthier children are not learning enough, which could be linked to underlying problems with the quality of education, including those related to pedagogical approaches, teacher training, curriculum, and learning materials. On the other hand, there are some instances where children from poorer households are learning almost on par with their wealthier peers, such as in Belarus, Kyrgyzstan, Mongolia, and Thailand. Although particular attention needs to be paid to raising the foundational learning skills of children from poorer households, efforts are still needed to ensure that all children, regardless of family income, have the same opportunity to learn.

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**FIGURE 10.** Gap in share of children attending Grade 3 from the richest and the poorest wealth quintile who have foundational reading skills, with country average
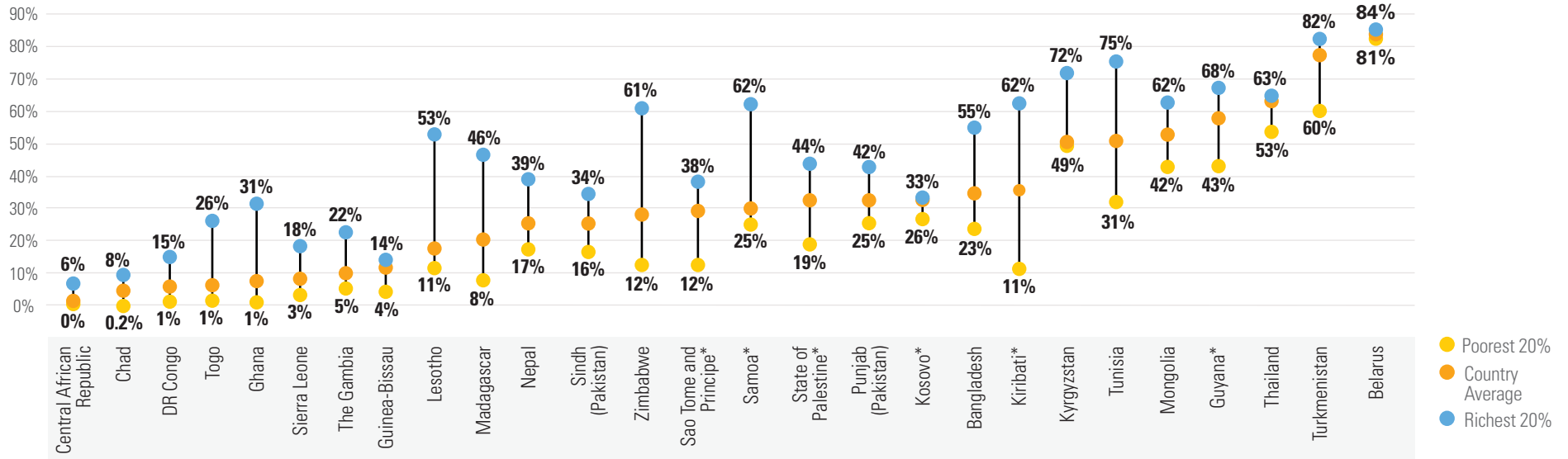


**Source:** Multiple Indicator Cluster Surveys Round 6 (2017-2021)

*Sample size is between 25 and 50 observations.
Note: Only countries that have some out-of-school children are displayed. Countries with observations below 25 have been dropped.

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**FIGURE 11.** Gap in share of children attending Grade 3 from the richest and the poorest wealth quintile who have foundational numeracy skills, with country average
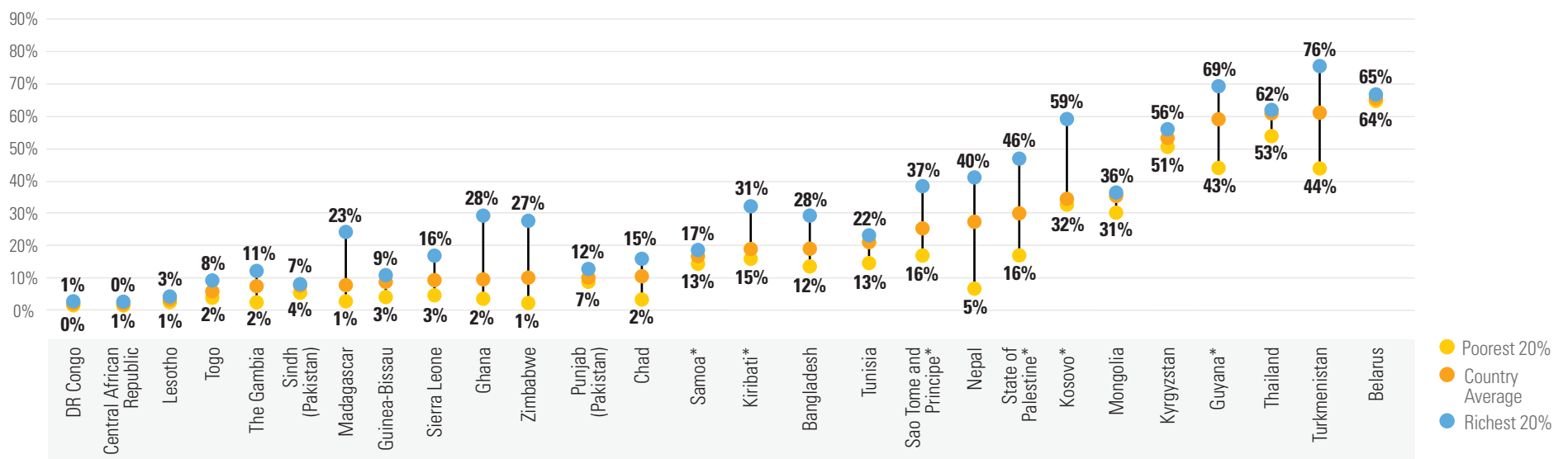


**Source:** Multiple Indicator Cluster Surveys Round 6 (2017-2021)

*Sample size is between 25 and 50 observations.
Note: Only countries that have some out-of-school children are displayed. Countries with observations below 25 have been dropped.

# Progress

Although the foundational learning module is geared towards what a child is expected to know or be able to do by Grade 2, some children do not acquire these skills until they reach higher grades. The chart on learning progression for children attending Grades 3 through 8 provides a clear and compelling indication that children learn more the longer they stay in school. Although the relationship is not entirely linear for all countries, the trend still shows that a greater share of children in Grade 8 have foundational learning skills, in both reading and numeracy, than children in lower grades. The median rises from 30 per cent in Grade 3 to 77 per cent in Grade 8 for foundational reading skills, and from 18 per cent to 46 per cent for foundational numeracy skills. The fluctuations from grade to grade are a reflection of small sample sizes in some countries, and as such, it is more important to focus on the general trend than the occasional ups and downs. Of note, however, the learning curve tends to be relatively steep for foundational reading and relatively flat for foundational numeracy skills. This could indicate that if children fail to learn basic numeracy concepts in the early grades, they will have a difficult time catching up as they progress through school, whereas children have more of an opportunity to catch up on reading skills if they remain in school.

As noted in the overview, fewer than half of children in most countries analyzed have either foundational reading or numeracy skills by the time they reach Grade 3. Substantial gains, however, are made by the time children reach Grade 8, especially for reading. By Grade 8, in all but three countries (the Central African Republic, the Democratic Republic of the Congo, and Kosovo) at least half, and in many cases three-fourths or more of children have acquired foundational reading skills. The picture is less encouraging for numeracy, however, as even by Grade 8, in 18 of the 32 countries and territories analyzed, fewer than half of children have foundational numeracy skills. Although the data do show that children continue to learn the longer

they remain in school, in most countries the learning trajectories are too flat, with children learning too little from one grade to the next. It is disconcerting that all children have not been able to acquire the foundational learning skills that they should have had in Grade 3 even by Grade 8.

The findings on progression through school also point to two different groups of learners. There are countries such as Togo where children start out at a very low level of reading skills in Grade 3, in this instance only 6 per cent of children have foundational reading skills, but then they catch up by Grade 8 to where 70 per cent of children have these skills, displaying a rather steep learning trajectory. Chad provides an example of a country with a fairly steep learning curve for foundational numeracy skills. In Grade 3 only 9 per cent of children have these skills, but by Grade 8 the share of children with foundational numeracy skills has risen to 63 per cent. It is important to consider, however, that some of this increase may be driven by low performers dropping out at the end of primary school. In other countries such as Belarus, where the level of learning starts out relatively high in Grade 3 (at 82 per cent for reading and 71 per cent for numeracy), the progression is more modest because most foundational learning takes place in earlier grades. To enable more children to start out at a higher level of foundational learning in Grade 3, more resources could be invested in pre-primary education and early learning, as well as greater emphasis on this phase of schooling, so not as much attention needs to be paid to "catch up" learning as children progress through school. If children can master foundational learning skills in the early grades, they can move on to higher order skills in later grades, rather than continuing to focus on the basics.

Although staying in school longer tends to pay off in terms of children's learning outcomes for all countries, the children in Africa appear to require several additional years of schooling to attain the skills they should have
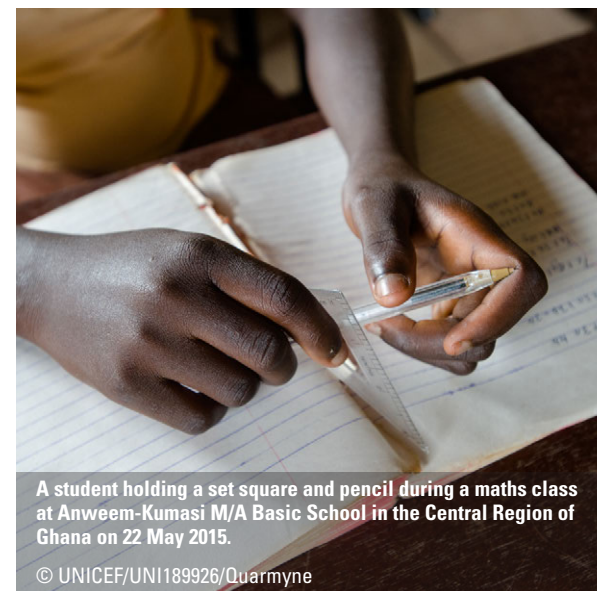


**A student holding a set square and pencil during a maths class at Anweem-Kumasi M/A Basic School in the Central Region of Ghana on 22 May 2015.**

© UNICEF/UNI189926/Quarmyne

mastered by Grade 3. In eight out of the 13 African countries analyzed, fewer than 10 per cent of children have foundational reading skills at Grade 3, the target grade for these skills. It is not until Grade 8 that at least half of the children have these reading skills (although this is still not the case in Central Africa Republic and the Democratic Republic of the Congo). Guinea-Bissau and Lesotho display the largest gains in foundational reading skills from Grade 3 to Grade 8, increasing by 72 and 75 percentage points, respectively, although dropouts of low performers could explain part of the increase. There remain some particularly worrisome cases as well, especially regarding numeracy skills. In the Democratic Republic of the Congo, for example, even by Grade 8 just 5 per cent of children have acquired the foundational numeracy skills they should have mastered in Grade 3. Greater investment is needed, therefore, to steepen the learning trajectories so that children enter Grade 3 knowing how to read and handle basic numeracy, thereby enabling them to fully engage in increasingly complex curriculum as they advance through school.

**FIGURE 12.** Foundational reading skills by highest grade attended, Grades 3 to 8
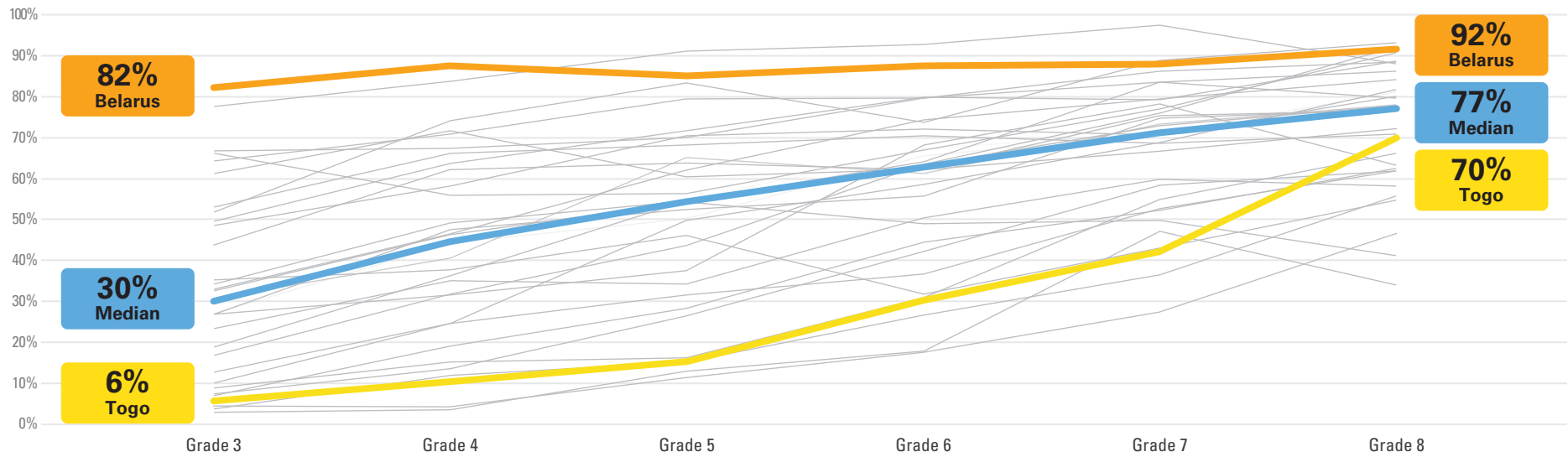
**82%** Belarus

**30%** Median

**6%** Togo

**92%** Belarus

**77%** Median

**70%** Togo

Grade 3 Grade 4 Grade 5 Grade 6 Grade 7 Grade 8

**Source:** Multiple Indicator Cluster Surveys Round 6 (2017-2021)
Note: Due to small sample sizes, there may be fluctuations in the trend lines that are not necessarily representative of children's actual progress.

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**FIGURE 13.** Foundational numeracy skills by highest grade attended, Grades 3 to 8

**71%** Belarus

**18%** Median

**9%** Chad

**94%** Belarus

**63%** Chad

**46%** Median

Grade 3 Grade 4 Grade 5 Grade 6 Grade 7 Grade 8

**Source:** Multiple Indicator Cluster Surveys Round 6 (2017-2021)
Note: Due to small sample sizes, there may be fluctuations in the trend lines that are not necessarily representative of children's actual progress.

# Projection of years of schooling

While staying in school is certainly beneficial for children, in many countries, the translation of added years of schooling into added learning happens far too slowly. Although significant gains have been made in recent years in access to education, with most countries approaching universal primary education, there have not been the same corresponding gains in learning. There is a notable difference between schooling and learning, as the global learning crisis can attest. It's not just the number of years that a child spends in school that count, even more important is the quality of instruction and a conducive learning environment. Children should have foundational learning skills by the end of Grade 2, but at the rate

children are actually learning, it could take them far longer before they acquire these skills.

To help illustrate inefficiencies in many educational systems, the chart provides an estimate of the number of years of primary school it would take for 70 per cent of students to have acquired foundational learning skills. This estimate takes into account the current rate of learning from Grade 1 through the end of primary school in each country, and then projects at which point the 70 per cent benchmark would be reached. In terms of foundational reading skills, in all but two countries, Belarus and Turkmenistan, it would take at least five years of primary school for 70 per cent of

children to have the reading skills they should have had by the end of Grade 2. Across the 32 countries and territories analyzed, the median number of years of primary schooling needed to achieve this benchmark is seven. In the majority of countries under study, primary school lasts si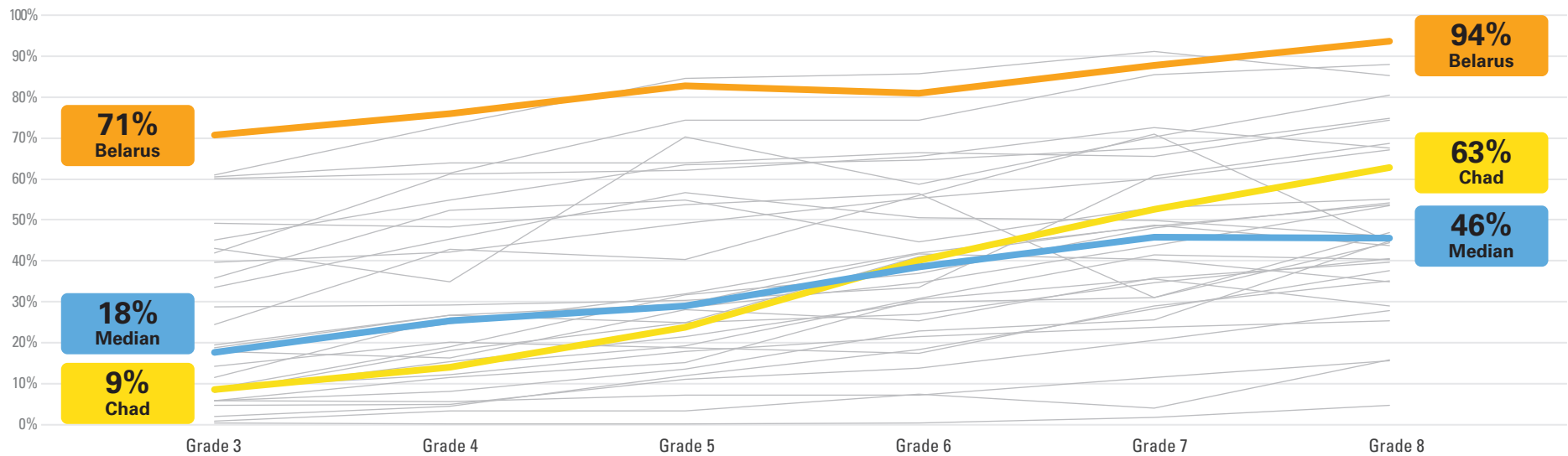x years or less. This means that even after completing primary school, on average fewer than seven in 10 children can be expected to have foundational reading skills.

For some countries, the rate of learning is so low that children would have to remain in primary school for 10 years or more before 70 per cent of them would have foundational reading skills. The Central African Republic and the Democratic Republic of the Congo represent two extreme cases, where at the current rate of learning, children would have to remain in primary school for 25 years before 70 per cent of their peers would have the reading skills they should have acquired after just two years of schooling. The situation for foundational numeracy skills is even more discouraging. The median number of years of primary schooling it would take for 70 per cent of children to have these numeracy skills is 11, which is roughly twice the average length of primary school in most countries. Most troubling is that in a handful of countries, namely Togo, Samoa, the Central African Republic, Sindh (Pakistan), and the Democratic Republic of the Congo, at the current pace of learning it would take decades of primary schooling before children would reach the 70 per cent threshold. And this is just to reach a 70 per cent threshold. Universal acquisition of foundational learning skills could take even longer. Much more needs to be done to improve the quality and efficiency of the education system so that the years children spend in primary school reap more immediate rewards in terms of building foundational skills early on, so that they can move on to more complex skills as they progress through school.



**Children on their way to school at the site of Fourkouloum, in the West of Chad.**

© UNICEF/UN0470286/Dejongh

**FIGURE 14.** Years needed for children to be in primary school to reach threshold of 70 per cent having foundational reading skills
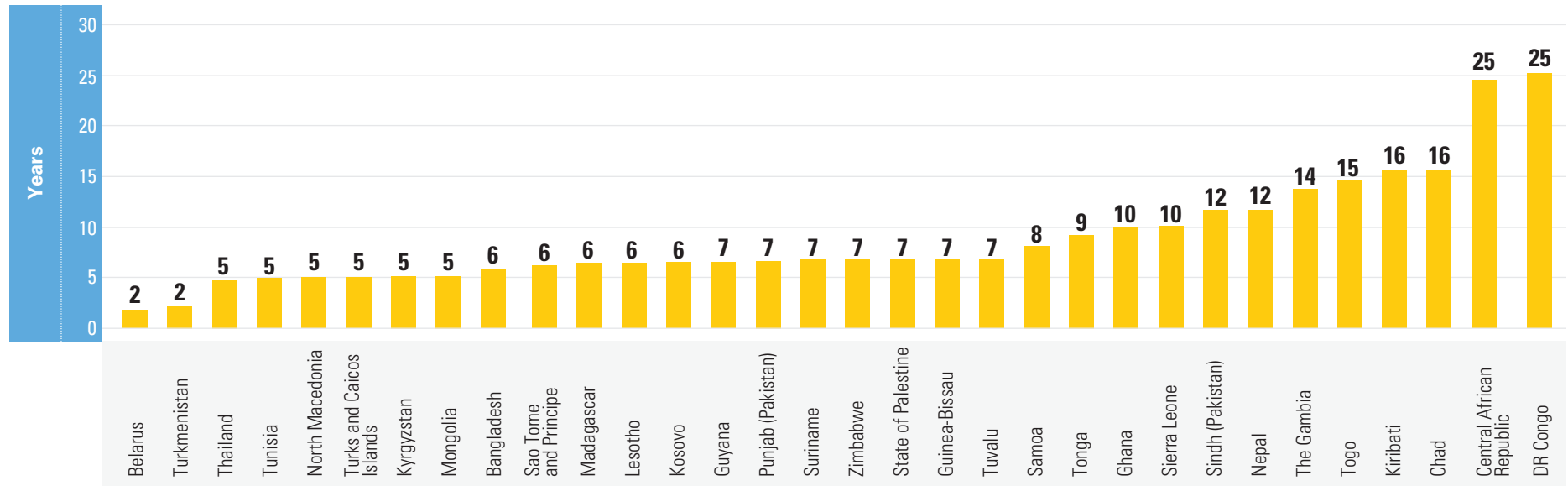


**Source:** Multiple Indicator Cluster Surveys Round 6 (2017-2021)

**FIGURE 15.** Years needed for children to be in primary school to reach threshold of 70 per cent having foundational numeracy skills



**Source:** Multiple Indicator Cluster Surveys Round 6 (2017-2021)

28
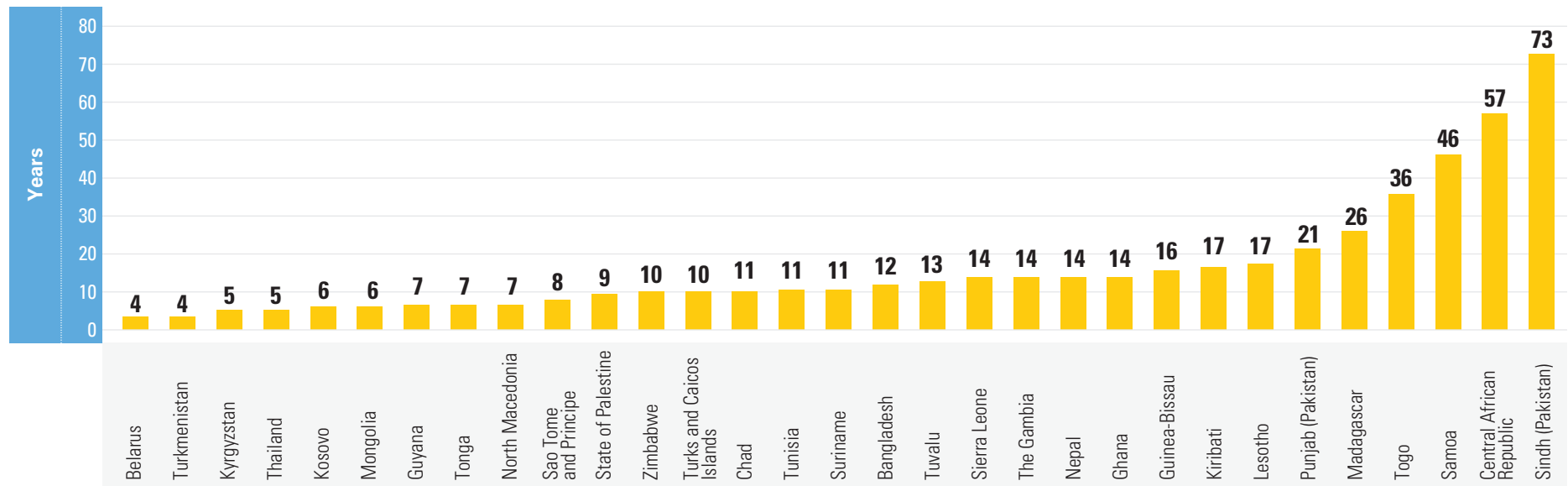


**March 2016, Satinat, 9 years of age, standing behind a door in front of her home in Buddhi village, Kapilvastu District.**

© UNICEF/UN0282262/Pirozzi

# Gender

Girls and boys can have different educational experiences. When it comes to foundational reading skills, girls tend to have the advantage. In most countries studied, the gap in reading in favour of girls is 10 percentage points or less, although in the case of Lesotho, Samoa, and North Macedonia, the advantage that girls have in reading is 19, 13 and 12 percentage points, respectively. When it comes to numeracy, the findings are more mixed, with girls having an advantage in some countries, and boys in others. But with the exception of North Macedonia, where the gap is 11 percentage points in favour of boys, and Guyana where the gap is 12 percentage points in favour of girls, the gaps are relatively small i.e., 4 percentage points or less. So in most countries there is not a notable difference in learning outcomes by gender, especially where foundational numeracy skills are concerned.

Boys can also face disadvantages concerning their education, as in some countries they are more likely to drop out of school or participate in child labour, which can affect their ability to learn. Nevertheless, the generally low rates of foundational learning skills for both boys and girls indicates that greater efforts are needed to improve learning for all children, regardless of sex.

Although girls are beginning to gain ground globally in terms of foundational reading skills, thanks in part to interventions targeting girls' education, this progress remains tenuous given the biases that girls and women continue to face. Moreover, foundational learning skills are just one of multiple facets of gender equality, and do not provide the full picture. Among the barriers girls continue to encounter are higher rates of exclusion from secondary school in many contexts, gender norms and stereotypes which can impact adolescent girls' engagement in learning, and higher not-in-education-employment-training (NEET) rates and lower access to the job market, especially high value jobs in the STEM sectors. Nonetheless, achievements in learning outcomes among girls is something to be applauded, owing in part to the efforts of gender equality activists across the global education community, as well as that of governments and civil society to facilitate girls' access to quality education.

**FIGURE 16.** Gap between share of girls and boys with foundational reading skills, among children currently attending Grade 3 to 8

| | |
|---|---|
| BOYS ARE MORE ADVANTAGED | GIRLS ARE MORE ADVANTAGED |

-5%　0%　5%　10%　15%　20%

| Country | Value |
|---|---|
| Lesotho | 19% |
| Samoa | 13% |
| North Macedonia | 12% |
| Kiribati | 10% |
| Turks and Caicos Islands | 10% |
| State of Palestine | 9% |
| Guyana | 9% |
| Zimbabwe | 7% |
| Sao Tome and Principe | 7% |
| Thailand | 6% |
| Punjab (Pakistan) | 5% |
| Belarus | 5% |
| Bangladesh | 5% |
| Kyrgyzstan | 4% |
| Madagascar | 4% |
| Tunisia | 4% |
| Tonga | 4% |
| The Gambia | 3% |
| Tuvalu | 3% |
| Nepal | 2% |
| Sindh (Pakistan) | 2% |
| Ghana | 2% |
| Suriname | 2% |
| Togo | 1% |
| Mongolia | 1% |
| Kosovo | 1% |
| Turkmenistan | 1% |
| Guinea-Bissau | 1% |
| Central African Republic | 0% |
| DR Congo | -1% |
| Chad | -1% |
| Sierra Leone | -2% |
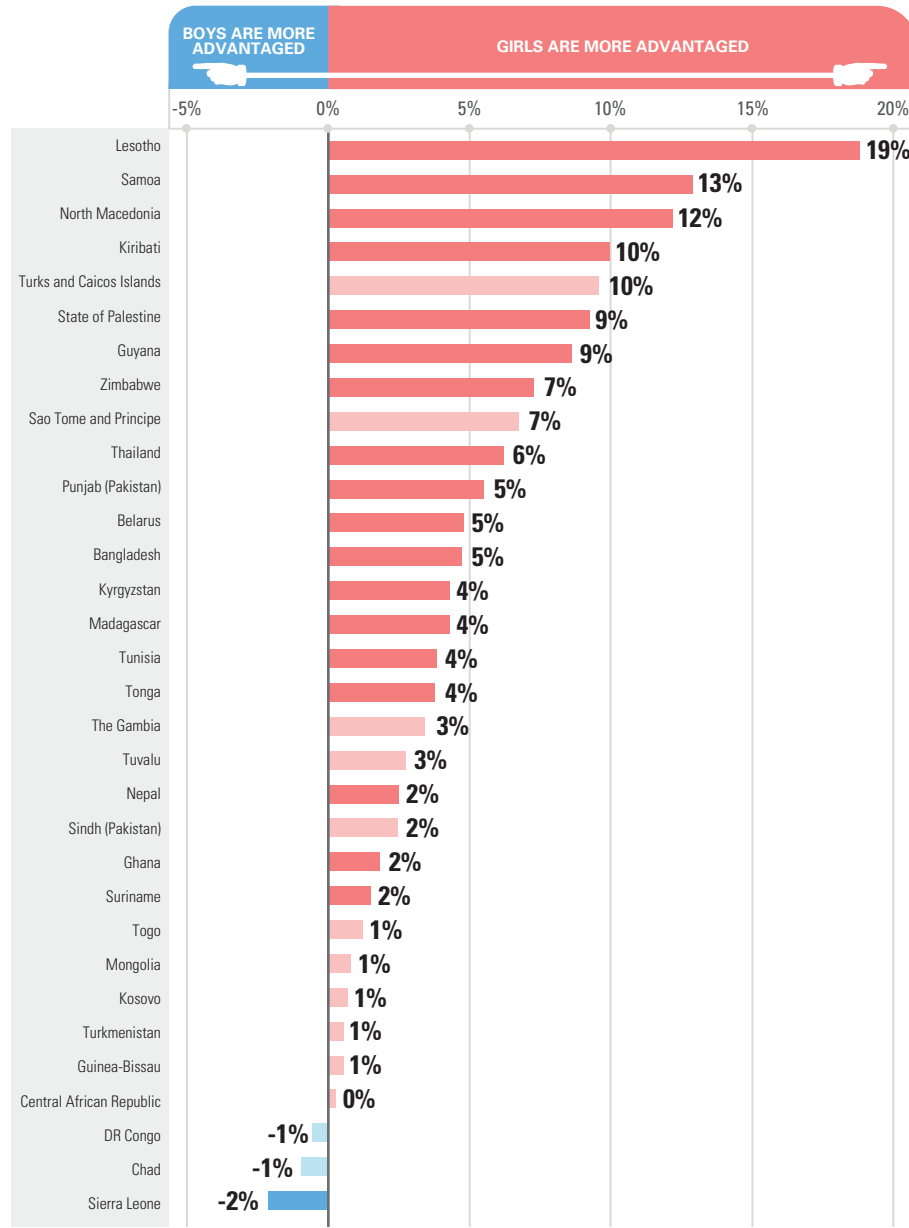
**Source:** Multiple Indicator Cluster Surveys Round 6 (2017-2021)

Note: Insignificant differences are displayed in a lighter colour.

**FIGURE 17.** Gap between share of girls and boys with foundational numeracy skills, among children currently attending Grade 3 to 8
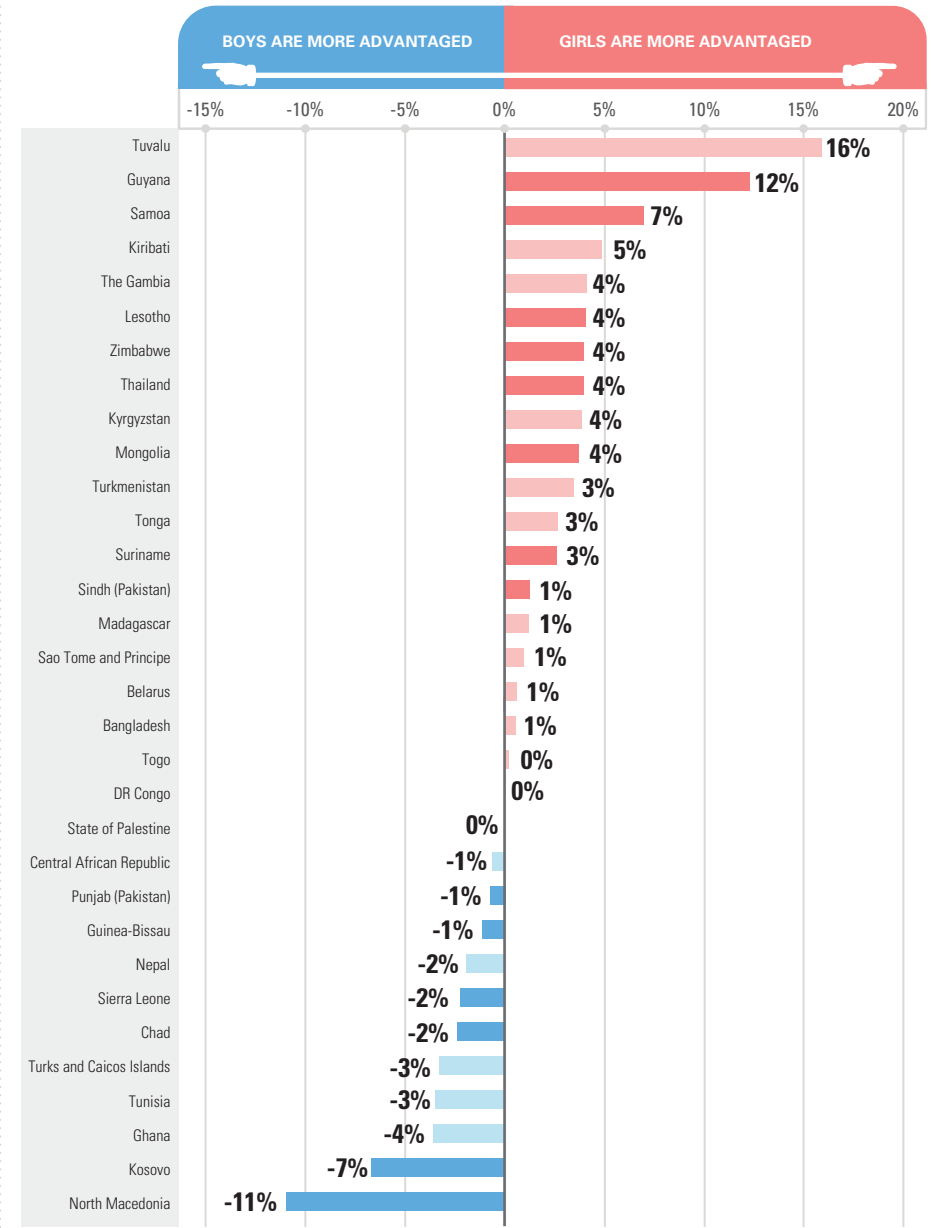
| | |
|---|---|
| BOYS ARE MORE ADVANTAGED | GIRLS ARE MORE ADVANTAGED |

-15%　-10%　-5%　0%　5%　10%　15%　20%

| Country | Value |
|---|---|
| Tuvalu | 16% |
| Guyana | 12% |
| Samoa | 7% |
| Kiribati | 5% |
| The Gambia | 4% |
| Lesotho | 4% |
| Zimbabwe | 4% |
| Thailand | 4% |
| Kyrgyzstan | 4% |
| Mongolia | 4% |
| Turkmenistan | 3% |
| Tonga | 3% |
| Suriname | 3% |
| Sindh (Pakistan) | 1% |
| Madagascar | 1% |
| Sao Tome and Principe | 1% |
| Belarus | 1% |
| Bangladesh | 1% |
| Togo | 0% |
| DR Congo | 0% |
| State of Palestine | 0% |
| Central African Republic | -1% |
| Punjab (Pakistan) | -1% |
| Guinea-Bissau | -1% |
| Nepal | -2% |
| Sierra Leone | -2% |
| Chad | -2% |
| Turks and Caicos Islands | -3% |
| Tunisia | -3% |
| Ghana | -4% |
| Kosovo | -7% |
| North Macedonia | -11% |

**Source:** Multiple Indicator Cluster Surveys Round 6 (2017-2021)

Note: Insignificant differences are displayed in a lighter colour.

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# Functional difficulty

Children who face physical, behavioural, and emotional difficulties can be at further disadvantage when it comes to learning, especially if schools fail to make the necessary accommodations to facilitate their successful participation. A new MICS module on child functioning sheds light on the educational experiences of children with functional difficulties by delineating 12 functional domains. These include accepting change, communication, hearing, remembering, walking, affect/emotion (anxiety and depression), concentrating, learning, seeing, controlling behaviour, making friends, and self-care.[19] A report on Inclusive Education in Western and Central Africa goes into greater depth about these domains and the educational experiences of children with and without functional difficulties.

Although children with functional difficulties can face additional barriers to learning, by and large they attend primary school at levels comparable to children without functional difficulties.[20] Among the 21 countries[21] for which data are

available, the median adjusted net attendance rate (ANAR) for primary school is 95 per cent for children both with and without functional difficulties. The ANAR between the two groups of children differs in some countries, but only in the Democratic Republic of the Congo, Guinea-Bissau, and Chad are the differences greater than 3 percentage points in favour of children without functional difficulties.

Just because children with and without functional difficulties are attending primary school at comparable rates, it does not necessarily mean that they are also learning at comparable rates. The median share of children without functional difficul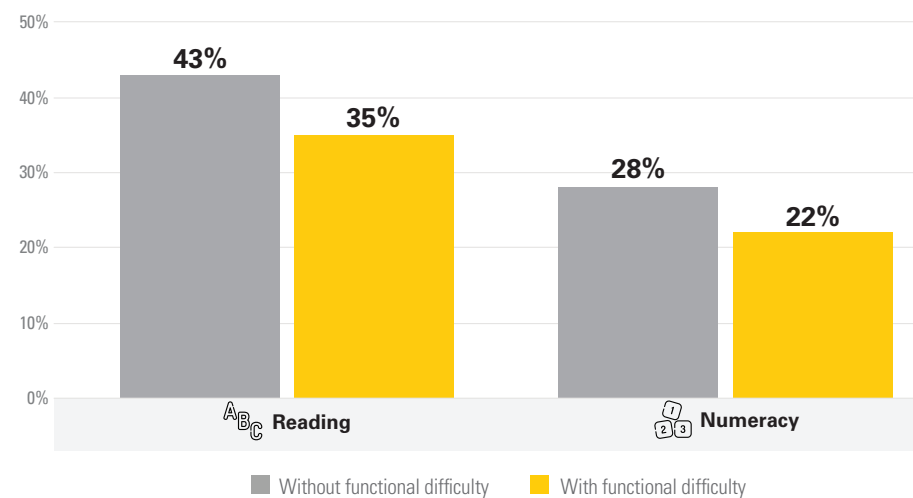ties who have foundational reading skills is 43 per cent, while the rate for children with functional difficulties is 35 per cent. Similar differences exist for foundational numeracy skills, as the median share of children who have these skills is 28 per cent for those without functional difficulties, compared to 22 per cent for children with functional difficulties.



Syaeful, who has a physical impairment, plays with his best friend Kevin, a child with a visual impairment, in Banyumas, Central Java. Both of them benefit from an inclusive education programme for children with disabilities in their school.

© UNICEF/ UNI358829/Ijazah

**FIGURE 18.** Median share of children with foundational learning skills, by functional difficulty status



**Source:** Multiple Indicator Cluster Surveys Round 6 (2017-2021)

19. Please note that the assessment tool used in the MICS6 survey does not provide relevant accommodation for children with functional difficulties. This would mean, for example, that the tool was not available in braille or sign language for children who may require this format to participate in the assessment.
20. It should be noted that the MICS6 survey does not provide information on the type of school that children are attending, such as whether it is an inclusive school, accommodating both children with and without functional difficulties, or if it is a special education school that only serves children with functional difficulties.
21. The 21 countries are Belarus, the Central African Republic, Chad, the Democratic Republic of the Congo, the Gambia, Ghana, Guinea-Bissau, Guyana, Kiribati, Kosovo, Lesotho, Nepal, North Macedonia, Samoa, Sao Tome and Principe, Sierra Leone, Togo, Tonga, Turkmenistan, Turks and Caicos Islands, and Tuvalu.

**FIGURE 19.** Change in likelihood of students attending Grade 3 to 8 having foundational reading skills by functional difficulty
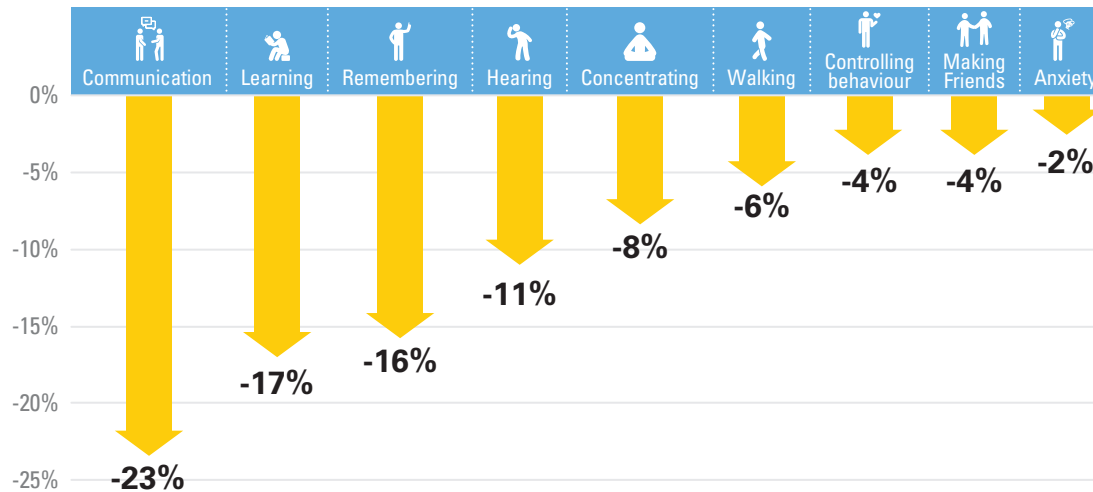


**Source:** Multiple Indicator Cluster Surveys Round 6 (2017-2021)
Note: Only statistically significant values are shown

**FIGURE 20.** Change in likelihood of students attending Grade 3 to 8 having foundational numeracy skills by functional difficulty
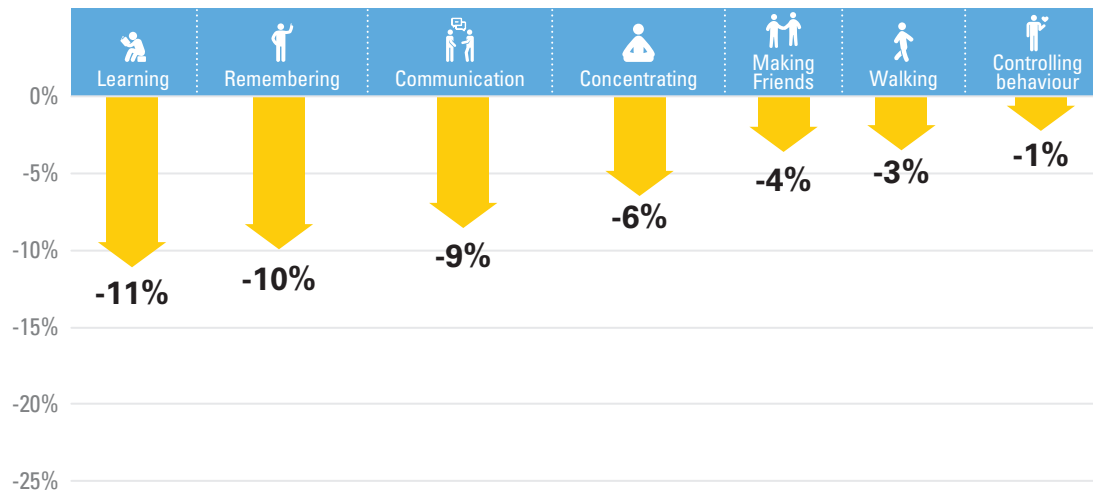


**Source:** Multiple Indicator Cluster Surveys Round 6 (2017-2021)
Note: Only statistically significant values are shown

To explore potential differences in learning outcomes by functional difficulty status, regression analysis has been performed to assess the likelihood of students attending Grade 3 to Grade 8 of having foundational learning skills according to each of the 12 functional domains.[22] The results indicate in eight of the 12 functional domains, students with a particular functional difficulty are less likely to have foundational reading skills than students without that difficulty. The difference is largest for children with communication difficulty, as students with this functional difficulty are 23 percentage points less likely to have foundational reading skills than children without communication difficulty. Students with learning difficulty and remembering difficulty also display relatively large differences in learning, as they are respectively 17 and 16 percentage points less likely to have foundational reading skills than students without these difficulties.

For foundational numeracy skills, the differences are less pronounced. In only six of the 12 functional domains are students with a specific functional difficulty less likely to have foundational numeracy skills than students who do not have that difficulty. The differences are greatest for children with learning and remembering difficulties, as students with these difficulties are 11 and 10 percentage points, respectively, less likely to have foundational numeracy skills as students who do not have these specific difficulties.

While children with functional difficulties may be attending school at similar rates to their peers without functional difficulties, they are not always learning at the same rate. They also may not be learning in the same place, although data are not available on the type of school children are attending, as it could have been either an inclusive or a special education school.[23] Particularly for students with communication, learning, and remembering difficulties, the likelihood of their having foundational learning skills are significantly lower than for students without these difficulties. This signals that added attention is needed to ensure that children with functional difficulties are able to learn on par with their peers. Children who have functional difficulties may require special efforts to support them on their individual learning journeys, and their lower levels of achievement in some instances indicates that more needs to be done to provide them the support they need to succeed.

22. The regression equation used in the analysis includes the foundational reading and numeracy skills of children who are attending Grades 3 to Grade 8 as the outcome variable, while controlling for the following factors: gender, age, age-squared, urban-rural location, wealth quintile, and the 12 functional domains. The regression produces marginal effects, which is the strength of the association between each of these factors and a child having foundational reading or numeracy skills.
23. An inclusive school is open to all children, regardless of functioning, whereas a special education school is designed for children with specific needs, such as a school for blind children.

**Children and mothers at the mines site of Pissy, a suburban of Ouagadougou, the capital of Burkina Faso.**

© UNICEF/UNI394755/Dejongh

# Child labour

Few would argue that the best for children is to be in school, rather than being out of school and engaged in child labour. But the reality is that too many children from poor households are forced to work to help support their families. Children may engage in either paid or unpaid work that is not harmful to them, but to be classified as child labour, the child must be either too young to work or be involved in harmful activities that may compromise their physical, mental, social or moral development, or that interferes with their schooling. Child labour that interferes with schooling may deprive children of the opportunity to attend school, or oblige them the leave school early, or force them to attempt to combine schooling with excessive hours of heavy work.[24]

This analysis compares the acquisition of foundational reading skills among children age 7 to 14 who are involved in child labour and are currently not attending school, with children who are not in child labour and are attending school.[25] Since it is often the children from the poorest households who are engaged in child labour, the analysis is limited to the experiences of children from the poorest 40 per cent of households. As visualized in the chart, the differences are quite stark in many countries. In most countries analyzed, children from poorer household who attend school and are not involved in child labour have about double the rate of foundational reading skills than their peers who are engaged in child labour and not attending school, with the gap widening as children get older. In both Bangladesh and Samoa, for example, the predicted probability of a child aged 14 who is out of school and in child labour having foundational reading skills accounts for only 25 per cent, while for those 14-year olds who are in school and not in child labour, it is three times higher, reaching 75 per cent.

In the case of several African countries, including the Central African Republic, Chad, the Democratic Republic of the Congo, the Gambia, Ghana, Guinea-Bissau, Sierra Leone, and Togo, none of the children from poorer households who are out of school and engaged in child labour have foundational reading skills. By having to work instead of attend school, these children are denied the opportunity to learn. The message from the data is clear: children should be in school, and not in child labour. When children are engaged in child labour, they may have to abandon schooling altogether, which means their chances of learning may be slim to none. Without an education, these children run the risk of perpetuating the intergenerational poverty cycle as they won't have a chance to acquire the skills they need for upward mobility.

24. https://www.ilo.org/ipec/facts/lang--en/index.htm
25. Foundational reading skills by country are predicted amongst the 7-14 year old children from the poorest 40 per cent of households with the following set of input variables using logistic regression: school age, sex, school attendance, engagement in child labour, and area of residence.

**FIGURE 21.** Comparison of share of children with foundational reading skills by children not in child labour and attending school versus children in child labour and not attending school, bottom 40 per cent by household wealth index
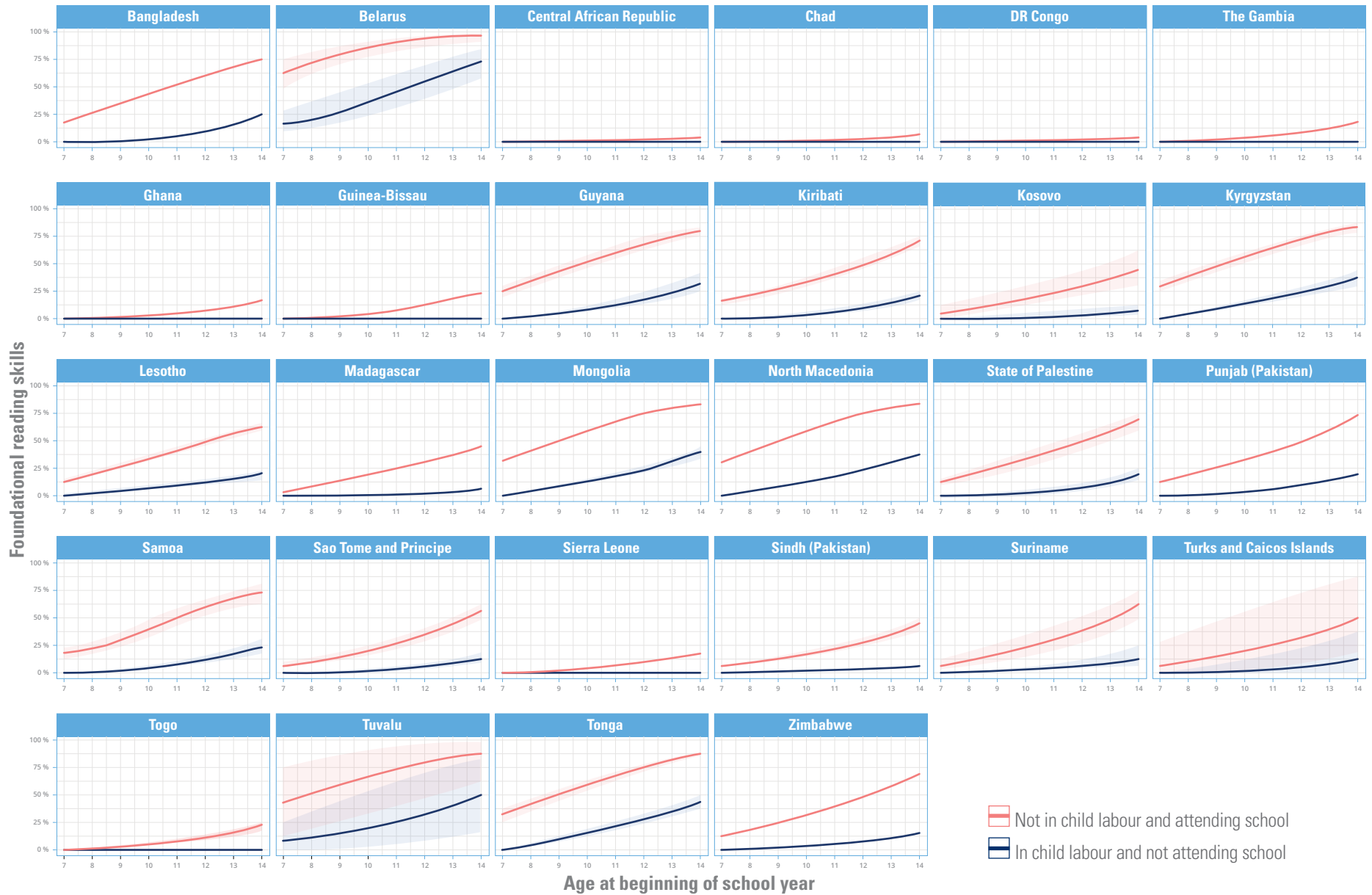


Source: Multiple Indicator Cluster Surveys Round 6 (2017-2021)

A group of students having fun during break time on the balcony after a yearlong wait at Gandaria Mohila Shomity Government Primary School, Dhaka, Bangladesh on 12 September 2021.

© UNICEF/UN0527657/Sujan

# Language

Children need to learn in a language they use and understand. Nevertheless, children can be placed in a situation where the language they are taught in at school may be different from the language they speak at home. The analysis for language looks at the share of children with foundational reading skills and whether there is a "mismatch," meaning that the language of instruction is demonstrably different from the language spoken at the home of the child, or if the language of instruction is the same as the language spoken at the child's home. Regression analysis has been performed to assess the differences by language, while controlling for socio-economic status and expected values are calculated.[26]

The results can be seen as counterintuitive in that countries are roughly divided between those that have a mismatch in language advantage and those that have the same language advantage, while in several countries there is no statistically significant difference. In looking more closely, it is evident that many of the countries

with the mismatch, or secondary language advantage are in Africa, while almost all countries with same language advantage (with the exception of Suriname) are in Asian and Pacific countries.

Part of the explanation for the mismatch in language advantage in Africa may stem from the fact educational resources, teacher training, and teaching materials are more prevalent and of higher quality in education programmes that use a secondary language, often either English or French or other official language of the country. Although the analysis does take into consideration the household wealth quintile, it may not capture differences for children from ethnic and linguistic minorities. There could also be a correlation between the choice of language of instruction and teacher quality in some countries. Further studies are needed, therefore, to understand differences with respect to language and foundational learning skills, which could help to build knowledge in support of more effective, evidence-driven policy making.

**FIGURE 22.** Expected share of children aged 8 to 14 with foundational reading skills by whether there is a mismatch of language spoken at home and language of instruction, select countries
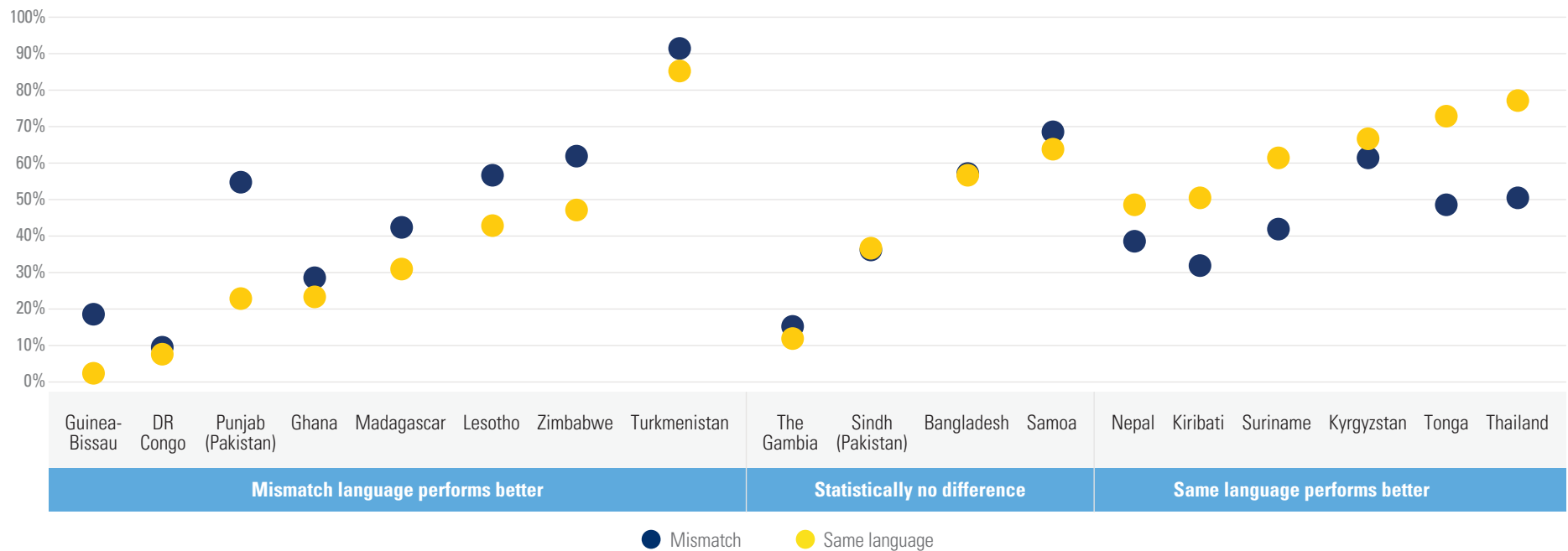


**Source:** Multiple Indicator Cluster Surveys Round 6 (2017-2021)

26. The regression analysis controls for gender, urban-rural location and school age as well as socio-economic status (wealth quintile).

# Learning loss estimation

As of this writing, more and more data are beginning to emerge on the impact of the COVID-19 pandemic on learning outcomes, and a number of simulations have also been carried out.[27] Thus far, studies documenting learning loss from a total of 34 countries, including those from higher and lower income groupings, have found on average an estimated four to five months of lost learning, along with increases in inequality.[28] Looking specifically at lower income contexts, one study in Pakistan revealed that the average student lost between 0.3 and 0.8 years of learning adjusted schooling[29], and in India, 92 per cent of students lost at least one specific language ability and 82 per cent lost at least one specific mathematic ability from the previous year.[30] On the basis of both these early findings and the simulations, it is reasonable to assume that prolonged school closures and other disruptions to the education system brought on by the pandemic have led to substantial learning loss.

The term "learning loss" is commonly used to describe declines in student knowledge and skills. Learning loss occurs when educational progress fails to occur at the same rate it has in previous years. There is some indication that younger students are more vulnerable than older students to learning loss as a result of the pandemic because young children are less likely to seek learning on their own because of their less advanced developmental and cognitive abilities.[31] Learning losses can be very difficult to regain, especially for young children who fall behind, because of challenges to reintegrating them into education systems, especially when these systems don't pay sufficient attention to those most at risk.[32]

In order to estimate what the learning loss to a year of disrupted schooling may be, pre-pandemic data are used to compare the learning outcomes of children in Grade 3 or above who do not attend school for a year, on average, to that of children who remain in school for that time period. Propensity score matching is used to ensure that the comparisons between the two groups are comparable for the purposes of the analysis, and to control for self-selection and sample bias, school dropout is used as a confounder for loss in foundational learning. Through this analysis, it is possible to get an idea of what the impact of not attending school for a year (a condition brought about by the widespread school closures due to COVID-19), could be on the attainment of foundational learning skills.



**Final-year students in class preparing for examinations. Students were provided with masks to help curb the spread of the virus. Schools across the country have also been equipped with hand washing facilities and contactless thermometers. Students also practice physical distancing while in class.**

© UNICEF/UNI357821/Buta

27. See for example: https://www.worldbank.org/en/topic/education/publication/simulating-potential-impacts-of-covid-19-school-closures-learning-outcomes-a-set-of-global-estimates
28. https://hpatrinos.com/2022/01/31/the-covid-19-slide-in-education-global-data-on-learning-loss/
29. Geven and Hasan (2020)
30. Azim Premji University (2021)
31. Learning loss during COVID-19: An early systematic review - Robin Donnelly and Harry Anthony Patrinos, 27 April 2021 Centre for Economic Policy Research (CEPA).
32. Drawn from UNICEF report on learning loss and school closures: Banerjee and Duflo, 2011; Glewwe et al., 2009; Muralidharan and Zieleniak, 2013.

Among 14 countries with suitable data for this analysis, the significant results for 12 countries clearly show that children who leave school on average for a year have lower rates of foundational reading skills than children who remain in school, with the median difference 15 percentage points. For the countries showing statistical significance differences, the range is 38 percentage points for a high in Pakistan (Punjab) to 5 percentage points for a low in the Central African Republic. In the case of Guinea-Bissau, Sierra Leone, and the Central African Republic, no children who have dropped out of school in the past year have foundational reading skills, while in Guinea-Bissau, for example, 24 per cent

of children who do not drop out have these skills. And in four other African countries, namely the Gambia, Ghana, Madagascar, and Zimbabwe, the share of children with foundational reading skills is at least 15 percentage points lower for those children who have dropped out of school in the last year, compared to those who remain in school.

So, what do these findings mean for a year of school closures and other disruptions to learning that have occurred during the pandemic? Missing school for a year will mean that foundational learning skills will likely decrease significantly. According to the analysis, with

everything else held constant, the share of children with foundational reading skills would drop by 68 per cent for those who leave school for a year. Given that only 30 per cent of children had foundational reading skills prior to the pandemic, this means that post-pandemic only about 10 per cent of children affected by a year-long school closure would have these skills. This signifies the urgent need to redouble efforts to make up for this period of learning loss. A potential solution is for education systems to invest more in remote learning so that children who have experienced prolonged disruptions in in-person instruction will be able to receive remedial support.

**FIGURE 23.** Share of children with foundational reading skills, comparing children who dropped out of school within the past year and children who remained in school
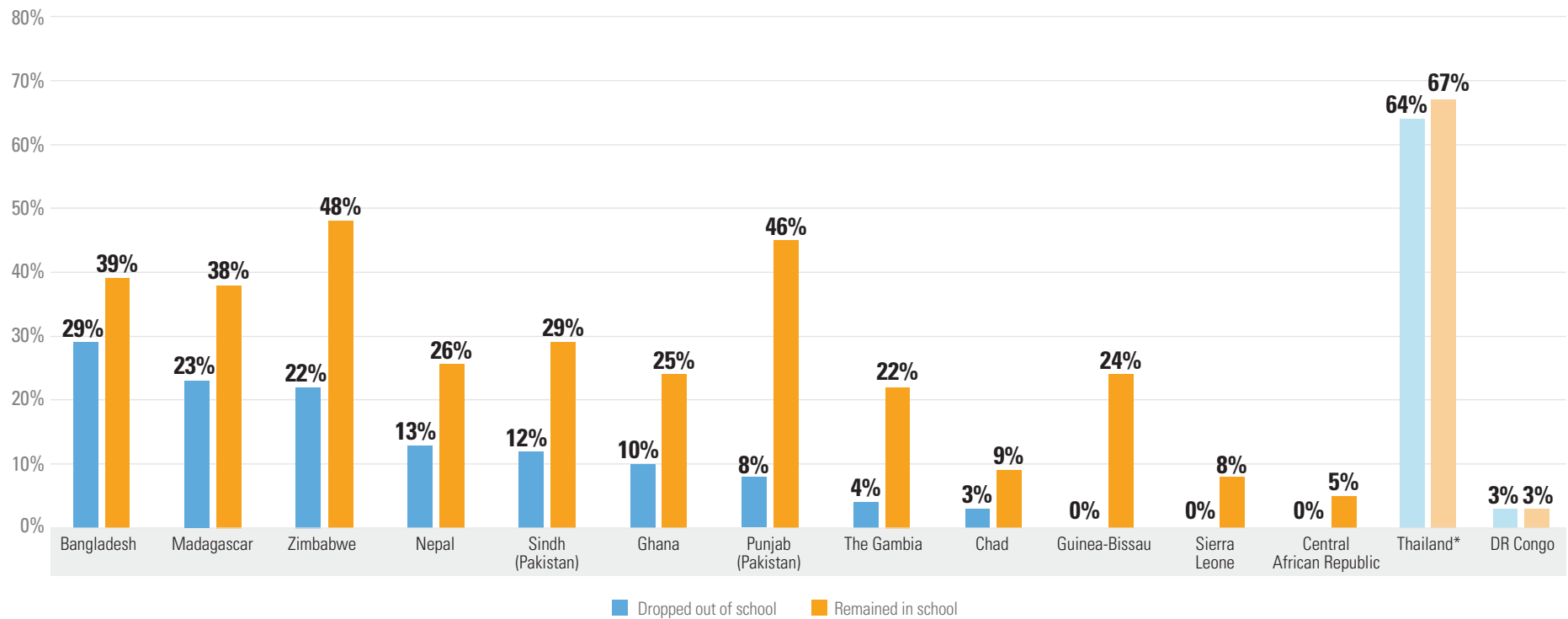


**Source:** Multiple Indicator Cluster Surveys Round 6 (2017-2021)

Note:
- Nonsignificant cases are displayed in a lighter colour.
- Countries with less than 50 observation of out-of-school children are suppressed. Countries that have a statistically significant gap in foundational reading skills between children who remain in school and children who leave school are shown with a darker colour bar.

# Long-term implications of learning loss

The pandemic and the resulting disruptions to the education system marked by widespread school closures are likely to have different impacts on different groups of children. Younger children in particular stand to suffer greater learning losses, especially over the long term. To examine potential long-term, accumulating learning losses arising from COVID-19 school closures, another simulation has been carried out using an existing model of the learning process. Two grade cohorts are compared, today's Grade 1 cohort and today's Grade 6 cohort, to differentiate the impact of school closures on younger and older children. In each case, the simulation estimates the reduction in the portion of children having foundational reading skills by the time they reach Grade 9, as a result of a full year of school closures. A more detailed explanation of the simulation is presented in the Annex.

The simulations suggest that for today's Grade 1 cohort, a full year's worth of learning loss during school closures could accumulate to a 27 percentage point

reduction in the share of children in the cohort demonstrating foundational reading skills by Grade 9, declining from 78 per cent to just 51 per cent. For today's Grade 6 cohort, the potential long-term losses are much smaller: 7 percentage points from a year's learning (dropping from 78 per cent to 71 per cent). Similar results are found for numeracy, with the Grade 1 cohort standing to lose 3 to 4 times as much learning in the long run as the Grade 6 cohort. The findings indicate that early grade cohorts have more years across which losses can accumulate, driven by a cycle in which students fall behind and the system fails to adapt, which leads to the children becoming unable to engage with the instruction, which causes them to learn less, and eventually fall even further behind. To put an end to this cycle, there needs to be a focus on normalizing differentiated approaches which respond to the learning needs of the child, built on formative and ongoing classroom assessments which allow for teaching children at their learning levels.

**FIGURE 24.** Modelling long-term loss in foundational reading skills from COVID-19 school closures and mitigation strategies

**Percentage of children with foundational reading by Grade 9 for today's Grade 1 cohort from varied mitigation approaches**
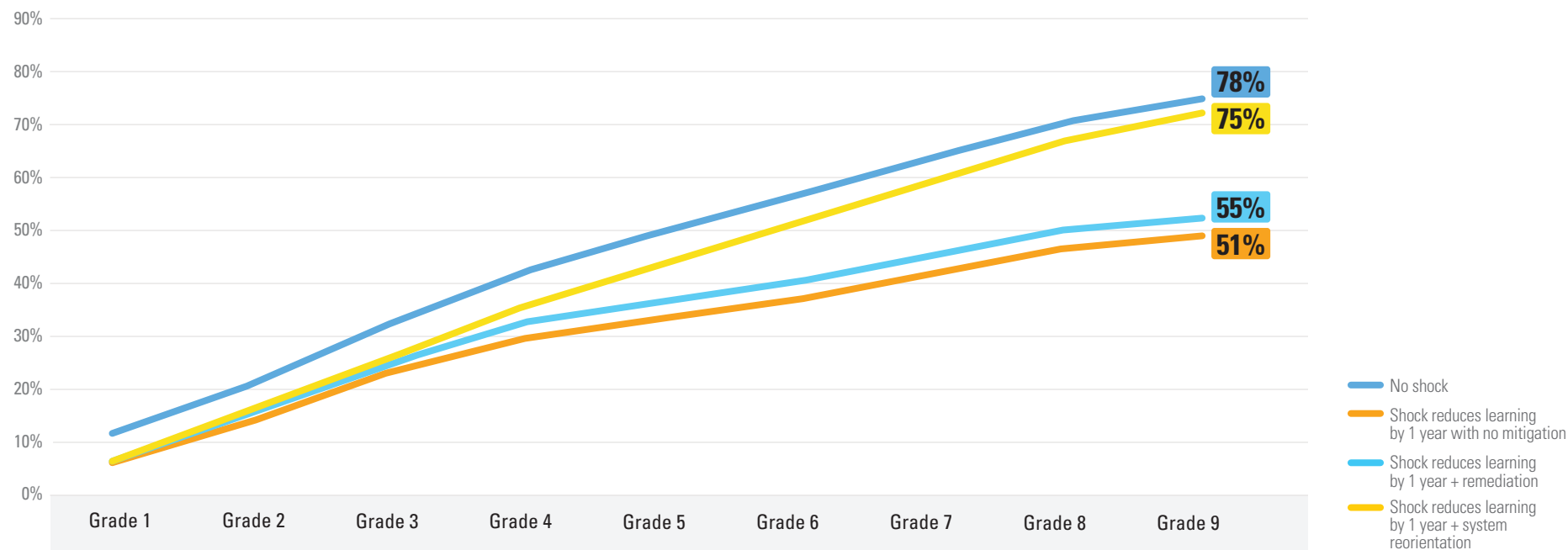


**Source:** Multiple Indicator Cluster Surveys Round 6 (2017-2021); RISE simulations

While the above simulations on learning loss coming out of the pandemic paint a disheartening picture, on a positive note, with the right mitigation strategies, much if not all of the learning loss can be recouped. To explore possible implications of different mitigation strategies, a simulation has been conducted of long-term learning losses resulting from one year of school closures under three different scenarios: if there is no mitigation strategy, if there is a remediation strategy, and if there is a system reorientation strategy. A remediation strategy entails taking the current curriculum and slowing the pace so that material can be reviewed for a year, after which regular learning resumes (this could be considered akin to curriculum repetition).[33] A system reorientation strategy requires teachers to adapt teaching over the long term, enabling children to catch up over time, rather than assuming this can be accomplished in a single year. Such a system reorientation approach is compatible with the Foundational Literacy and Numeracy (FLN) initiative and Mission Recovery, whereby the goal is for children to catch up on skills using targeted solutions set to scale, including efforts to meet children where they are by tailoring instruction to their individual level.[34] Once again, Grade 1 and Grade 6 cohorts are examined to delineate differences between younger and older children.

With one year's initial learning loss, the percent of today's Grade 1 students who will have foundational reading skills by Grade 9 drops by 27 percentage points to 51 per cent in the absence of any mitigation strategy. Implementing a remediation strategy

provides a small amount of recovery, as it raises Grade 9 foundational reading by 4 percentage points to 55 per cent. By contrast, long-term system alignment with children's learning needs as under system reorientation produces large potential gains, raising Grade 9 foundational reading skills to 75 per cent, nearly to where it would be had there been no school closures. The effects of each scenario follow a similar pattern but are smaller for today's Grade 6 students (with the initial drop to 71 per cent increasing to 73 per cent with remediation and to 78 per cent with system reorientation), signifying once again the importance of prioritizing younger children in efforts to recuperate learning losses.

Similar results are found for foundational numeracy skills. With no mitigation strategy, today's Grade 1 students would suffer a 20 percentage point drop in numeracy skills, down from 54 per cent to 34 per cent, by the time they reach Grade 9. Remediation provides very limited recovery from initial learning losses, with a small improvement to 37 per cent, but which still represents a 17 percentage point drop in skills. Long term system improvements to align instruction with children's learning levels, termed system reorientation, produces a large gain for today's Grade 1 students, to where they would nearly recoup all learning losses. More modest losses (from 54 per cent to 49 per cent) are followed by more modest gains (back to 54 per cent) due to system reorientation for today's Grade 6 students.

**FIGURE 25.** Modelling long-term loss in foundational numeracy skills from COVID-19 school closures and mitigation strategies

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**Percentage of children with foundational numeracy by Grade 9 for today's Grades 1 cohort from varied mitigation approaches**



**Source:** Multiple Indicator Cluster Surveys Round 6 (2017-2021); RISE simulations

33. Remediation is defined with specific focus on re-teaching the curriculum for the purposes of this simulation. This does not take into consideration other aspects of remediation, including changes to teaching strategies, support to learning, including learning at home, and increased use of assessment for learning.

34. More specifically, the FLN initiative uses the following approach: **Assessing** what children know, using simple, rapid, one-on-one, inexpensive tools to understand where children are in their learning; **Setting** short-term reading and arithmetic goals and assessing progress to take corrective action; **Building** on evidence-based FLN programmes, such as supporting teachers to meet children where they are by tailoring instruction to their level and in languages they understand; **Ensuring** a strong focus on remedial support to help children catch-up; Attending to the **wellbeing** of children, including activities and approaches that help to address the **mental health and psychosocial needs of children**; and Enhancing **school-home connections** by providing information to parents and caregivers and engaging them in at-home learning activities.

# Readiness to learn outside the classroom



**Deborah, 10, doing school assignments from home. She receives lessons and homework through the Distance Learning Programme - Ghana Learning TV - on television.**

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In March 2020, the COVID-19 pandemic brought a dramatic halt to in-person instruction, as about 150 countries fully closed their schools and another 10 countries partially closed them. Over the two years since the start of the pandemic, 147 million children missed at least half of in-person schooling, and of these, 25 million missed nearly all of in-person schooling due to school closures, amounting to 2 trillion hours of lost learning. Most of the students affected were from Latin America and the Caribbean, South Asia, and the East Asia and Pacific regions.[35] Widespread and prolonged school closures meant that schools had to quickly shift to distance learning. Distance, or remote learning could take on different forms, ranging from very low-tech options of distributing paper-based packets to children in their homes, to high tech options of using computers and the internet to deliver live instruction away from the classroom. In between options could include the use of radios, televisions, and mobile phones to broadcast education sessions. Among these options, computers and the internet can provide the closest means for emulating classroom settings, as it can allow for live interactions between the teacher and the students.

Although it is a goal of UNICEF in its Reimagine Education initiative to close the digital divide so that all children can access world-class digital learning, the fact remains that 1.3 billion children currently lack internet connectivity at home. As seen in the chart, it is primarily children aged 7-14 from the lowest income countries, most notably in sub-Saharan Africa, that have the lowest rate of internet access at home. These are also the countries that have the lowest share of children with foundational reading skills. Alternatively, the countries that have a higher rate of internet access at home tend to have a higher share of children with foundational reading skills.

The pandemic has brought some urgency to the need to address the digital divide, given the reliance on remote learning while schools were closed. But even after the pandemic ends and all schools are able to fully reopen, there is likely to be a permanent shift to more digitized and other forms of remote learning. This includes plans to deal with future crises that could necessitate school closures. Accordingly, sustained efforts are needed to increase internet access for all children, especially those in low-income countries and in remote areas where it is currently very limited. Furthermore, as digital learning materials and technology progress, attention must be paid to ensuring that they are accessible to learners with functional difficulties and other marginalized groups, and are also culturally and linguistically appropriate.

35. UNESCO Global monitoring of school closures

**FIGURE 26.** Share of children with foundational reading skills by internet access at home and by income status of the country



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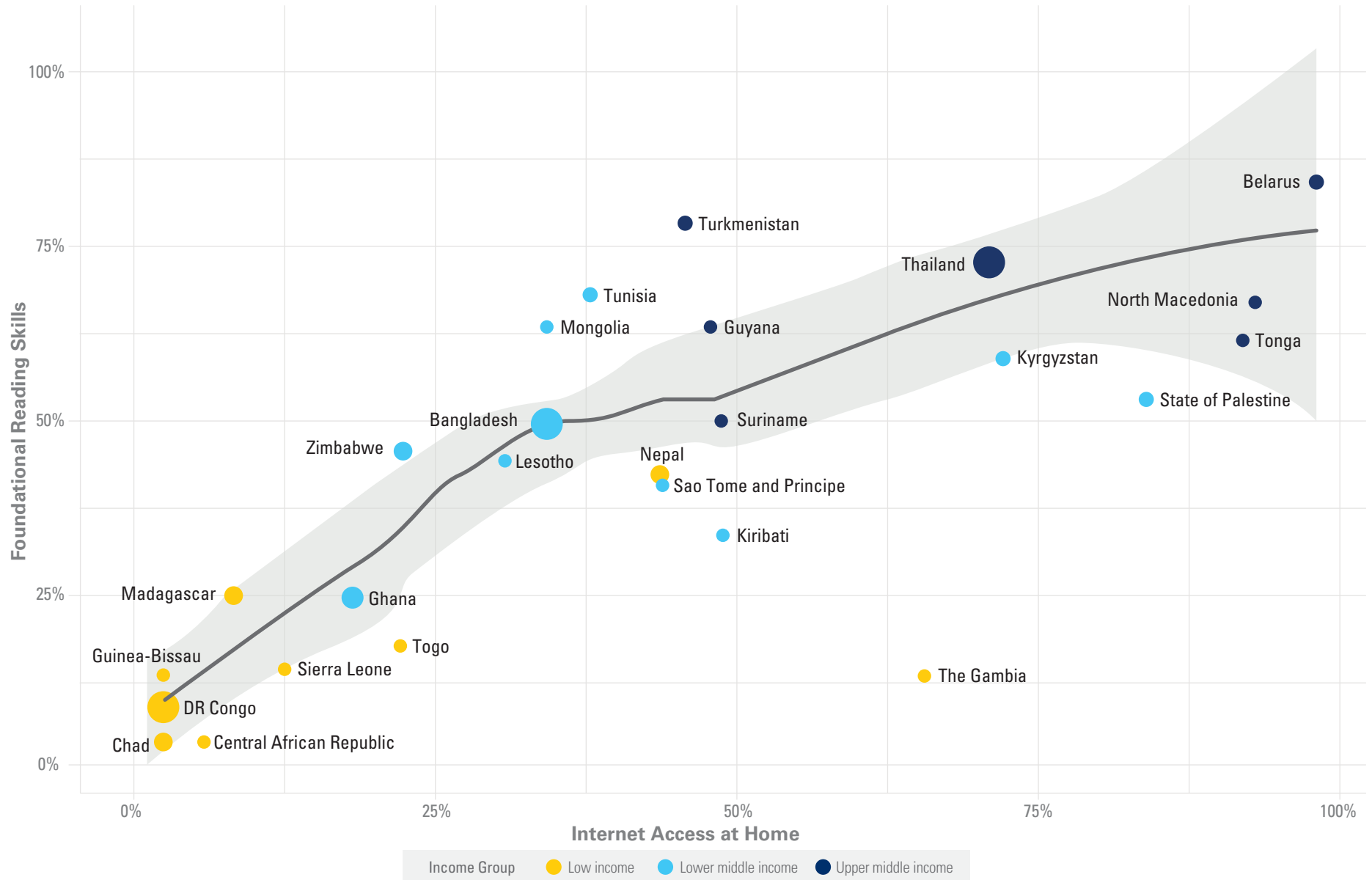
**Source:** Multiple Indicator Cluster Surveys Round 6 (2017-2021)

Note:
- The shaded area shows the 95 per cent confidence interval along the trend line.
- The size of the circle represents the country's relative population.

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James B Arthur, a Circuit Supervisor with the Ghana Education Service, stepping in to teach a geometry class during the regular teacher's absence at Ayensudo Islamic School in the Central Region of Ghana on 22 May 2015. A visit to schools in Elmina, Central Region.

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# Key messages
# and Conclusions

## MICS data reveal the depths of the learning crisis, especially in Africa

The MICS foundational learning module data certainly confirm that there is a learning crisis. Among a sample of children who are attending Grade 3 in the 31 countries and territories for which data are available fewer than one in three (30 per cent) children have foundational reading skills, and fewer than one in five (18 per cent) have foundational numeracy skills.

The situation is most dire for children in sub-Saharan Africa where in many instances fewer than one in 10 children attending Grade 3 possess these foundational skills. As alarming as the situation is for children who are attending school, the true picture is even more concerning when out-of-school children are taken into account, as being out-of-school can result in a

complete lack of foundational learning skills. Although the ability of children to read, write and have basic numeracy is essential for them to thrive in the 21st century economy, most children are not acquiring these fundamentals at the point they should, and some may never acquire them.

## Wealth inequality is a major determinate of foundational learning skills attainment

Wealth inequality is among the greatest drivers of the learning crisis, as evidenced both between countries and within countries. Middle-income countries, such as Belarus and Turkmenistan, outperform low-income countries in sub-Saharan Africa in the share of children with foundational learning skills by more than 70

percentage points in some cases. Within countries, the gap in learning between children from poor households and children from wealthier households is notable, although in most countries foundational learning skills remain low for all children, regardless of household income. This signifies the need for

greater investment in policies that promote equity in learning, as well as the importance of generating additional resources or targeting existing resources to raise the level of foundational learning skills for all children, with particular attention to serving the most vulnerable.

## But factors aside from wealth and income are important as well

Although wealth is the most pronounced, there are other factors that are also associated with the attainment of foundational learning skills, including parental involvement in their children's education and the home environment. The probability of children having foundational reading skills decreases by 6

percentage points for children whose parents do not attend meetings at their child's school. Similarly, when families do not have child-oriented books in the household, foundational reading skills decrease by 8 percentage points. This may speak to the need to assist parents in actively participating in school

activities related to their children's learning, as well as creating a supportive learning environment at home for their children. When parents fully appreciate the value of education, they may become more engaged and invested in their children's learning, which can bring an added benefit of improving learning outcomes for their children.

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## Moving closer to the goal of foundational learning skills on time (by Grade 3) will require speeding up the **pace of learning**

Children need quality instruction to support and reinforce their learning. Among the elements of quality education are having appropriate curricula and teaching and learning materials, a pedagogical approach that meets the needs of children, teacher training, teacher support, and formative assessment. In the absence of these components to a quality education, at current rates of learning, children would have to spend between seven and 11 years in primary school to acquire foundational reading and numeracy skills they should be able to master by

the time they complete Grade 2. In order for more children to have foundational learning skills by the time they enter Grade 3, instead of acquiring these skills in higher grades, more investment needs to be made in both early childhood education and early grade learning. The cost to the education system of children delaying the acquisition of foundational learning skills until later grades – when they should have moved on to more complex material – is high and can be avoided if more learning takes place in the early grades.

An appreciation for the value of education, coupled with high quality instruction, can translate into children learning more and remaining in school for a longer period of time. Although the data clearly show that the longer children stay in school, the greater the likelihood of their having foundational learning skills, the slow pace of learning is equally evident. Therefore, in tandem with efforts to reopen, and keep open schools that have been closed because of the pandemic, attention must be paid to improving the quality of instruction so that all children can realize their goals as they advance in their learning journey.

## **Marginalized** groups of children deserve particular attention

Every child has a right to an education, regardless of sex, disability status, language, or work responsibilities, but differences among groups of children persist, particularly among the most marginalized. While girls may have an edge over boys in foundational reading skills, with the median gap about 6 percentage points, the findings are more mixed with respect to foundational numeracy skills. Overall, learning levels remain low for both girls and boys, signifying that interventions are needed to improve learning for all children, without a particularly focus on gender.

Although children with functional difficulties are attending school in roughly the same proportion as children without these difficulties, the likelihood of their

having foundational reading and numeracy skills is lower for children with communication, learning, and remembering difficulties. These children may need extra support or accommodation to sustain them in their individual learning journeys, including making education systems more proactive in identifying and removing barriers to participation, such as through the adoption of principles of universal design for learning in their pedagogy and ensuring child-centred instruction.

Accommodations for learning may also involve the language of instruction, particularly if children speak one language at home and are taught in a different language at school. Most essential is

that children are able to learn in a language that they understand. Accordingly, early grade learning should be particularly sensitive to meeting children's language needs, especially among children from minority groups.

Perhaps the most marginalized children with respect to learning are those who are poor, engaged in child labour, and out of school, as many of these children are simply not learning at all. Children need to be in school and given the opportunity to learn, rather than being cut off from schooling because they are forced to work. Providing support to families to ease their financial stress could be one way to enable parents to choose education over work for their children.

## Efforts are needed to **recoup lost learning** from the pandemic

The prolonged school closures and other major disruptions to the education system brought about by the pandemic have no doubt exacerbated the learning crisis. Simulations comparing the impact of a year of school closures on different age cohorts of children reveal that younger children are at risk for more substantial and sustained learning loss than older children. A child currently enrolled in Grade 1 could suffer a 27 percentage point reduction in reading mastery by Grade 9. As schools reopen, efforts to recoup lost learning should focus on providing initial, rapid support upon which larger reforms can be built that allow children to catch up over time and learn at the right level, rather than a strategy that only focuses on the first months or year after returning to school. Solutions that could work quickly and at scale include formative assessments, tailored instruction to meet children's needs, and parental engagement. If effective learning recovery strategies are introduced, both younger and older children can be expected to regain nearly all of their lost learning by the time they reach Grade 9.



**Young students laugh on their way back from school.**
© UNICEF

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## The way ahead

In the years ahead, education systems need to intensify their efforts to not only help children recoup lost learning resulting from the pandemic, but make strides to substantially improve learning outcomes such that all children can acquire foundational learning skills in the early grades. That's why UNICEF, together with UNESCO and the World Bank have launched

Mission: Recovery Education, with the three priorities of bringing children back to school, implementing catch-up learning initiatives, and preparing and supporting teachers. Tandem efforts include UNICEF's Foundational Literacy and Numeracy (FLN) initiative, the World Bank/UNICEF Accelerator programme, and the Learning Data Compact, which are meant to support and accompany

governments in "building forward better" and to make positive change in children's foundational learning. Through these efforts, reinforced by government initiatives to tackle the learning crisis, children can get back on track to learning and acquiring essential skills. We know what to do, we simply need to start doing it!

Iram Akmal, a trained ECE teacher conducts Math class with the help of learning material in UNICEF supported Early Childhood class (ECE) in Government Community Model Elementary School, Dari Ali Akber Sanghi, Rahim Yar Khan district, Punjab province, Pakistan.

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# ANNEX 1:
# Education indicator calculation methods

Every MICS survey contains a series of questionnaires, each of which focuses on one specific age group. The calculations in this report are based on the questionnaires administered to children aged 5–17 years-old. Each MICS questionnaire contains several modules. This questionnaire provides the data for calculating learning levels (SDG4.1.1.a), but also information on child functioning (SDG4.5), parental involvement, positive and stimulating home environment (SDG4.2.3), and child labour (SDG 5.3.1). It is therefore useful for both education related information and cross-sectoral analysis. This questionnaire also gathers a wealth of data on children's characteristics that can be used to understand disaggregated education attendance, completion and learning by various characteristics.

The development of the Foundational Learning module, in particular, has been a cutting-edge initiative to assess children's reading and numeracy skills through household surveys, which includes both children who are in school and out of school. The module can be used to monitor SDG 4.1.1 – Proportion of children and young people (a) in Grade 2 or 3; (b) at the end of primary education; and (c) at the end of lower secondary education achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex.

Learning outcomes are key indicators of quality education as they provide evidence on whether schools are equipping children with the foundational skills needed for success. In the Foundational Learning module of MICS6, children are asked a series of questions to measure whether they are achieving minimum foundational skills in reading and numeracy in Grade 2/3.



**Foundational reading skills are divided into three categories:**

**1. word recognition**
correctly reading 90 per cent of words in a story

**2. literal questions**
replying correctly to all three literal questions

**3. inferential**
replying correctly to both of two inferential questions

If the child succeeds in all three tasks, they are considered to have foundational reading skills.



**Foundational numeracy skills are divided into four tasks:**

**1. number reading**

**2. number discrimination**

**3. addition**

**4. pattern recognition**

Each task is composed of several questions and the child must correctly answer all questions to successfully complete the task. If the child succeeds in all four tasks, they are considered to have foundational numeracy skills.

### $\text{A}_\text{B}{}_\text{C}$ Calculation of reading skills

**The variables used to assess children's foundational reading skills are:**

- FL19W is a set of numbered questions (FL19W1, FL19W2, FL19W3…) that allows for the calculation of the number of words read correctly in a reading exercise. For example, if a child correctly reads 6 words, then FL19W6 will be equal to 1, otherwise it will be blank or equal to zero.

- FL22A, FL22B, and FL22C are binary variables which represent the three literal questions to indicate if the child successfully answered each of the questions.

- FL22D and FL22E are binary variables which represent two inferential questions to indicate if the child successfully answered each of the two inferential questions.

**The following calculation is used:**

$$\text{readsk}=1 \text{ if (read\_corr=1) \& (alit=1) \& (alnfe=1), otherwise } 0.$$

**Where:**

- readsk represents a binary variable for foundational reading skills, equalling 1 when a child has foundational reading skills and 0 otherwise.

- corr is a binary variable where 1 represents success in reading 90 per cent of the words in a story correctly, calculated using FL19W.

- alit is a binary variable where 1 represents success in responding correctly to three literal questions, calculated using FL22A, FL22B and FL22C

- alnfe is a binary variable where 1 represents success in responding correctly to two inferential questions, calculated using FL22D and FL22E

$$FRS_{ng} = \frac{readsk_{ng}}{T_{ng}}$$

**Where:**

- $FRS_{ng}$ = share of children aged n and attending a school grade g who have foundational reading skills

- $readsk_{ng}$ = children aged n and attending a school grade g who have readsk equal to 1 according to the formula above

- $T_{ng}$ = total number of children aged n and attending school grade g

It is worth noting that the indicator can be calculated for any age group or for all age groups (data are collected for children aged 7 to 14 years old). Furthermore, the indicator can be calculated for children of a given age group (or all age groups) who are attending a particular grade.

## 123 Calculation of numeracy skills

Applying the explanation above, the variables used to assess children's foundational numeracy skills are as follows. Each domain of numeracy skills has multiple questions which are listed with capital letters (e.g., A, B, C):

- FL23 (A, B, C, D, E, F) = 1 if the child correctly responded to a number reading question

- FL24 (A, B, C, D, E) = 1 if the child correctly responded to a number discrimination question

- FL25 (A, B, C, D, E) = 1 if the child correctly responded to addition questions

- FL27 (A, B, C, D, E) = 1 if the child correctly responded to pattern recognition questions

**The following calculation is used:**

$$\text{numbskill}=1 \text{ if (number\_read=1) \& (number\_dis=1) \& (number\_add=1)}$$
$$\text{\& (number\_patt=1), otherwise 0.}$$

**Where:**

- numbskill shows children with foundational numeracy skills

- number_read is a binary variable, where 1 represents children correctly answering all the number reading questions, calculated using FL23 (A, B, C, D, E, F)

- number_dis is a binary variable, where 1 represents correctly answering all the number discrimination questions, calculated using FL24 (A, B, C, D, E)

- number_add is a binary variable, where 1 represents correctly answering to all the addition questions, calculated using FL25 (A, B, C, D, E)

- number_patt is a binary variable, where 1 represents correctly answering to all the number pattern tasks, calculated using FL27 (A, B, C, D, E)

$$FNS_{ng}= \frac{numbskill_{ng}}{T_{ng}}$$

**Where:**

- $FNS_{ng}$ = the share of children aged n and attending school grade g who have foundational numeracy skills

- $numbskill_{ng}$ = children aged n and attending school grade g who have numbskill equal to 1 according to the formula above

- $T_{ng}$ = total number of children aged n and attending school grade g

It is worth noting that the indicator can be calculated for any age group or for all age groups (data are collected for children aged 7 to 14 years old). Furthermore, the indicator can be calculated for children of a given age group (or all age groups) who are attending a particular grade.

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**Altai, Gobi-Altai province, Mongolia - September 13, 2018: Boy with special needs reading a book in his house, in Altai, Gobi-Altai province, Mongolia. UNICEF has developed a signal language book for deaf-mute children. He is a student at General Education School #3 in the city of Altai.**

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## ANNEX 2:
# Regression analysis

Many charts in this report present descriptive statistics, which use the formulas above for specific groups. For example, Figures 6 and 7 calculate the above indicators filtering off children in and out of school. However, other figures carry out more complex analysis, in particular logistic regressions. The idea behind such regressions is that several characteristics of a child are put together to explain one phenomenon, for example attendance or learning. The analysis will then identify, among these characteristics, which ones are significantly correlated to the phenomenon they are trying to explain and what the magnitude of their explanatory power is. The first regressions in figures 8 and 9 show what are the most powerful characteristics impacting children's learning.

Figures 19 and 20 also present logistic regressions, but the model differs slightly by including specific domains of functional difficulties. Each bar shows one separate regression result where learning is explained by control variables (in this case age, sex, grade, location, wealth quintile and mother's education), but also including a child functioning domain.

# ANNEX 3:
# Projection of years of schooling

Figures 14 and 15 also present more complex calculations. These figures show the projection of years of schooling needed for children in primary school to reach a threshold of 70 per cent having foundational skills. The calculation considers the average percentage gain of children learning in primary education. For example, in a country where primary education lasts for 5 years and the percentage of children with reading skills in Grade 1 is 10 per cent and in Grade 5 is 60 per cent, that means that, on average, every year of primary education increased in 10 percentage points the share of children with foundational reading skills. The formula below explains:

$$AL = \frac{S_1 - S_n}{N}$$

**Where:**

- $AL$ = the average learning in primary education

- $S_1$ = the share of children with foundational skills in Grade 1 of primary education

- $S_n$ = the share of children with foundational skills in Grade N (the last grade) of primary education

- $N$ = the number of grades in primary education

Going back to the hypothetical example, to reach the 70 per cent benchmark, the country would need to increase 60 percentage points starting Grade 1, where only 10 per cent of children have foundational reading skills. At the rate of 10 percentage points a year, this means that it would take six years of schooling for the country to reach the 70 per cent benchmark. This reasoning is explained by the formula below:

$$PY = \frac{70\% - S_1}{AL}$$

**Where:**

- $PY$ = the projected number of years of schooling needed for children in primary school to reach threshold of 70 per cent having foundational skills

- $S_1$ = the share of children with foundational skills in Grade 1 of primary education

- $AL$ = the average learning in primary education calculated by the formula above

**Students at Hassaniya Primary and Junior High School in Tamale in the Northern Region of Ghana on 12 Nov 2015.**

# ANNEX 4:
# Simulating impact of school closures on foundational reading skills

For simulating the impact of school closures with duration of one year on average on the acquisition of the foundational reading skills, we used propensity score matching. This approach allowed us to estimate the hypothetical impact of schools being closed on average for one year on how far the children will fall behind in their education in the quasi-experimental and counterfactual fashion. The results of the analysis are presented in Figure 23 of the report and look at the children of primary school age who completed at least Grade 3 of primary school. In other words, the analysis is narrowed to children who are of primary school age, completed at least Grade 3, and either are still attending school or dropped out of school, with the average duration of the drop out accounting for approximately a year. As such, drop out is used as a treatment variable to estimate the propensity score and allowing to understand the difference in the learning outcomes of the children who attend school and, by comparison, children who miss out on a year of school, on average. The treatment variable was predicted by the set of confounders that include sex, latest grade attended, socio-economic status (wealth quintile groups), area of residence, and country. On the next stage, when every child in the treatment group was matched with children in the control group using a nearest neighbour matching technique, the average share of children with foundational reading skills by the drop out status was compared across 14 countries to estimate if the difference in skills is statistically significant. This approach allowed to understand how far the children who miss out on a year of schooling fall behind in their foundational reading skills.



**A student pays attention to the teacher inside the classroom at Gandaria Mohila Shomity Government Primary School, Dhaka, Bangladesh on 12 September 2021.**

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# ANNEX 5:
# COVID learning loss simulations methods

Even before the COVID-induced school closures, the majority of children in the majority of countries with MICS6 data were behind grade-level instruction. As shown in Figures 4 and 5, in most countries more than half of the children attending Grade 3 lacked Grade 2 level reading and numeracy skills. Learning losses during COVID-19 school closures will exacerbate this mismatch between instructional level and children's learning level.

If children do not receive adequate remediation to help them catch up, they could continue to fall further behind even after they return to school. Accumulating learning losses have been documented in other natural disaster scenarios. Following the 2005 earthquake in Pakistan, children affected by the earthquake missed an average of 14 weeks of school due to school closures (Andrabi et al., 2020). Four years later they were two years behind in learning compared with similar children who had not been affected. The children's time out of school was insufficient to explain the scale of their learning losses, indicating continued learning loss even upon returning to school. The authors of the study concluded that the most likely explanation is that because the children were behind the level of instruction when they returned, they continued to fall further behind over time.

To model the potential long-term learning losses that could result from COVID-induced school closures, this paper used an existing pedagogical production function (PPF) model described in Kaffenberger & Pritchett (2021) and applied to COVID learning losses in Kaffenberger (2021). Kaffenberger & Pritchett (2021) calibrated the model to replicate typical learning trajectories in low- and middle-income countries.[37] The model includes 6 parameters: shape (or functional form), width (the range of student abilities that learn under the PPF), height (the amount a child under the PPF learns in a year of school), slope (the gradient of learning across the student distribution), center (the ability level on which the PPF is centred), and pace (the amount the PPF shifts up with each grade level progression). The calibrated PPF simulates the learning that children at each point in the initial skills distribution achieve in each year of schooling.

The calibrated PPF has two distinct features. The first is that the PPF has a range of initial skill levels within which children learn, and above and below which they do not. If the instructional process is too advanced (e.g., teaching division to children who cannot recognize numbers) or too rudimentary (e.g. teaching number recognition to children ready for long geometry), the children will not gain new skills from that instruction. The second is that the PPF has at trapezoidal functional form with a slope parameter, so that learning can vary across the initial student distribution. In line with the learning profiles literature, the calibrated PPF has a positive slope, so that high performers learn more per year than low performers.

To simulate long-term learning losses from the COVID-induced school closures and compare implications for younger and older children, we used this model to introduce a shock for today's Grade 1 and Grade 6 students. We model a shock scenario for each cohort, informed by emerging data on the severity of initial learning losses children have experienced during school closures: an initial loss equivalent to a full year's worth of learning. For each grade level and shock scenario, we simulate learning trajectories and outcomes through Grade 9 (in keeping with the highest grade assessed by MICS6 data). In these scenarios, we assume children re-enter business-as-usual schooling, with no adaptations to instruction to account for the periods of school closures.

We then simulate possible policy approaches to mitigate learning losses. We first simulate a short-term, remediation scenario. This assumes the material children missed while out of school will be covered as part of regular instruction in the year they return to school. In the model, this is enacted by slowing the "pace" parameter.[38] However, the time needed for remediation crowds out some of the time for new topics, so learning losses are partially but not fully compensated.

The second mitigation scenario is a long-term system reorientation scenario. This scenario simulates a broader curriculum and instruction reform that better aligns instruction with children's learning levels on a long-term basis, such as through approaches described in Hwa, Kaffenberger & Silberstein (2020). This scenario assumes education systems implement remediation, as in the first scenario, in the year children return to school. Then, in all subsequent years, the pace of curriculum and instruction are adjusted to better track with the pace of children's learning, meaning that more children continue learning for longer and fewer children fall behind the level of instruction on an ongoing basis. More details on the model, calibration process, and simulations are available in Kaffenberger & Pritchett (2021) and Kaffenberger (2021).

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36. The learning-profiles literature that informed the calibration is summarized in Kaffenberger & Pritchett (2021), and includes cross-country variation in learning profiles (Kaffenberger & Pritchett, 2020; Muralidharan and Singh, 2019; Pritchett and Sandefur, 2020); within-country variation in learning profiles (Akmal and Pritchett, 2019); the limited range of learning levels that gain from a given level of instruction (Beatty et al., 2021; de Hoyos et al., 2019); and the role of instructional alignment in learning profiles (Banerjee et al., 2007; Banerjee et al., 2016; Büchel et al., 2019; Duflo et al., 2011; Glewwe et al., 2009; Muralidharan et al., 2019).
37. More details are provided in Kaffenberger (2021).

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# ANNEX 6:
# Sample questions from MICS foundational learning skills module

## Reading

The child is asked to read aloud the following:
**Sam is a cat. Tina is a dog. Sam is 5. Tina is 6.**

Once the reading is done, the child is asked:
**How old is Sam?**
**Who is older: Sam or Tina?**

The child is asked to read the following story:
**Moses is in class two. One day, Moses was going home from school. He saw some red flowers on the way. The flowers were near a tomato farm. Moses wanted to get some flowers for his mother. Moses ran fast across the farm to get the flowers. He fell down near a banana tree. Moses started crying. The farmer saw him and came. He gave Moses many flowers. Moses was very happy.**

The child is asked several questions about the story.
**What class is Moses in?**
**What did Moses see on the way home?**
**Why did Moses start crying?**
**Where did Moses fall?**
**Why was Moses happy?**

The child is asked to read aloud the following:
**John is a boy. Anne is a girl. John has 2 eggs. Anne has 3 eggs.**

The child is then the following questions.
**How many eggs does John have?**
**Who has more eggs: John or Anne?**

The child is asked to read the following story.
**Mary is seven years old. One morning, her grandmother sent her to the market to buy carrots. She gave Mary some money. Mary put it in her bag. The bag had a big hole. On the way, Mary lost the money. Peter saw the money and gave it to Mary. She was happy. Mary thanked Peter and walked to the market.**

The child is asked the following questions about the story:
**How old is Mary?**
**Who sent Mary to the market?**
**What was Mary asked to buy?**
**Why did Mary lose the money?**
**Why was Mary happy?**

## Numeracy

The child is asked to identify different numbers.
The child is asked which of two numbers is bigger.
The child is asked to sum two numbers.
The child is shown a number pattern, with one missing number. The child is asked for the missing number in the pattern.
**1, 2, __, 4**
**5, 10, 15, ___**