PAL NETWORK
People's Action for Learning

ICAN

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International Common Assessment of Numeracy

Background, Features and Large-scale Implementation

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Foreword

I am happy to write a foreword for this report, which is as timely as it is important.

Measuring skills globally remains insufficient with frustratingly little knowledge of learning in many countries and regions within countries. The evidence we do have shows that children around the world are not learning enough to improve their own and their nations' and communities' lives. The UNESCO Institute for Statistics (UIS), which I lead, has estimated that 674 million children and adolescents are not achieving minimum proficiency levels (MPLs) in reading and mathematics. Moreover, scholars in our network have estimated that, relatively speaking, children in low- and lower-middle income countries are considerably more behind their OECD peers in learning than in access and entry to school, or even progression. However, it is hard to address this situation without less top-down and more granular measurements of learning.

Foundational learning is extremely important, since - by definition - it lays the foundation for everything else. It also is a fertile area for improvement, because the techniques for improving foundational skills are better known than the techniques for improving learning in, say, secondary schools in more qualitative subjects such as history or social studies, hugely important as those are.

The issue of foundational learning is particularly resonant today amidst the COVID-19 crisis, as foundational skills are known to be the easiest to lose when schooling is interrupted, as is evident from studies of learning loss during vacations. They are also the hardest to regain once schooling re-starts. Therefore, measurement of such skills is key to develop adequate responses to future emergencies, such as pandemics, refugees and migrants crises, etc.

Against this background, the measurement that ICAN offers and PAL Network has done previously, is useful for various reasons. Firstly, it can raise awareness among policy-makers, especially if the measurement is quite concrete and relatively easy to understand. Secondly, if analysed together with other data sources, it can help understand reasons for insufficient learning and design ways to deal with it. Thirdly, if the measurement has a head-teacher equivalent (or such a thing can be developed) for formative needs, or is easy to implement, it can be used to target interventions to particular districts, schools or even classrooms. In any of these contexts it can link to curricular standards and help set practical, achievable benchmarks. Finally, it can be used, in the happiest of cases, to track progress and take justified pride in achievement and defend the budget of the education sector in discussions with Ministries of Finance.

The ICAN assessment tool is open-source, robust and simple to use. It is available in 11 languages. It was developed through a collaborative effort between PAL Network member organisations in 13 low- and middle-income countries across Africa, America and Asia. Considering that COVID-19 has pushed millions of children further away from schooling, I believe that this is an opportune time to re-invest in foundational learning. PAL Network's ICAN is a start.

Since the UIS is the repository, standards-setter, and coordinator for SDG 4.1.1 (a) as well as for other education levels, I particularly appreciate how the ICAN tool can be used for policy-linking with other assessments, such as PASEC, as discussed in the UIS Webinar on SDG 4.1.1 Measurement Tools - Applications in the Wake of COVID-19 in June 2020. The UIS is working with partners on tech-enabled pilot programs to increase the assessment of foundational learning throughout our communities. And I am very pleased to acknowledge that ICAN has strived, from the get-go, to align as much as possible, thus offering international comparability of results aligned to SDG 4.1.1 (a).

To sum up, I am truly excited to see this effort, and to warmly endorse its results.

July, 2020

Silvia Montoya

Director, UNESCO Institute for Statistics

Preface

It is with great pleasure that the PAL Network releases the International Common Assessment of Numeracy, or simply ICAN. In many ways, ICAN is much more than an assessment.

ICAN is the fruition of a story that began in Pratham, in India, with a group who designed a large-scale household-based assessment to measure foundational learning outcomes in reading and math. These individuals must have been driven by the mantra that 'I CAN do something'. Their singular purpose led to the genesis of the Annual Status of Education Report (ASER) and its citizen-led approach. This is an approach that Pratham willingly shared with many countries and in so doing bequeathed to other PAL Network members a novel yet practical approach suitable for measuring learning outcomes in similar contexts across Africa, America and Asia. The core tenets, that assessments are done in the households, one-on-one, using a simple-to-use tool, remain trademark features of ICAN.

ICAN demonstrates that organisations across continents and countries can forge meaningful connections to develop a common public good. PAL Network members are compelled to collectively respond to the global call articulated in SDG 4.1.1 that 'children and young people…achieve at least a minimum proficiency level in reading and math'. One of the key contributions we make is to generate evidence on learning outcomes using the citizen-led assessment approach. We recognised that it was not enough to do similar work across network members, we needed to take further steps that would allow the network to generate comparable data. A milestone that paved the way for this realisation was the creation of PAL Network's Data Quality Standards. These internal standards were developed in a participatory manner, informed by other global good practices. These standards guided the design and implementation of ICAN, enabling us to assemble robust evidence that can inform us, using the lens of numeracy, about the extent to which we are on course in ensuring that all children are learning the basics. Even as we release ICAN, its sister assessment of foundational reading is under development.

We release the ICAN report at a unique moment in history. Many school systems have been paralysed due to the effects of the coronavirus disease of 2019 (COVID-19). While some households, schools and countries have been able to re-organise themselves, the usual regions and populations remain shut out of remote and blended learning options. It is a stark reminder of how inequitable society is. It is therefore essential that we seek to include those at risk of being left behind. The ICAN tools and processes are worth emulating for a variety of reasons: first, the tool is simple to use and inviting to non-specialists including parents; second, the approach is designed for scale as huge numbers of volunteers can easily be trained to conduct the assessment and provide the evidence we all need; third, by being implemented in the household, the process includes all children and does not discriminate according to schooling status or school type; and finally, earlier barriers like language of assessment have been partially resolved: ICAN was implemented across 11 languages. If we are to reach all children, we need to emulate inclusive processes like the ICAN approach.

Ultimately, ICAN communicates the aspiration we have for each child, who ought to be able to proudly state: 'I can do math' or 'I can read'. The evidence communicated in this report confirms the continued presence of children in many Global South communities who, despite many years of schooling, remain innumerate. As the clock ticks to 2030, the target year to ensure that all children have acquired at least the basics, we can use the evidence presented to reflect and energise our approaches to ensure that each child has a good foundation that can assure them meaningful learning outcomes.

Sara Ruto

Chief Executive Officer, PAL Network

Contents

Acknowledgements

ICAN is the product of a South-South collaboration between 13 PAL Network member organisations, local district level partner organisations in participating countries, the PAL Network Secretariat, numerous colleagues, supporters and friends of citizen-led assessments.

We are thankful to all PAL leaders for their guidance and participation in ICAN, and for sharing the individual messages that have been included in this report.

We are immensely thankful to Suman Bhattacharjea who guided the development of this report. We are also indebted to Wilima Wadhwa for providing sampling and statistical guidance for ICAN. Data analysis for this report was implemented by Steffi Thomas, Waqas Imran and Suraj Kumar. Several PAL leaders provided feedback on the earlier draft, their support in improving this volume is gratefully acknowledged. Hannah-May Wilson contributed to several sections of this report. Avital Datskovsky provided editing support. Sanjeev Sharma and Prakriti Saha designed the report.

The ICAN project was led by PAL Network's Assessment Working Group. We are immensely grateful to the ICAN Project Management Team members in the 13 countries for their tireless efforts, which enabled the seamless implementation of the ICAN project. They are: Gopal Dey, Aurin Huq, Falguni Reza and Sunjida Rahman (Bangladesh); Vikram Guria and Sudipto Kar (India); Francis Njuguna (Kenya); Bréhima Traore and Adama Danioko (Mali); Ana Karen Espinoza Morales and Ricardo Picie Hernández (Mexico); Lino Garcia Andre (Mozambique); Pramila Bisunke and Samjhana Balami (Nepal); Maribel Ochoa and Arline Calderón (Nicaragua); Bridget Azubuike and Gbenga Quadri (Nigeria); Sahar Saeed and Muhammad Fiaz (Pakistan); Soufianou Moussa and Kaba Diakhaté (Senegal); Richard Temu and Benjamini Masebo (Tanzania); and Ismail Sentamu, Faridah Nassereka and Judith Nyakaisiki (Uganda).

ICAN was implemented in one rural district in each of the 13 participating countries. In most cases, a local partner organisation supported the implementation of ICAN. We gratefully acknowledge the participation of: Rural Reconstruction Foundation (RRF) (Bangladesh); Jai Narayan Sarvodaya Vidyalaya (India); Mwala Youth Team Initiatives (Kenya); Samriddha Samaj (Nepal); Escuela Normal José Martí, Matagalpa (Nicaragua); Health and Sustainable Development Association of Nigeria (HESDAN) (Nigeria); Society for Human Development (SHD) (Pakistan); Forum Civil-Section Thiès (Senegal); Jivunie Elimu Bora (Tanzania); and Children And Wives Of Disabled Soldiers Association (Uganda). The ICAN assessment was implemented by locally mobilised field enumerators in Mali, Mexico and Mozambique. Many thanks are also due to all the District Coordinators and field enumerators without whom ICAN's implementation would not have been possible.

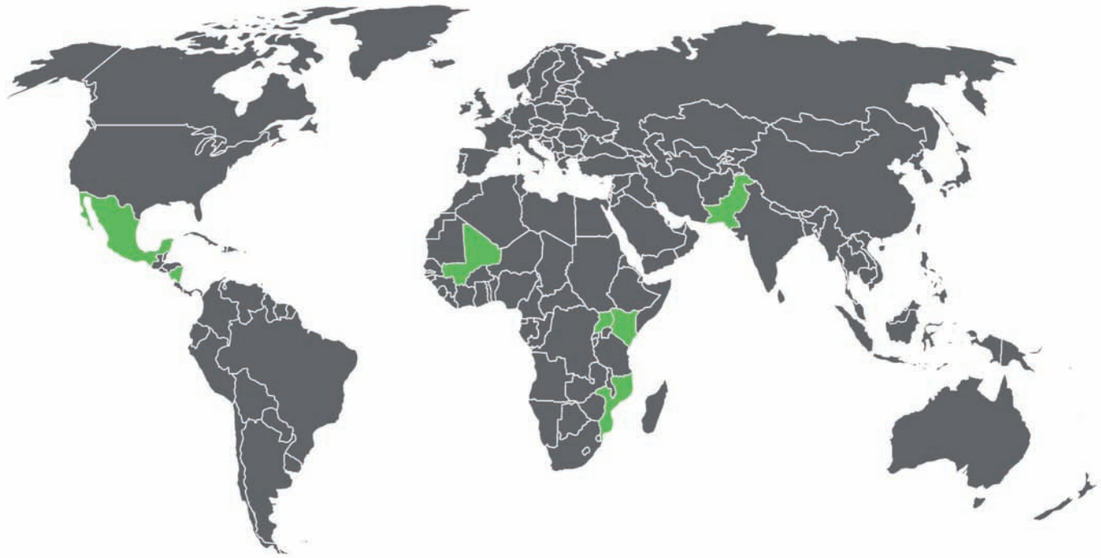
Many colleagues from PAL Network member organisations and the PAL Network Secretariat were involved in translation, logistics, training and administrative support throughout the project, and we deeply appreciate their support. We recognise the instrumental role played by Ketan, and the Assessment Team of the PAL Network in steering the entire process. In addition, acknowledgements are due to our finance teams who organised seamless movement of funds between the organisations to support this work.

Above all, our heartfelt thanks to all children and their families who interacted with us.

Uno de los efectos negativos de la pandemia en educación es ampliar las brechas entre conectados y desconectados. Aquellos que no pudieron conectarse, por falta de acceso a Internet, por falta de habilidades y/o por tiempo de atención en los hogares, tendrán mayores pérdidas de aprendizaje. Ante esta situación, ICAN funciona como una herramienta diagnóstica para que niños y niñas, maestros y directores, madres y padres, y la comunidad en general, puedan comprender de manera simple y clara, cuáles son los rezagos en matemáticas que la pandemia ha dejado en sus niños y niñas.

ICAN es fácil de aplicar y funciona para todos: para que el maestro en las aulas pueda planear mejor el regreso a clases; para que los niños y sus familias puedan motivarse por la escuela; para que el director de la escuela distribuya mejor sus recursos; para que el gobierno diseñe políticas educativas que se enfoquen en lo urgente y lo importante; y para que todos nos aseguremos que nadie se quede atrás.

Anabel Velásquez Durán, Medición Independiente de Aprendizajes (MIA), Mexico



La experiencia vivida en la Evaluación Común Internacional en Matemáticas (ICAN por sus siglas en inglés) en Nicaragua, específicamente en la visita a casi 1200 hogares de 60 comunidades rurales del Municipio de Matagalpa, fue muy peculiar. La participación activa y voluntaria de 125 estudiantes y 30 docentes de la Escuela Normal José Martí de Matagalpa permitió que, además de recolectar los resultados del propio proceso de Evaluación Común, también obtener insumos para la concreción del currículum de la formación docente en esa Escuela Normal.

El acercamiento a la realidad socio-educativa en las comunidades rurales ha sido una experiencia muy impactante y ha permitido enamorarnos aún más de nuestro oficio como educadoras/es. Es mucho lo que podemos aprender del área rural. La experiencia nos fortalece en nuestro afán de seguir contribuyendo a la calidad educativa en cuanto al desarrollo de habilidades básicas en lectura, matemáticas e interacción social.

Herman Van de Velde, Valoración Intersubjetiva del Aprender (VIDA), Nicaragua

Émerveillé par l'approche d'évaluation citoyenne des apprentissages scolaires, Monsieur M T déclarait ceci : « On n'évalue pas seulement l'enfant mais on montre également aux parents leur rôle dans la réussite scolaire de leurs enfants. Pour moi, cette évaluation avec ses outils simples et adaptés, est accessible à tous et doit être pratiquée chaque année et partout au Mali. J'ai maintenant compris que même non scolarisé, je peux aider mes enfants à apprendre, ne serait-ce que de m'assurer qu'ils ont le nécessaire qu'il leur faut le matin pour aller à l'école; leur accorder le temps pour leur devoir à la maison ; visiter souvent leur école et échanger avec leur enseignant ; leur demander de parler de ce qu'ils ont fait en classe »

Massaman Sinaba, Beekunko, Mali

As members of the PAL Network's Citizen-Led Assessments (CLA) model, since the last decade we at Idara-e-Taleem-o-Aagahi (ITA) have invested heavily in raising awareness that schooling is not learning. The CLA model of conducting simple household-based assessments for foundational learning has played a fundamental role in shifting national and global conversations to improving competencies. The compelling need for generating robustness to capture globally agreed minimum proficiency levels for both language and numeracy has finally led the PAL Network to reach a global milestone. ICAN, tested in 13 countries including Pakistan is a testimony to the guts of our Network! Conducted with children 5-16 years old, across 60 villages of Toba Tek Singh (Punjab), ICAN could not have had a better first home landing! We at ITA are privileged to be part of a global community of practice that is committed to not just measurement but more importantly learning improvement initiatives on the ground.

Baela Raza Jamil, Annual Status of Education Report (ASER), Pakistan

'I panted like a dog having walked for only 10 minutes. It was raining heavily, and I knew that we had to get this assessment to every child', are the words of one volunteer in Mwala. Yet, the assessment establishes that every 4th learner in grades 7 and 8 (completed over 10 schooling years), cannot do numeracy at grade two level. The rains will pour, the sun will scorch our heads, but we will go on. Until the 4th child learns. Our hearts unite with the volunteers of Mwala, and every Kenyan who cares, as we launch these findings. May this report energise us, and usher new hope for every learner who cannot count.

John Mugo, Zizi Afrique, Kenya

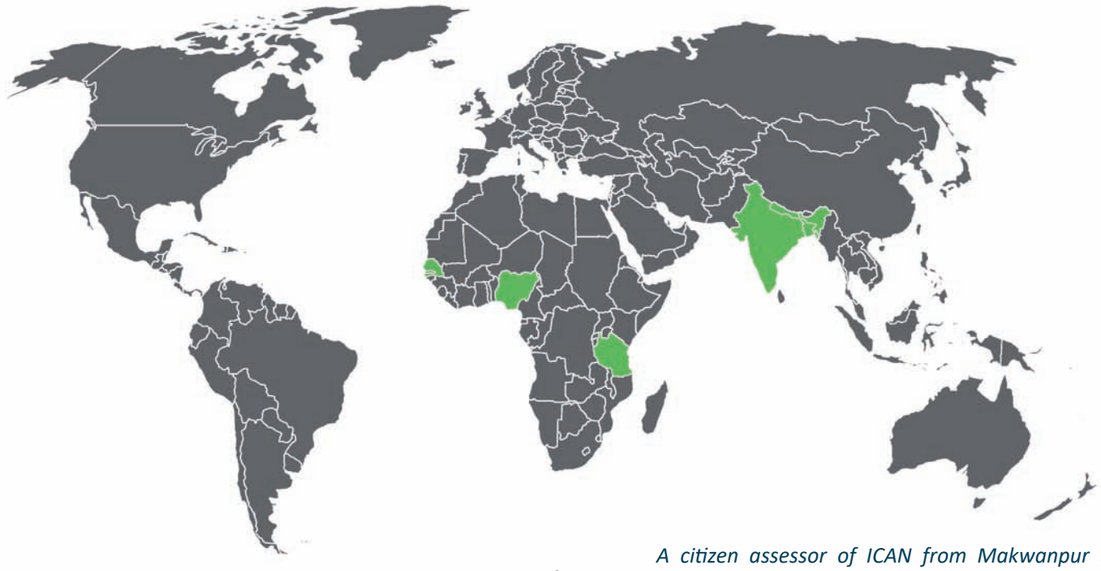
Uwezo Uganda is delighted to be part of this historic comparison of numeracy learning outcomes across 13 countries in the Global South. From 2010 to 2019 we were privileged to be part of an East African movement which assessed basic literacy and numeracy across Uganda, Kenya and Tanzania. This enabled us to generate frequent comparative learning assessment data against which individual countries in the region benchmarked for systems accountability and improvement. Participating in the International Common Assessment of Numeracy (ICAN) provides yet another opportunity to individual countries for self-assessment and peer-learning. As Giovanni Sartori, a popular political scientist has noted, 'someone who knows just one country, doesn't know anything.' We believe that being part of this historic multi-country assessment of learning outcomes will enable countries in the Global South to understand their own realities better.

Mary Goretti Nakabugo, Uwezo, Uganda

In the last four years we have seen evidence that our children are not learning. Discussions with parents, teachers and education managers have shown unanimity on the problem. However, this has not resulted in innovative governmental solutions to improve learning. The ICAN tool offers the opportunity to generate comparable data between different countries in the Global South. Piloting ICAN has shown that we can generate data with the CLA approach. I hope this new tool is ICAN for VOICE. To contribute to raising our voice for quality education for all children who are often neglected.

Matilde de Melo, Todos Pelas Crianças em Moçambique (TPC), Mozambique

For ICAN, we partnered closely with our community volunteers who did a splendid job. These volunteers played a critical role due to their familiarity with the environment, ease of communication with the community members, and the ability to keep costs low. Because our volunteers live in the community we surveyed, they demonstrated a deep and shared sense of commitment to the activities.



Preparing volunteers for the field involved much training and practice. We dispatched them in teams for repeated practice sessions until they got a firm grasp of the ICAN approach and methodology. In the end, ICAN did more than ascertain the learning levels of children; it brought members of the community together, created a connection between volunteers and households, and made everyone realise that educating our children is a joint effort that must continue to be prioritised by all.

Modupe Adefeso-Olateju, LEARNigeria, Nigeria

Après d'énormes progrès dans la fréquentation scolaire au cours des deux dernières décennies grâce à plusieurs initiatives, l'un défi majeur que rencontre le système éducatif des pays en développement dont le Sénégal demeure la qualité des apprentissages. Les tests en mathématiques et/ou en lecture réalisé par divers acteurs montrent tous la persistance des lacunes chez les enfants scolarisés dès le primaire. Dans ce contexte, il urge de connaître de manière fine les difficultés rencontrées par les enfants afin de développer les solutions adéquates. L'évaluation ICAN entre largement dans cette perspective. Elle offre aux décideurs locaux, nationaux et internationaux des informations clés sur le niveau et les types de difficultés, pour l'instant en mathématique, que rencontrent les enfants dans nos pays. Il s'agit ainsi d'un outil précieux, qui vient renforcer, au Sénégal, ceux développés par le LARTES-IFAN de l'Université Cheikh Anta Diop (Jàngandoo, Programme de la Remédiation à l'Élémentaire) au service du développement de la qualité des apprentissages.

Soufianou Moussa, Jàngandoo, Senegal

A citizen assessor of ICAN from Makwanpur (Nepal) during the fieldwork: 'I was shocked to find that a grade 8 student couldn't solve a grade 2 division problem. What can I do?' This anecdote tells us that ICAN not only offers international comparability of results aligned to SDG 4.1.1 (a), but also inspires local youths and community members to raise the standards of numeracy in constructive ways. Thus, ICAN is an important tool for local youths, teachers, students, parents and the governing body. I believe that ICAN assessment tool is able to take diversity into account in order to obtain a fair estimation of learning as it is available in 11 different languages. The lead of PAL Network to come up with ICAN as new global standard numeracy dataset from the Global South is very relevant for us at the moment.

Rajib Timalsina, Annual Status of Education Report (ASER), Nepal

Fifteen years ago, we could never have imagined that Pratham's approach to measuring children's foundational learning would travel the globe and seed collaborations across the Global South. The development and release of ICAN, a product of these shared priorities and joint efforts, could not have come at a more opportune moment. We don't yet know the full extent to which the ongoing crisis caused by COVID-19 will affect our world and our children. We do know that even before the pandemic, large proportions of children were not receiving the education they need and deserve. This situation will be far worse in the days ahead.

ICAN is in the public domain, available in 11 languages, aligned to SDG 4.1.1 (a), and can be used in a variety of contexts. Its release reminds us all that wherever we are and whatever our differences, we have both the responsibility and the ability to work together towards shared global goals.

Suman Bhattacharjea, Annual Status of Education Report (ASER), India

Messages from PAL leaders

ICAN is a locally rooted, globally scaled tool for the assessment of foundational numeracy of children. By being so, it not only solves the dilemma of local vs global assessment debate, but also embodies the strategic benefits of both approaches. Most globally comparative assessments are centrally developed and then translated for other countries, which fail to address national policy apparatus and often lack localisation. ICAN was designed collaboratively in 11 languages, based on the national curriculum of PAL member countries. Therefore, it is effective in both monitoring and advocating for the quality of education nationally, and in monitoring the progress towards achieving global education goals such as SDG 4.1.1 (a).

Syeed Ahamed, Annual Status of Education Report (ASER), Bangladesh

It was in November 2019, when I visited some households in selected villages during ICAN assessment of children aged 5-16 years in Arusha district. I was excited to see how volunteers had mastered the tools and were assessing children with confidence. Parents were happy to see their children attempting numeracy tests that were also being attempted by other children in 12 countries. During the assessment at the households, each child was eager to take the test. From that experience, I was wondering: What could be more thrilling than having a Global South initiated International Common Assessment of Numeracy which is easy to administer and allows to compare results across the countries? As ICAN tools are simple to use, reliable, and easy to administer, they can facilitate independent ranking of achievement of SDG 4.1.1 (a) globally and within a specific country.

Zaida Mgalla, Uwezo, Tanzania

1. Background: PAL Network and Citizen-Led Assessments

The People's Action for Learning (PAL) Network was formally established in 2015 as a South-South partnership of organisations across three continents engaged in regular citizen-led assessments (CLAs) of children's foundational reading and numeracy. These assessments offer a method for assessing learning outcomes that is grounded in the realities of the Global South. They focus on foundational reading and numeracy skills and are conducted orally, one-on-one with each child, so as not to assume that children can read; they are conducted in households, rather than in schools where not all children are enrolled or attend regularly; and they are simple and quick, in order to encourage the involvement of 'ordinary people' and thus increase the visibility of the problem of poor foundational learning. In many cases, PAL Network member organisations also implement action programs aiming to ensure that all children acquire these foundational skills.

The CLA model was born in India in 2005 when Pratham, one of India's largest NGOs, designed an innovative approach to assessing the foundational reading and numeracy abilities of all children, regardless of their schooling status. This assessment is the Annual Status of Education Report (ASER) in India. Over the past 15 years, the ASER tools and approach have been borrowed and adapted by many countries across the Global South. CLAs evolved organically from this approach, spurred by the interest of citizens who understood the importance of obtaining reliable data on children's foundational learning that could build awareness and inform policy and practice.

CLAs are not intended to be an internationally comparable metric of learning; they are nationally relevant snapshots of what children can or cannot do. Each new member to the network retains the core principles underlying CLAs, but adapts the assessment and survey tools to align to the national curriculum framework and measures learning according to their own national standards. Thus, while the approach remains the same, both content and execution of CLAs varies across implementing countries.

However, the development of common global goals for education as reflected in Sustainable Development Goal 4 and the need for comparable data to monitor education quality targets has meant that many low- and middle-income countries face increasing pressure to participate in existing international and

regional assessment programs. These learning assessments are based on models and methods that emerged in the context of Global North countries, which have characteristics that are often very different from those of countries in the Global South, including several decades of universal enrolment; comprehensive records of all schools in the country; and significant proportions of parents who are themselves literate and thus better able to support their children's learning. In these education systems, assessment is usually an integral part of the larger teaching-learning framework that guides the schools' functioning, with data on students' progress feeding into decisions and plans for improvements in the education system. Existing international and regional assessments are designed to inform policy makers and education planners, rather than teachers, parents, and other actors on the ground; and they do not generate actionable information at lower levels of performance where a large proportion of children in the Global South are usually located. This type of evidence is urgently needed by school systems in the Global South. Specifically, measurement of foundational reading and numeracy skills in early primary grades is critical to identify problems and intervene to resolve them early in children's schooling trajectory.

The PAL Network has responded to the need for a comparable, low cost assessment that meets these Global South realities by developing a new assessment tool and making it available in the public domain.

ICAN (International Common Assessment of Numeracy), a simple-to-use and scalable tool that measures children's foundational numeracy, is designed to align to SDG 4.1.1 (a), an indicator for which existing international assessments are not able to generate comparable data. This report highlights the features of ICAN that make it relevant to Global South contexts.

In addition, the report summarises the first large-scale implementation round of ICAN in late 2019 and early 2020, and showcases examples of the kinds of analyses that are facilitated by household-based implementation of ICAN on scale. Achievement of SDG 4.1.1 (a), the most basic of the learning targets established by SDG 4, will require the availability of this type of evidence.

2. Context: Why ICAN?

Global goal for education: Sustainable Development Goal 4

In September 2015, 193 countries adopted 17 Sustainable Development Goals (SDGs) that provided a framework for measuring progress over the next 15 years.

SDG 4 focuses on ensuring "inclusive and equitable quality education and lifelong learning opportunities for all." It sets bold and ambitious new targets that aim to ensure that all children are included, stating that "no education target should be considered met unless met by all" (UNESCO 2015, p. 7)

Each global goal consists of a number of targets and associated indicators that guide countries in measuring progress towards the goal. This 'global indicator framework' defines a 'target' as a specific, measurable objective that contributes to achieving one or more of the goals; and 'indicators' as markers that enable the measurement of change over time. Since 2015, there have been intensive efforts to design metrics intended to measure and track countries' progress towards the SDG targets via their respective indicators.

SDG 4 includes 10 targets and 11 indicators to measure progress towards achieving the global goal (UNESCO Institute for Statistics, 2018). The first target (SDG 4.1) states: "By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes."

Within Target 4.1, the first indicator (SDG 4.1.1) tracks the "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".

Availability of comparable data to monitor SDG indicator 4.1.1 (a)

Foundational reading and numeracy skills are the building blocks for future progress, both in school and beyond. The collective experience of the PAL Network over the past 15 years demonstrates that children who fail to acquire these foundational skills in the early grades fall further and further behind, with few opportunities to catch up later on.

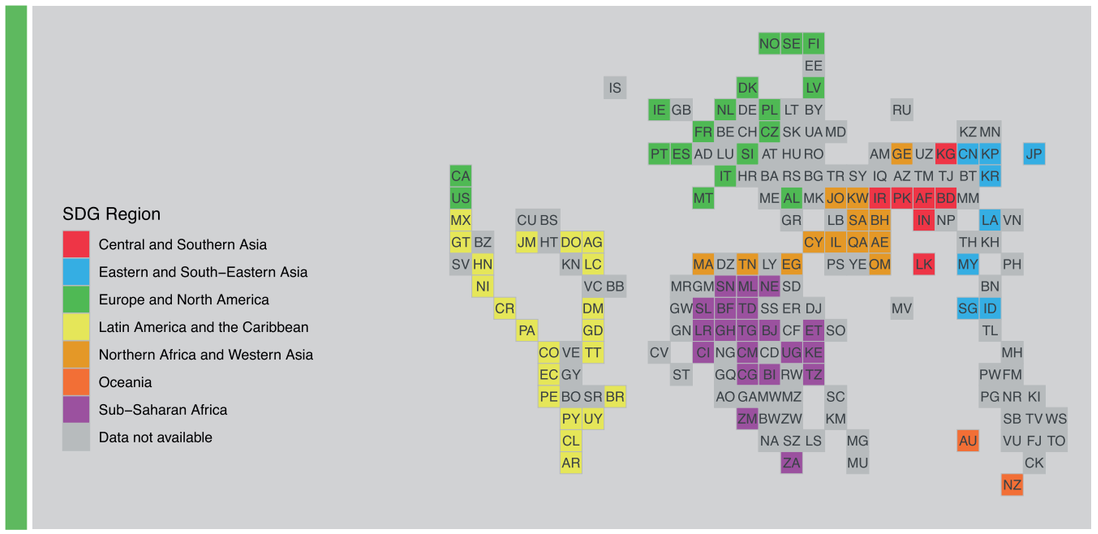
This has enormous implications for equity, since research also shows that the most marginalised are more likely to fall behind (Rose, Sabates, Alcott, and Ilie, 2016). It is therefore critical to measure learning early so that corrective measures can be implemented early in children's school trajectories. These are the major arguments underlying the inclusion of SDG 4.1.1 (a) for class 2 or 3 as an indicator of progress towards the larger SDG 4.1 target.

As the custodian agency for SDG 4, the UNESCO Institute for Statistics (UIS) has mapped the data availability of assessments that measure learning progress for class 2 or 3 in reading and mathematics for Indicator 4.1.1 (a), shown in Figure 2.1 below. Data availability is based primarily on data published by agencies and organisations specialised in cross-national (international or regional) learning assessments. Data are currently comparable only for countries which participated in the same assessment. The UIS database also contains data from national assessments that followed a specific reporting protocol devised by the UIS to guarantee minimum quality and comparability standards.

Figure 2.1 shows countries with at least a single data point from 2010 to 2019 for class 2 or 3, either for reading or mathematics. While learning assessment data exists in a number of countries across the Global South, these data are of limited relevance for tracking progress towards SDG 4.1.1 (a), for the following reasons:

- Most of these assessments are conducted in schools and therefore do not present a complete picture of learning that includes all children.
- Robust estimates are unavailable for many low- and middle-income countries, where only about two-thirds of children and youth are actually in school (UNESCO Institute for Statistics, 2017a).
- Although several countries include early grade assessment within their national assessment programs, every country sets its own objectives and standards. As a result, the performance levels defined in these assessments are not always consistent or comparable.

Figure 2.1: Data availability map for global indicator 4.1.1 (a) in class 2 or 3 (reading or mathematics)



Source: UNESCO Institute for Statistics (2019), p. 15

Existing international assessments such as the Trends in International Mathematics and Science Study (TIMSS) targeted at classes 4 and 8, and Programme for International Student Assessment (PISA) targeted at 15-year-olds, are steadily increasing their coverage to low- and middle-income countries. However, assessments of foundational learning are required much earlier if existing gaps are to be identified and remedied in time. Among the regional learning assessments, only Programme d'Analyse des Systèmes Educatifs de la CONFEMEN (Programme for the Analysis of Education Systems or PASEC) in French speaking Sub-Saharan Africa, and the Laboratorio Latinoamericano de Evaluación de la Calidad de la Educación (Latin-American Laboratory for Assessment of the Quality of Education or LLECE) in Latin America, assess learning outcomes for children in class 2 and 3, respectively. Other regional assessments such as the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) in Southern and Eastern Africa, Pacific Islands Literacy and Numeracy Assessment (PILNA) in the Pacific Islands, and the Southeast Asia Primary Learning Metrics (SEA-PLM) in South East Asia, all focus on the end of primary schooling.

Assessments that include foundational learning for children in early primary grades include the Early Grade Reading/Math Assessment (EGRA and EGMA), as well as UNICEF's Foundational Learning Module in the household-based Multiple Indicator Cluster Survey (MICS). However, the tasks covered by these assessments are limited, especially in numeracy, and do not cover a number of important domains such as spatial orientation, measurement and shape recognition that commonly exist in curricula for primary classes 2 or 3 as well as in the minimum proficiency level criteria established for SDG 4.1.1 (a).

In summary, despite significant progress in obtaining more and better learning assessment data with greater geographic coverage, there is still more to do to ensure that assessments of foundational skills are designed for the realities of Global South countries and available in the public domain.

In projections made in 2019, well before the current COVID-19 pandemic, the UIS warned that the need for accurate, timely and comparable data on learning had never been more urgent, with the prospects of reaching SDG 4 far from certain (UNESCO Institute for Statistics, 2019). The outlook in 2020 is significantly worse, and the need to act swiftly correspondingly greater.

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3. What does ICAN measure?

ICAN includes two types of data collection instruments: the assessment tool and the contextual questionnaires.

The ICAN assessment tool

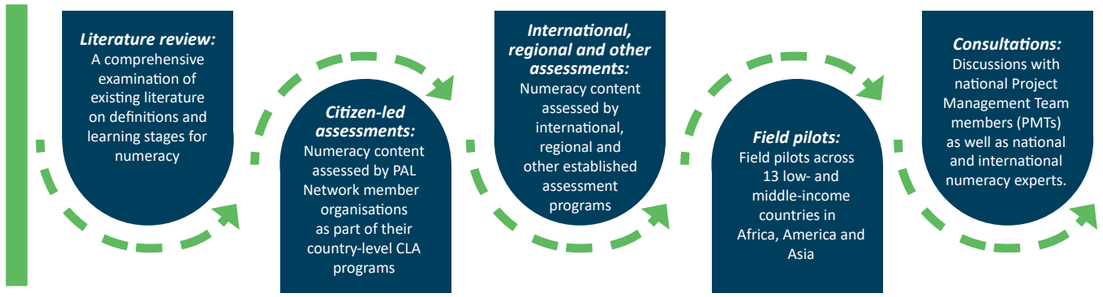
Definitions of foundational numeracy commonly include domains such as number knowledge, measurement, geometry and simple data display.[1]

The minimum proficiency level descriptor for numeracy under SDG 4.1.1 for classes 2 or 3 also requires students to demonstrate skills in number sense and computation, shape recognition and spatial orientation.

Rather than focusing on specific education objectives in individual countries, ICAN assessment tasks align to UNESCO's Global Proficiency Framework, which defines minimum proficiency levels that learners are expected to demonstrate more generally.

The ICAN assessment administration process includes recommendations regarding specific procedures to follow to ensure that the assessment results reflect the best that each child can do. The assessment process is adaptive to children's ability, so that they do not have to attempt all levels of the tool. In addition, the child's comfort and a commitment to accurately recording her best possible response are central to the administration process.

Figure 3.1: Development of ICAN assessment tasks



[1]For instance, see Clements, D.H., Baroody, A.J. and Sarama, J. (2014). Background Research on Early Mathematics. Background Research for the National Governor's Association (NGA) Center Project on Early Mathematics. https://www.du.edu/marsicoinstitute/media/documents/dc_background_research_early_math.pdf

Figure 3.2: Overview of domains and tasks in the ICAN assessment tool

50%

NUMBER KNOWLEDGE

- Counting, comparing number of objects
- Number recognition
- Operations (without and with carry-over, borrow and remainder)
- Real world problems

50%

GEOMETRY

- Position and direction
- Shapes and figures

MEASUREMENT

- Length and capacity
- Time and calendar

DATA DISPLAY

- Retrieving simple information

Box 3.1: Key facts about the ICAN assessment tool

- Open source
- Available in 11 languages
- Most tasks are aligned to grade 3 level or lower of the UNESCO Global Proficiency Framework
- Can be used in both household and school settings
- Suitable for a broad age group of learners, in order to identify gaps in foundational numeracy even among older children
- Oral, one-on-one administration in order to include all children regardless of reading ability
- Average administration time of 15 minutes per child
- Progressive assessment administration - only children who can do easier number operation tasks are given more advanced tasks
- Low cost facilitates large-scale implementation in low resource contexts

Field enumerators are trained to build rapport with children to create a relaxed and encouraging environment, including elements such as:

- Speaking slowly and clearly to ensure that all children are able to fully understand the expectation from the task
- Giving children adequate time to complete each task
- Allowing children to use paper and pencil to work out problems, if they wish to do so

ICAN contextual questionnaires

ICAN's contextual questionnaires are used to collect information on key socioeconomic indicators. Information is collected at three levels:

1. **For each surveyed child**
   - Past and current pre-school and school status
   - Enrolment in paid tuition classes
   - Parents' education
2. **For each sampled household**
   - Basic infrastructure and assets
   - Availability of reading material in the household
3. **For each sampled community**
   - Basic infrastructure and facilities
   - Availability of schools and pre-schools

When used as part of a household-based assessment, these questionnaires generate valuable background information about the households and communities surveyed, enabling contextualisation of the results obtained from the assessment. Some examples of how assessment and contextual data generated from household-based implementation of ICAN can be used together are provided in Section 6 of this report.

When the ICAN assessment tool and household questionnaire are used together in a household survey, the process takes an average of 20-30 minutes to complete in each household.

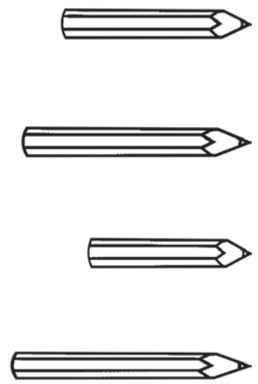
ICAN assessment tasks *

SET 1

Measurement

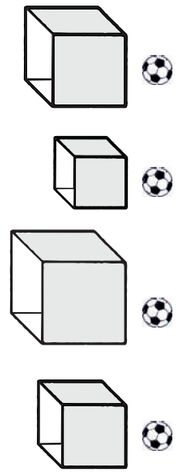
Task 1

In this picture, which is the shortest pencil?



Task 2

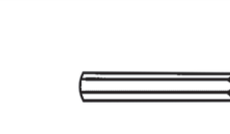
Here are 4 balls of the same size. Now look at the box kept next to each ball. If we completely fill each box with the kind of balls shown, which box will have the most number of balls?



Shape recognition

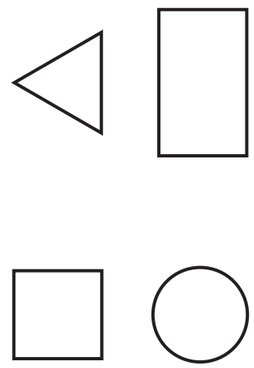
Task 1

Which of these is a straight line?



Task 2

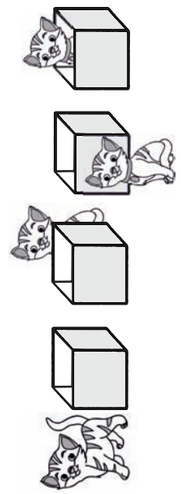
Look at these shapes. Which of these is a triangle?



Spatial orientation

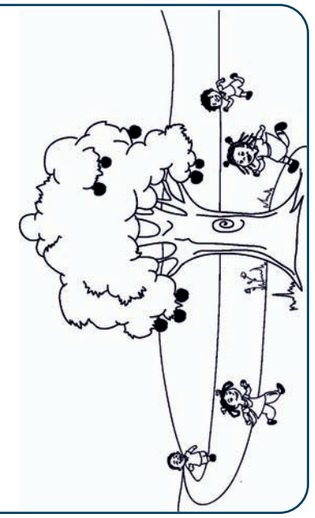
Task 1

In this picture, which cat is inside the box?



Task 2

In this picture, which child is farthest from the tree?



GIVE SET 1 TASKS TO ALL CHILDREN

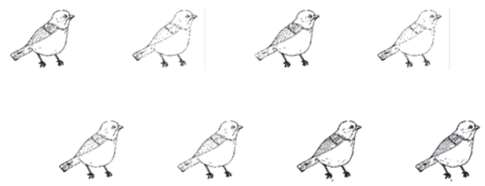
*ICAN assessment tool is available in 11 languages on the PAL Network website (www.palnetwork.org)

ICAN assessment tasks

SET 1

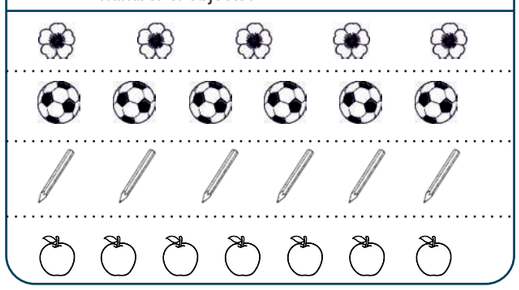
Counting objects

Task 1 How many birds are here? Choose the correct number.



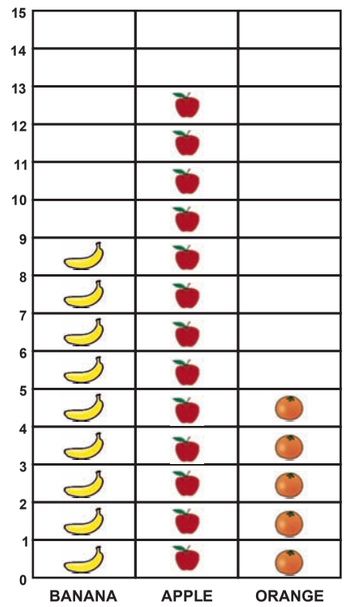
6 8 9 5

Task 2 There are 4 groups of objects given here. Look at them carefully. Which group has the most number of objects?



Simple data display

Look at the chart given below carefully.



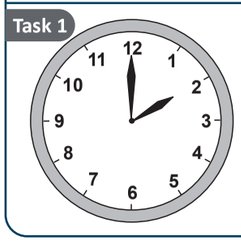
Task 1 How many apples are there?

Task 2 How many more bananas are there than oranges?

Telling time

What is the time in this clock?

Task 1



Task 2

Telling day and date

Look at the calendar given below.

MARCH 2019

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

Task 1 What is the day on 5th March?

Task 2 What is the date on the second Monday of March?

GIVE SET 1 TASKS TO ALL CHILDREN

ICAN assessment tasks

SET 2

SET 3

Number recognition

Task 1 Recognise numbers.

3 2 8 0 9

At least 4 out of 5 numbers must be correct

Task 2 Recognise numbers.

48 22 84 97 30

At least 4 out of 5 numbers must be correct

Addition, Subtraction, Multiplication, Division

Solve the following questions.

Task 1

3 2
+ 1 5

Task 1

4 6
- 2 1

Task 1

2 x 4 =

Task 1

9 ÷ 3 =

Solve the following questions.

Task 2

5 6
+ 1 7

Task 2

7 8
- 2 9

Task 2

4 2
x 6

Task 2

7) 9 3

Word problem

Task 2a - Subtraction Listen to the question carefully, solve and answer.

There were 43 children in the park. Out of these, 25 of them have gone home. How many children are left in the park now?

Task 2b - Division Listen to the question carefully, solve and answer.

A shopkeeper has 48 apples. He keeps 3 apples in each box. How many such boxes will he need to keep all the apples?

GIVE SET 2 TASKS TO ALL CHILDREN. SET 3 TASKS TO BE GIVEN TO ONLY THOSE CHILDREN WHO COULD DO THE CORRESPONDING SET 2 TASK CORRECTLY.
For example, Task 2 on addition will only be given to children who could do Task 1 on addition correctly.
Similarly, the subtraction word problem will only be given to children who could do Task 1 on subtraction correctly.

4. Large-scale household-based implementation of ICAN

Overview

In late 2019 and early 2020, PAL Network member organisations conducted a large-scale household-based assessment using ICAN assessment tool in 13 low- and middle-income countries across Africa, America and Asia. This first round of scaled-up implementation was restricted to one rural district[1] in each participating country, in order to test feasibility in a variety of geographies.

The ICAN 2019 survey was designed in line with the architecture that has been the strength of existing CLAs over the past fifteen years.

The following core features of this architecture are designed to address ground realities in the Global South:

- **Household-based assessment aims to ensure inclusion of all children irrespective of schooling status**

  Despite significant progress in increasing enrolments, in many countries of the Global South not all children in the school-going age group are enrolled in school. Of those who are enrolled, some attend schools that are not officially recognised, and education systems in many countries lack a comprehensive list of all schools from which to draw a representative sample. Attendance rates also vary vastly across and within countries, biasing estimates of learning generated by school-based assessments towards students who attend more regularly. **By conducting the assessment in sampled households, ICAN 2019 represents all children in the target population, not only those regularly attending officially recognised schools.**

- **Oral, one-on-one assessment ensures inclusion of children who cannot read fluently**

  Learning assessment data from across the PAL Network shows that on average, half of all children in class 5 are unable to read a simple class 2 level text.[2] These findings are echoed in the World Bank's Learning Poverty indicator which showed that over 50% of 10-year-olds in low and middle-income countries were not able to read and understand a simple text.[3] Currently, most learning assessments are administered in classroom-based groups using paper-pencil tests. Children who are struggling to read cannot be fairly and accurately assessed using tests that assume the ability to read. **ICAN is designed as an oral, one-on-one assessment, as this is the only way to understand what children know and can do, independently of whether or not they can read.**

[1]For ease of communication, 'District' in this report refers to a sub-state/regional/provincial unit, which is known by different names in different countries. For instance, this unit is called a Local Government Area in Nigeria, a District in India, a Department in Senegal, and so on.

[2]PAL Network. (2017). Citizen-led Assessments of Basic Learning to Track SDG4.1.1. https://palnetwork.org/wp-content/uploads/2017/11/2017_COMMS_InformationBrief_CLA4PagerSDG4.1.1_VO2_EN.pdf

[3]World Bank. (2019). Ending Learning Poverty: What will it take? https://openknowledge.worldbank.org/bitstream/handle/10986/32553/142659.pdf?sequence=7

- **Tools, processes, and data are easy to understand, ensuring wider engagement**

  Sophisticated measurement systems for data collection have a relatively long history in countries in the Global North, but this culture of measurement is nascent in much of the Global South where the capacity to design assessments that can feed into action on the ground is often limited. Simple-to-use assessment tools and processes, easily understandable data, and evidence that can effectively be translated into action are all important elements that can fuel broader awareness, policy dialogue, and action. **ICAN tools and processes are simple to use and understand, in order to facilitate engagement by a wide range of stakeholders, including parents and community members.**

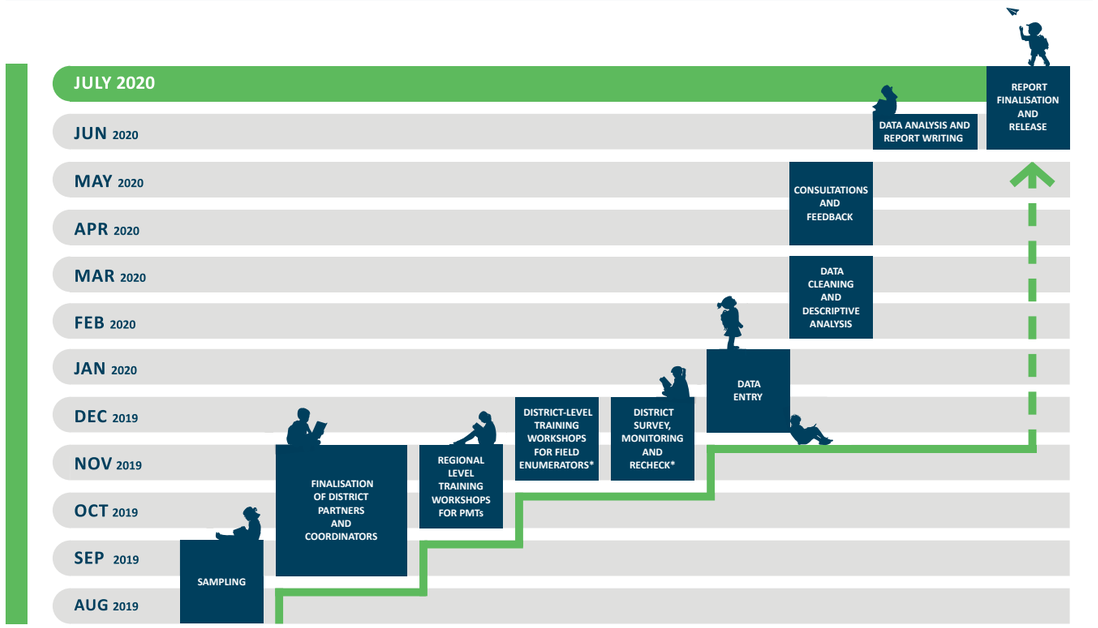
- **Collaborations with local stakeholders create awareness and can fuel local action**

  The belief that more years of schooling automatically translates into more learning is still very common; and often it is only first-hand experience of a problem that challenges assumptions and changes mindsets. The CLA architecture actively promotes the involvement of local partners, in order to ensure that both recognition of the problem and discussions about solutions can spread. **In order to encourage local discussions and solutions, ICAN 2019 was implemented in collaboration with organisations, institutions, and individuals based in the sampled district in each participating country.**

Timelines and coverage

In line with these principles, ICAN was conducted in one rural district each in 12 countries towards the end of 2019 and in Nicaragua in early 2020. Staff from PAL Network member organisations were identified as Project Management Team (PMT) members to lead the implementation in the selected district. In addition, local District Coordinators (DC) were recruited for the survey duration. ICAN 2019 roll-out processes, summarised in Figure 4.1, were designed to align with PAL Network's Data Quality Standards Framework (DQSF).[4]

Figure 4.1: Overview of ICAN 2019 survey processes and timeline



*Except Nicaragua, where the district-level training workshop and survey were conducted in February 2020

[4]PAL Network. (2018). Data Quality Standards Framework. https://palnetwork.org/wp-content/uploads/2018/04/2018_PAL-Network_DQSF_FINAL.pdf

DQSF was drafted through internal consultation with PAL Network experts and informed by international best practices, and was launched via UNESCO Institute for Statistics in April 2018.

Alignment to DQSF meant that all ICAN 2019 processes were standardised across participating countries throughout the assessment process.

- In each district, 60 rural communities[5] were randomly sampled in order to generate estimates that were representative of the district.
- In each rural community, the assessment was administered in 20 randomly sampled households to all children in the age group of 5-16 years, in order to assess foundational numeracy skills of all children of school-going age regardless of schooling status.
- The assessment was conducted with a total of over 20,000 children in these households, each of whom was assessed orally, one-on-one so as to include all children irrespective of their ability to read.
- Information on children's schooling status, parental education and household and community infrastructure was also collected, enabling analysis of the ways in which contextual factors relate to children's foundational numeracy.

Sampling

District selection

In this first edition of ICAN, survey coverage was limited to a rural sample and the scale of the survey was limited to one district in each participating country (Figure 4.2). Accordingly, each participating organisation selected one rural district of the country, based on pre-determined criteria which aimed to ensure that the predominant medium of instruction in the district was the same as the language in which the assessment tool was available; and also that existing assessment data did not identify the district as an outlier in terms of children's foundational numeracy.

Selection of rural communities and households

The sampling strategy used in ICAN 2019 was designed to generate a representative picture of each sampled district. The sample design of ICAN 2019 is a two-stage design, with rural communities sampled in the first stage and households sampled in the second stage. In the first stage, in each district, 60 rural communities were sampled using the Probability Proportional to Size (PPS) sampling technique. PPS is a widely used standard sampling technique for the first stage when the sampling units are of different sizes. In the second stage, 20 households were randomly sampled in each rural community.

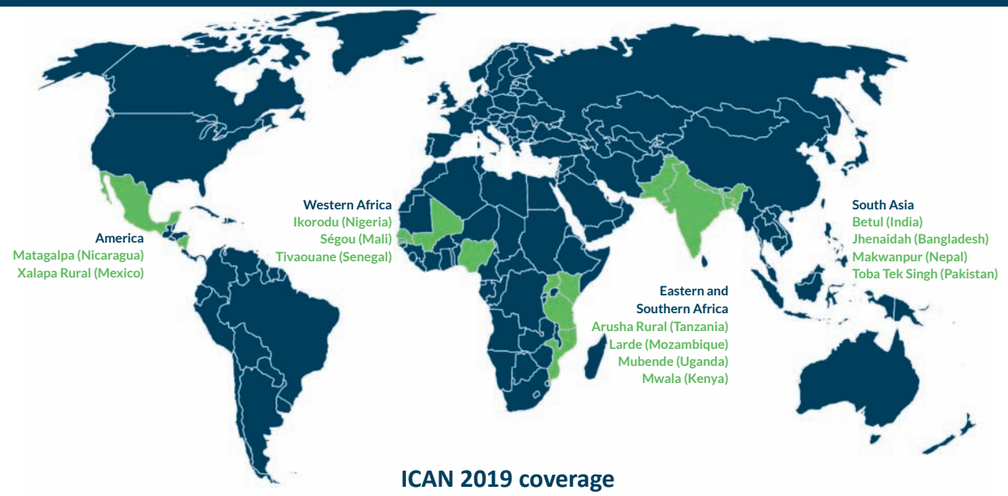
Target population

Unlike school-based assessments and consistent with the CLA approach of assessing all children regardless of schooling status, ICAN defines its target population by age rather than class. Across all districts covered in ICAN 2019, all children in the age group of 5-16 years in sampled households were surveyed. This age range takes into account a number of different but interrelated factors, including the prescribed age of entry to and completion of primary school in participating countries; the reality of large proportions of overage children in primary classes in Global South countries; and the fact that many older children are not able to handle foundational tasks despite several years of schooling.

The development and implementation of the sampling plan was a collaborative exercise involving the PAL Network leaders, PMTs and the PAL Network Secretariat. The PMTs built consensus on the target age group; identified the district to be surveyed; arranged the official sampling frame of all rural communities in the sampled district; worked with local sampling experts to do the sampling; and kept track of rural communities surveyed and the use of replacement rural communities, if any. PMTs used a series of sampling formats to document the completion of each of these tasks.

[5]Rural communities are called by different names in different countries. For instance, these units are called Villages in India and Pakistan; Enumeration Areas in Kenya, Uganda, Tanzania, Mozambique; District in Senegal, and so on. For ease of communication, this report refers to all of these as 'rural communities'.

Figure 4.2: District sampled for ICAN 2019 in each participating country and total coverage



ICAN 2019 coverage

3 continents	13 countries	13 rural districts	779 rural communities	15,000+ households	20,000+ children

Table 4.1: ICAN 2019 sample description

Region	Sampled district (Country)	Surveyed rural communities	Surveyed households	Assessed children						
				Age 5-16	Age 5-6	Age 6-10	Age 11-16	Class 2-3	Class 4-6	Class 7-8
Eastern and Southern Africa	Arusha Rural (Tanzania)	60	1198	1655	290	744	753	403	413	226
	Larde (Mozambique)	60	1200	1630	358	914	558	460	295	58
	Mubende (Uganda)	60	1200	1853	373	898	758	454	499	86
	Mwala (Kenya)	60	1200	1140	125	428	649	206	366	224
Western Africa	Ikorodu (Nigeria)	60	1193	1552	318	778	607	304	384	256
	Ségou (Mali)	60	1173	2649	503	1477	926	488	473	74
	Tivaouane (Senegal)	59	1180	3125	539	1583	1261	582	524	140
America	Matagalpa (Nicaragua)	60	1191	1172	225	674	392	328	379	100
	Xalapa Rural (Mexico)	60	1199	586	94	286	258	133	171	89
South Asia	Betul (India)	60	1200	1194	153	507	629	214	310	216
	Jhenaidah (Bangladesh)	60	1200	893	114	407	432	181	225	143
	Makwanpur (Nepal)	60	1200	1023	161	449	511	192	308	182
	Toba Tek Singh (Pakistan)	60	1198	1616	183	737	780	369	515	266
ICAN 2019		**779**	**15532**	**20088**	**3436**	**9882**	**8514**	**4314**	**4862**	**2060**

Field implementation

Training

ICAN 2019 was implemented by PAL Network member organisations in collaboration with local institutions, non-governmental organisations, or individuals in each sampled district. Robust training was an essential part of the process. Training workshops included both classroom sessions as well as a field visit to practice ICAN tools and procedures in order to ensure that all implementing teams understood the survey processes correctly and in a standardised manner. Two tiers of training workshops were implemented, first at the regional level where PMTs were trained, and then at district level where field enumerators were trained.

Regional-level training workshops

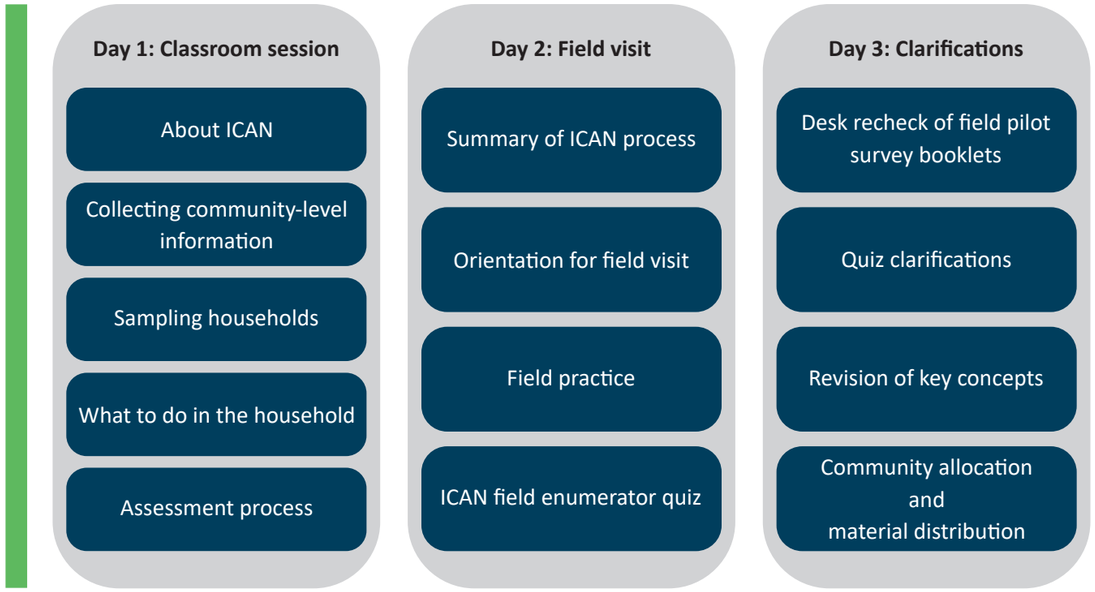
PAL Network member organisations implementing ICAN 2019 participated in one of two 4-day regional training workshops - one in Machakos, Kenya (11-14 October 2019) and the other in Kathmandu, Nepal (8-11 November 2019).[6] The objective was to train the country-level PMTs, who then went on to train the field enumerators in their respective districts. In addition to mastering field processes, PMTs were also trained on back-end processes such as quality control systems and financial reporting requirements.

District-level training workshops

Subsequently, PMTs led training sessions in their survey districts which aimed to ensure that field enumerators thoroughly understood and practiced the survey process before conducting the survey in the field. The district-level training workshops were structured similarly to the regional-level trainings and spanned 3 days, including classroom sessions and a practice field visit (Figure 4.3). Daily attendance was mandatory and field enumerators took a quiz that assessed their understanding of the process.

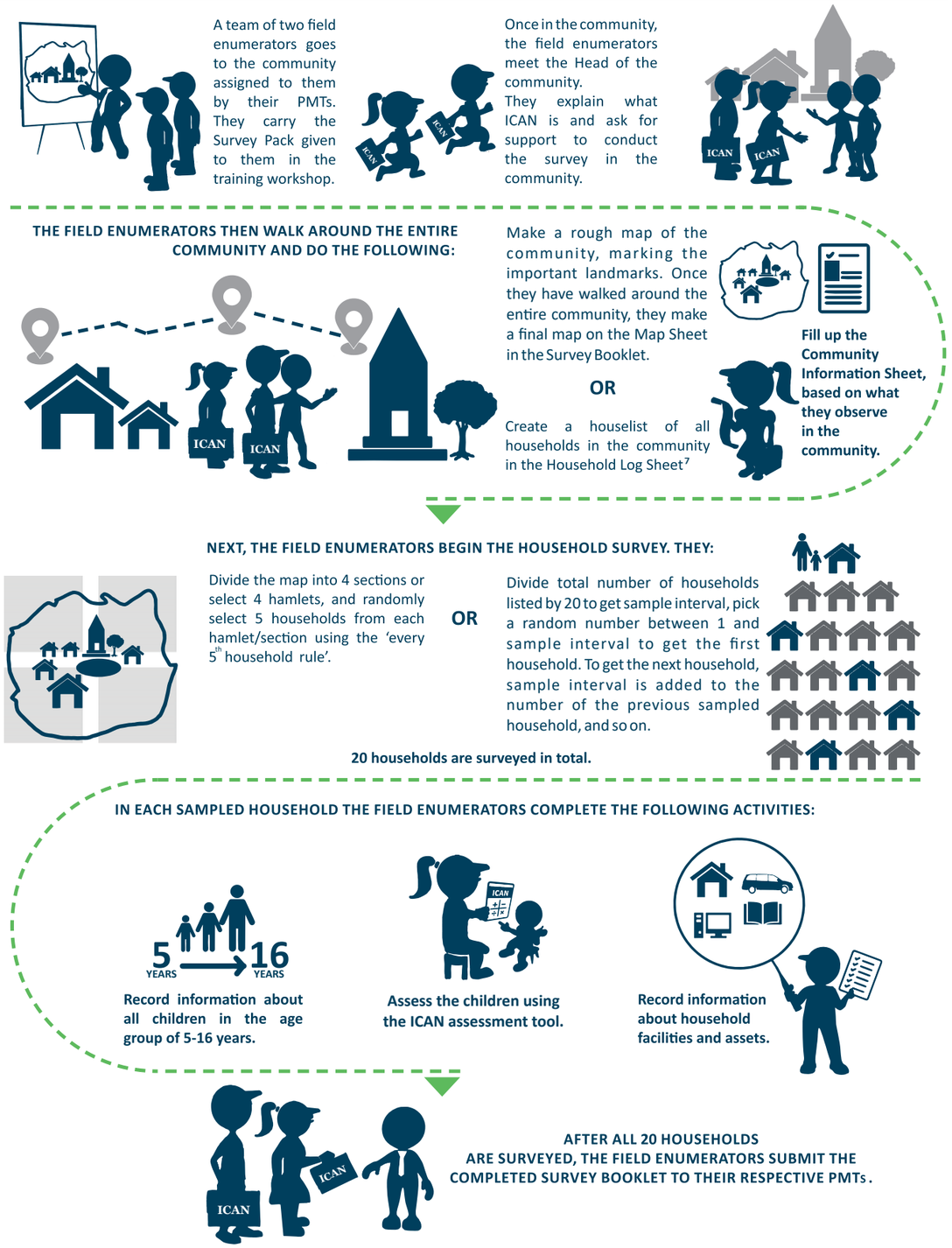
In all, more than 800 field enumerators participated in ICAN 2019 district-level training workshops.

Figure 4.3: ICAN 2019 district-level training workshop sessions



[6] 10 out of 13 participating PAL Network member organisations attended these regional-level training workshops. PMTs in Mexico, Nicaragua and Senegal were trained via online training sessions.

Figure 4.4: ICAN 2019 data collection process



[7]Procedures for sampling households within each community varied depending on procedures used by participating PAL Network member organisations in their own CLA programs. Countries in Eastern and Southern Africa and Nigeria and Senegal from Western Africa created houselists at the community level whereas countries in America, South Asia and Mali from West Africa followed the community mapping process and 'every 5th household' rule to sample households. Both these methods ensure that households are sampled randomly and do not affect the comparability of results across districts.

Quality control

In order to ensure robustness of all survey processes and reliability of data, stringent quality control measures were implemented at each stage of the ICAN 2019 survey.

Principles of quality control

Based on the DQSF guidelines, the quality control processes for ICAN were developed keeping two key principles in mind:

- Simplicity: ICAN is designed for scale and implemented with the help of local field enumerators. Field processes for quality control are kept simple so that various layers of people can be trained quickly, and information on the field can be collected accurately.
- Actionable: Quality control processes are designed to ensure that at each stage of the survey, the quality is checked and immediate corrective action is taken where required.

Quality control processes

Broadly, quality control processes can be divided into preparatory processes, field processes and data entry processes.

Preparatory processes: Translation

ICAN assessment tasks were developed in English and then translated into the language selected by each member organisation (Table 4.2).

The Forward Translation method was used to translate documents: A local translator translated the documents from English into the target language. Translated versions were reviewed by internal teams and piloted in the field.

Field processes: Monitoring and recheck

PMTs responsible for ICAN 2019 in their countries and local District Coordinators (DCs) recruited for the project were responsible for carrying out quality control processes in the field.

- During the survey: Monitoring

  During the survey, the PMTs and DCs supported field teams needing additional support in the field by visiting rural communities in which the survey was taking place. For communities that PMTs and DCs could not visit physically, they made phone calls to field enumerators to check whether the survey was conducted in accordance with survey guidelines.

Table 4.2: ICAN 2019 assessment tool languages

Region	Sampled district (Country)	ICAN assessment tool language
Eastern and Southern Africa	Arusha Rural (Tanzania)	Kiswahili
	Larde (Mozambique)	Portuguese
	Mubende (Uganda)	English
	Mwala (Kenya)	Kamba, English
Western Africa	Ikorodu (Nigeria)	English
	Ségou (Mali)	French
	Tivaouane (Senegal)	Wolof, French
America	Matagalpa (Nicaragua)	Spanish
	Xalapa Rural (Mexico)	Spanish
South Asia	Betul (India)	Hindi
	Jhenaidah (Bangladesh)	Bangla
	Makwanpur (Nepal)	Nepali
	Toba Tek Singh (Pakistan)	Urdu

- After the survey: Recheck

  After the survey was completed, the PMTs and DCs conducted two types of rechecks: 1) desk recheck of all survey booklets in which rechecking teams verified whether all essential information had been filled in correctly, and 2) field recheck during which PMTs and DCs revisited selected communities to ensure that field enumerators had collected information correctly. Some communities were selected purposively based on feedback from the desk recheck, and others were sampled randomly for field recheck.

If the recheck process revealed that the survey did not meet quality standards, the community could be resurveyed.

Overall, 79% of surveyed communities were field monitored, field rechecked or both.

Data entry

Data for the survey was recorded in paper survey booklets and subsequently manually entered using a web-based platform. Data entry was rechecked for every second household. If more than 3 data entry mistakes were found in a community, the data for the entire community was re-entered.

5. Readers' guide to ICAN 2019 survey findings

Overview

ICAN 2019 uses a simple-to-use assessment tool, administered one-on-one with children in their homes. The same tool is used with all children in the age group of 5-16.

ICAN 2019 data from the first round of large-scale household-based implementation, described in the preceding section of this report, provides a snapshot of foundational numeracy in one rural district in each of the 13 participating countries. The sampling strategy generates a representative picture only of the sampled district. Therefore, **ICAN 2019 data from this round cannot be used as a proxy for national estimates or to compare countries.** Rather, this exercise aimed to demonstrate proof of concept in two ways:

- To demonstrate the feasibility of using a common assessment framework and set of tools across very different country contexts; and
- To highlight the ways in which ICAN can be used to generate estimates that respond to important questions confronting countries in the Global South.

In the following sections we provide illustrative examples of how ICAN can provide important evidence with which to answer questions regarding children's foundational numeracy.

Illustrative comparisons using ICAN 2019 data

ICAN 2019 was implemented in 13 countries, but given the limited scale of implementation in each country, the intention in this first round of implementation was to understand the kinds of comparisons that the use of ICAN on scale facilitates, rather than to compare these specific districts. Therefore, **Section 6 of this report presents comparative data that has been anonymised; districts are referenced as Location 1, Location 2 and so on.** Each page poses a question; displays evidence using ICAN 2019 data that speaks to that question; and summarises what this evidence tells us. The examples provided are intended to illustrate some of the ways in which data from the ICAN assessment tool and contextual questionnaires can be used.

District estimates

Finally, **Section 7 presents ICAN 2019 data from individual districts as a snapshot of enrolment and learning in those specific districts.** Results are shown for a standardised set of indicators.

6.
Illustrative comparisons using ICAN 2019 data

What proportion of children meet the SDG 4.1.1 (a) numeracy criteria for class 2 or 3?

Chart 1a

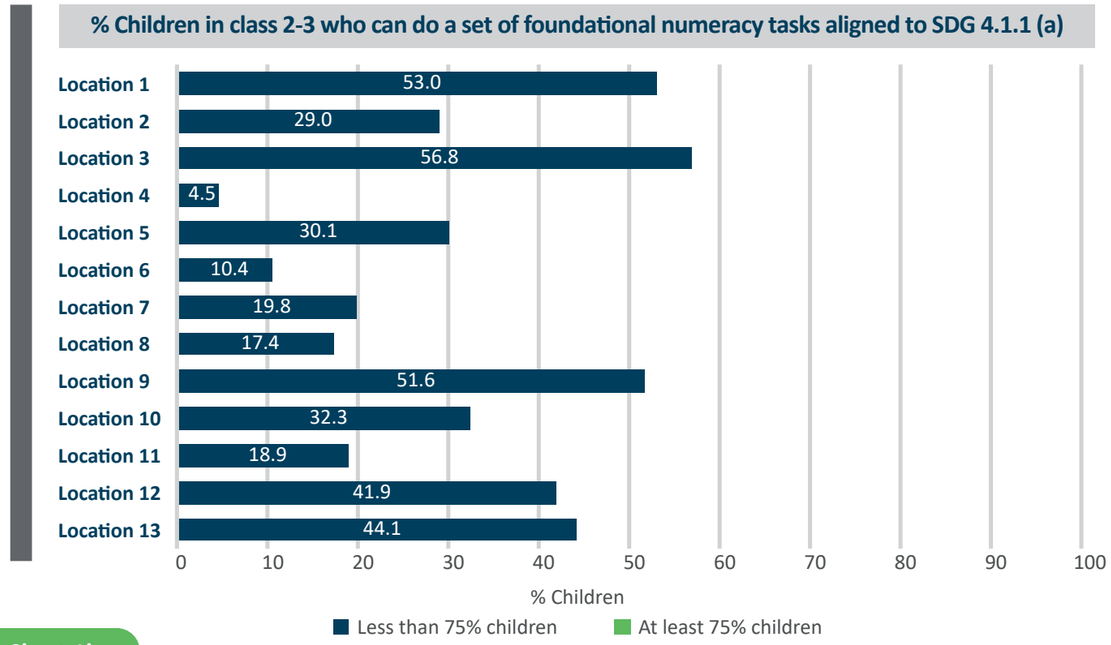
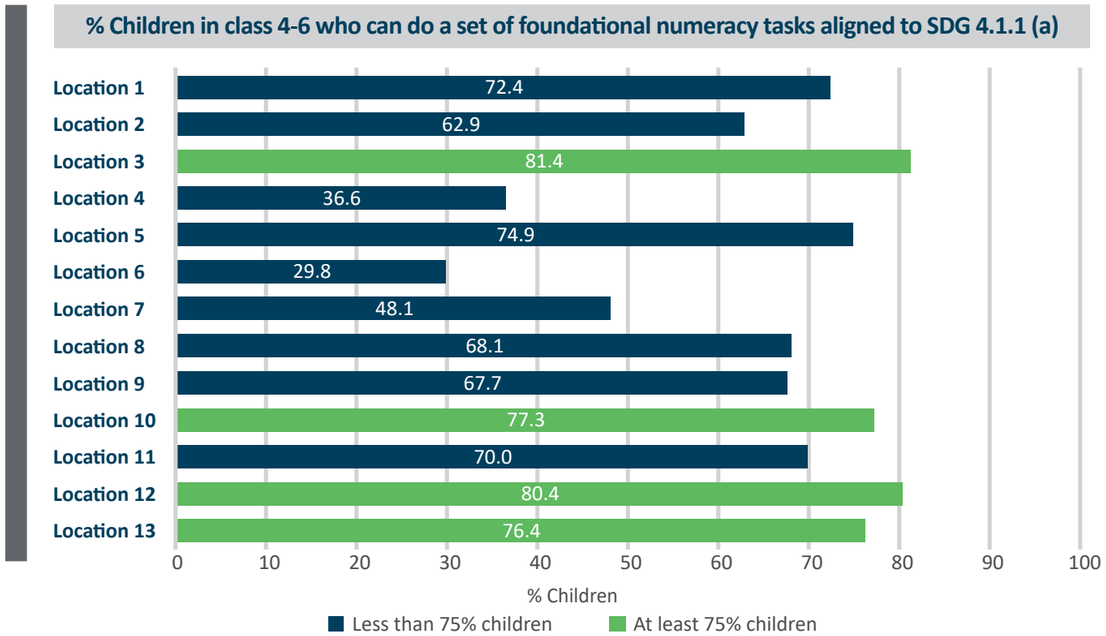
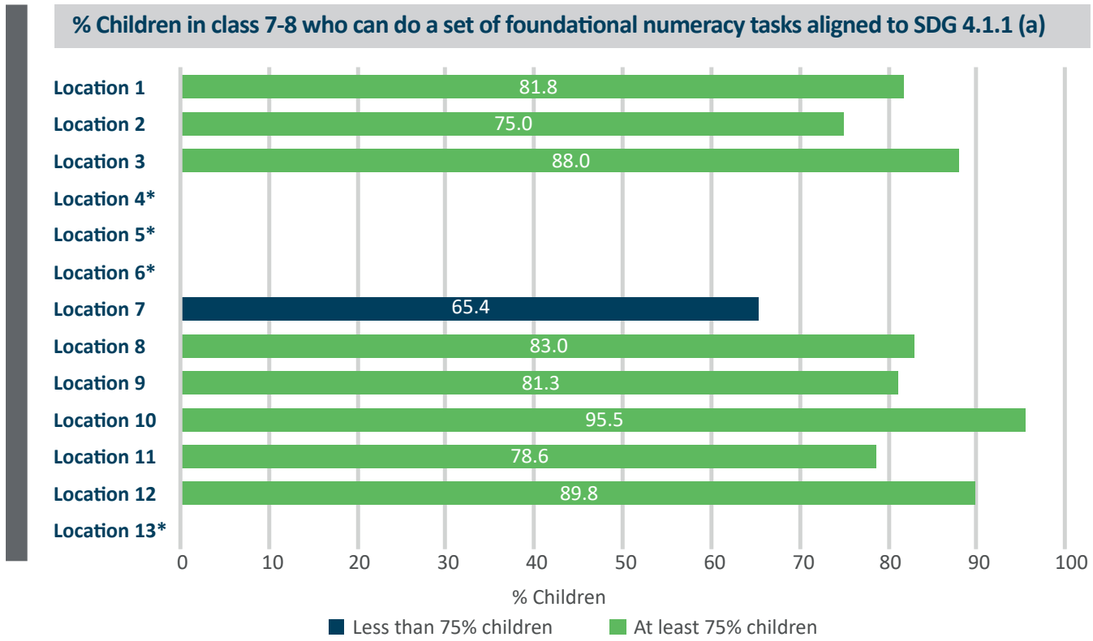


Chart 1b



These are illustrative graphs. Because ICAN 2019 was conducted in only one district in each country, survey locations have been anonymised.

Chart 1c



These are illustrative graphs. Because ICAN 2019 was conducted in only one district in each country, survey locations have been anonymised.

* Insufficient sample size

The minimum proficiency level descriptor for numeracy under SDG 4.1.1 (a) expects students to demonstrate skills in number sense and computation, shape recognition and spatial orientation in class 2 or 3.

Chart 1 shows the proportion of children in class 2-3 (chart 1a), class 4-6 (chart 1b) and class 7-8 (chart 1c) who are able to do a set of foundational numeracy tasks that proxy the minimum proficiency level requirements for SDG 4.1.1 (a):

- At least 1 task each on spatial orientation, shape recognition, measurement, and number recognition; as well as
- At least 3 simple number operations.[1]

Charts 1a, 1b and 1c also identify the class group by when at least 75% children in a given location are able to do this set of tasks (green bars).

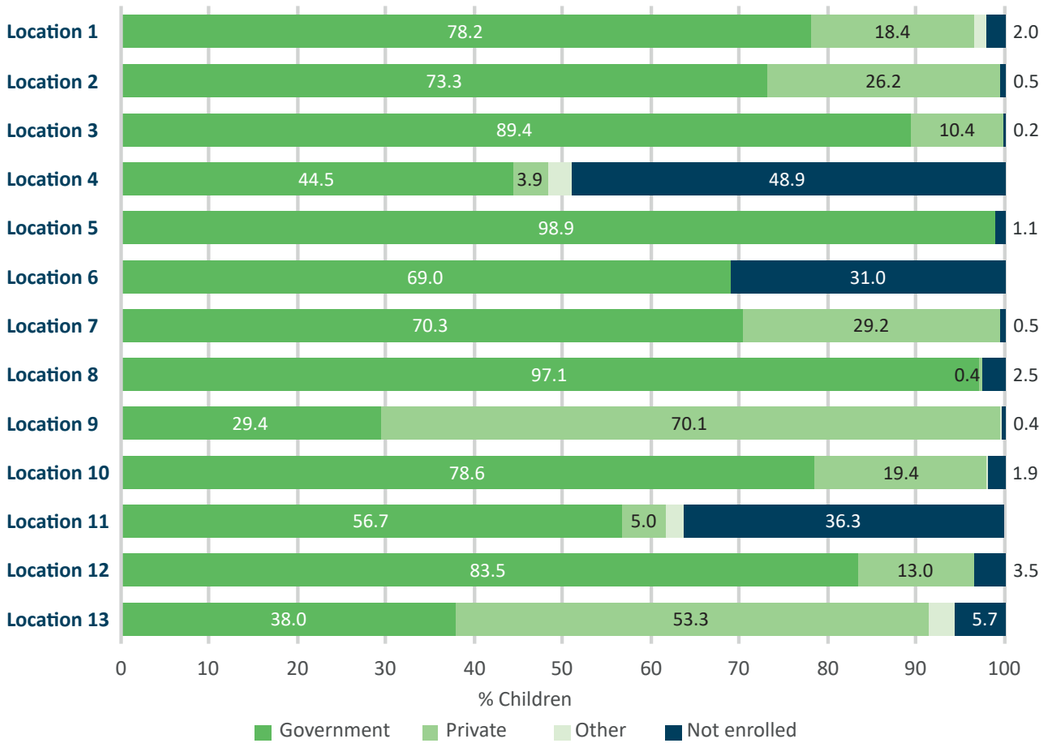
- In class 2-3, no location meets this criterion: the proportion of children who can do these tasks ranges from over 55% in Location 3 to only about 5% in Location 4.
- Even in class 4-6, only 4 locations meet the criterion: Location 3, Location 10, Location 12 and Location 13.
- In the 8 locations for which sufficient data is available, it is only by class 7-8 that all locations (except one, Location 7) meet the 75% criterion. But even in these classes, many children are still unable to do numeracy tasks expected in class 2 or 3.

[1]See pages 9-11 for a complete set of ICAN assessment tasks.

It has been 20 years since the Millennium Development Goals called for universal primary education. What is the status today?

Chart 2

% Children age 6-10 enrolled in different types of schools and children not enrolled



These are illustrative graphs. Because ICAN 2019 was conducted in only one district in each country, survey locations have been anonymised.

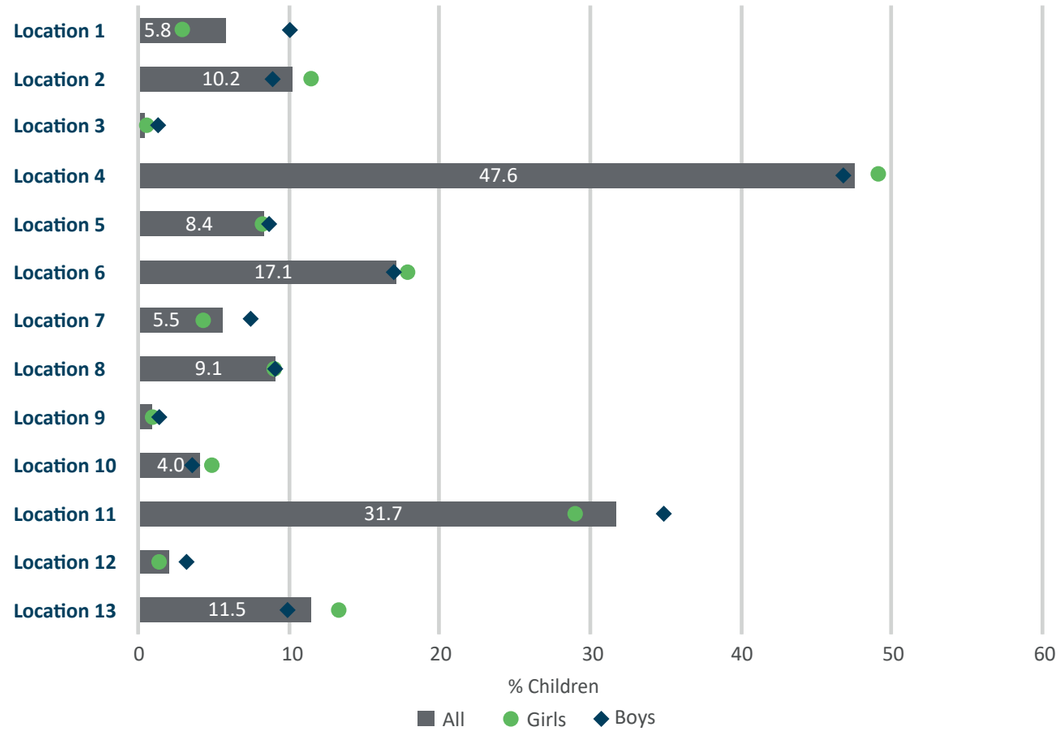
Adopted in the year 2000, the Millennium Development Goals (MDGs) created a push for universal access to education. Since then, there have been global and national efforts to expand school enrolments. Chart 2 explores enrolment patterns among children in the age group of 6-10 years, which is the primary school-going age group in most countries.

- Over 95% children in the age group of 6-10 years are enrolled in some type of school in most locations except Location 4, Location 6, Location 11 and Location 13.
- In Location 4, almost 50% children in this age group are out of school. This proportion is also large in Location 11 (over 35%) and in Location 6 (over 30%).
- In Location 9, 70% children are enrolled in private schools. This proportion is over 50% in Location 13 and around 30% in Location 7. In Location 5 and Location 8, on the other hand, almost all children in the age group of 6-10 years are enrolled in government schools.

Are older girls less likely to be in school than older boys?

Chart 3

% Children age 11-16 not enrolled, by sex



These are illustrative graphs. Because ICAN 2019 was conducted in only one district in each country, survey locations have been anonymised.

The ongoing COVID-19 pandemic will affect both the demand for and the supply of schooling. Adolescents and girls are likely to be the most affected.

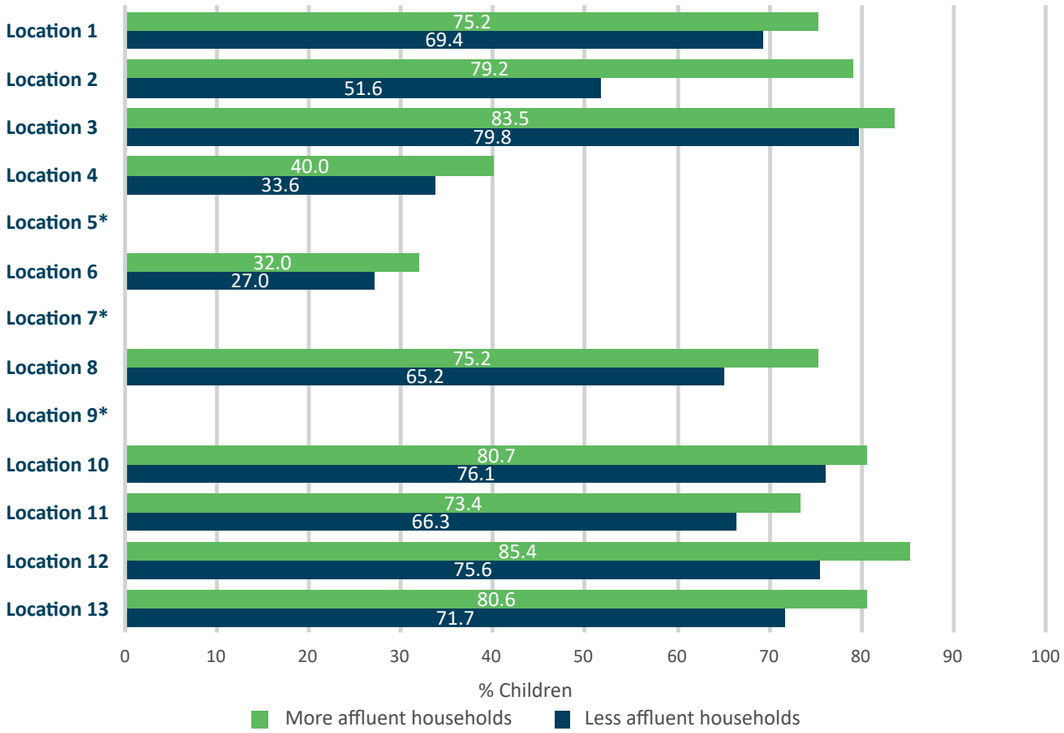
Household-based implementation of ICAN on scale is useful to monitor enrolment patterns as well as foundational numeracy. Chart 3 explores the extent to which older children are out of school, and whether there are differences in this proportion by sex.

- In Location 3 and Location 9, very few children in this older age group are out of school.
- In Location 4, almost half of all children in the age group 11-16 years are not enrolled in school. In Location 11, this proportion is over 30%; and in Location 6, it is over 15%.
- In most locations, gender gaps in enrolment are small, except for Location 1 and Location 11 where there is a difference of more than 5 percentage points between boys and girls. In both cases there are more boys out of school than girls.

Does foundational numeracy vary by household affluence?

Chart 4

% Children in class 4-6 who can do a set of foundational numeracy tasks aligned to SDG 4.1.1 (a), by household affluence



These are illustrative graphs. Because ICAN 2019 was conducted in only one district in each country, survey locations have been anonymised.

* Insufficient sample size

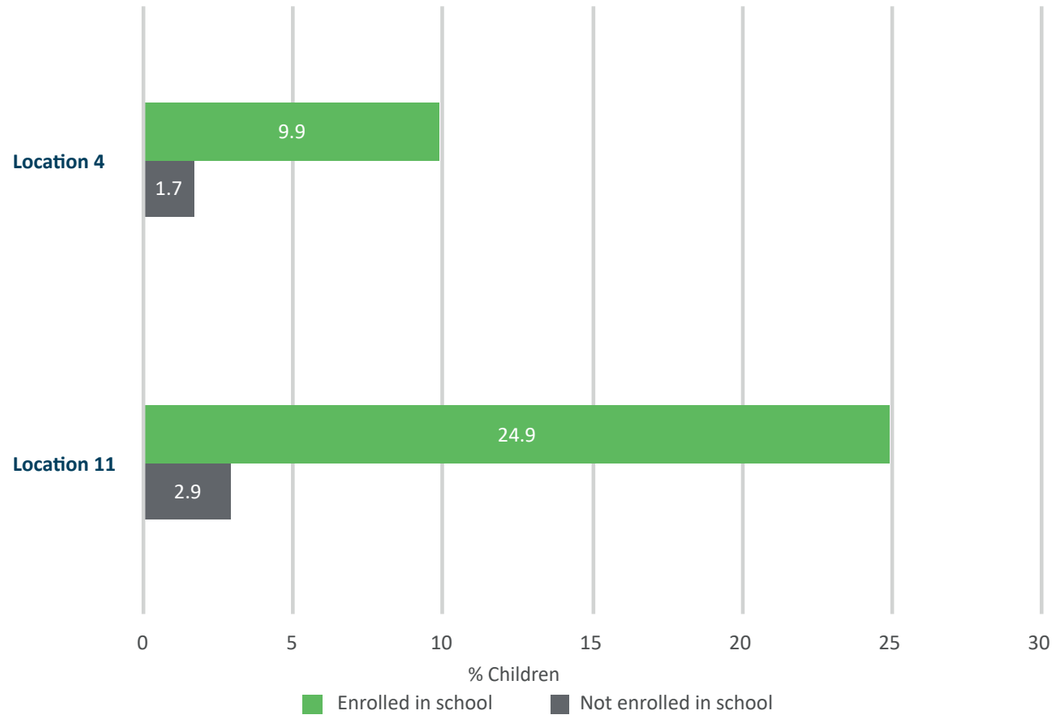
ICAN 2019 was conducted in households, enabling collection of information on selected facilities and assets in each sampled household. Chart 4 explores the disparities between children from more affluent and less affluent households in class 4-6 in terms of performance on foundational numeracy tasks aligned to the minimum proficiency criteria for SDG 4.1.1 (a). Affluence categories are based on household asset ownership.

- In all the locations for which sufficient data is available, except in Location 3 and Location 10, there is a gap of at least 5 percentage points in the proportion of children from less and more affluent households who are able to do this set of tasks. In all cases, children from more affluent households perform better.
- In Location 2, this gap is more than 25 percentage points, followed by almost 10 percentage points in Location 8 and Location 12.
- Even among class 4-6 children from more affluent households, large proportions are unable to do foundational numeracy tasks expected by class 2 or 3.

Does foundational numeracy vary with enrolment status?

Chart 5

% Children age 8-10 years who can do a set of foundational numeracy tasks aligned to SDG 4.1.1 (a), by enrolment status



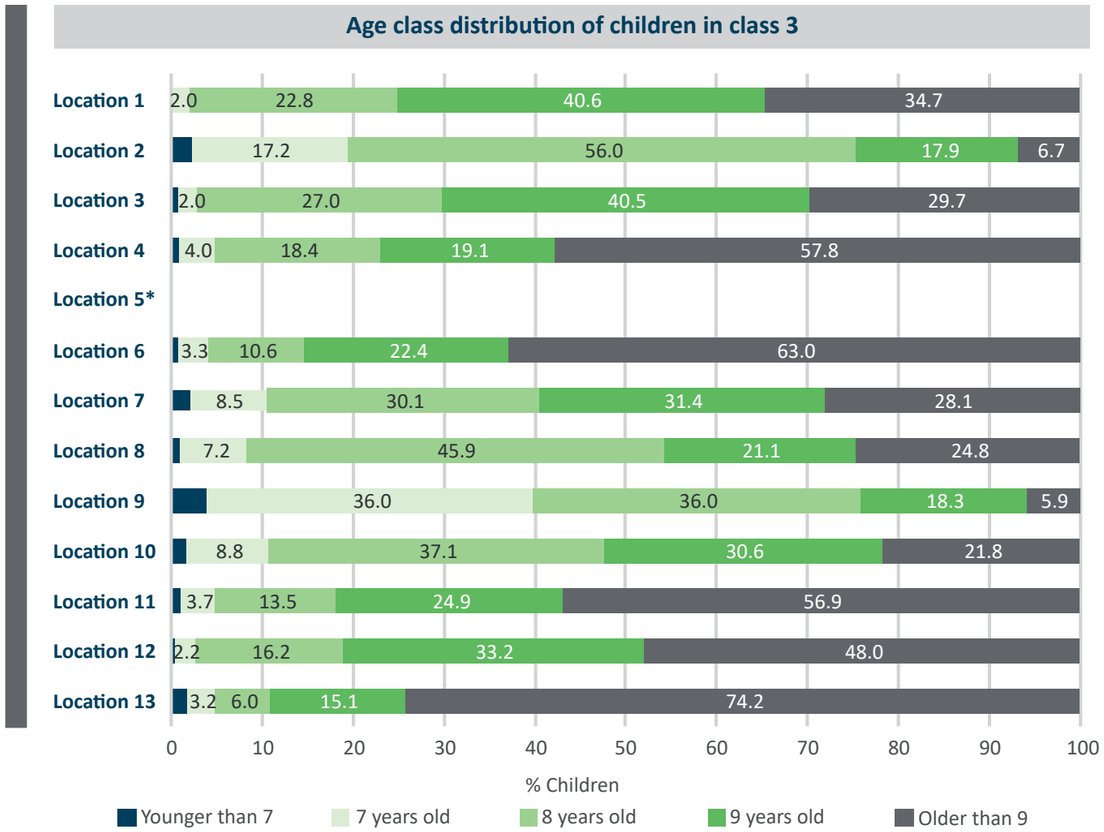
These are illustrative graphs. Because ICAN 2019 was conducted in only one district in each country, survey locations have been anonymised.

Because ICAN 2019 was administered in the households, it reached all children in the target age group of 5-16 years in sampled households, regardless of enrolment status. In Location 4 and Location 11 over 40% and 30% children, respectively in the age group of 8-10 years are not enrolled in school. For these two locations, chart 5 explores learning disparities between children who are enrolled and those who are not in terms of performance on foundational numeracy tasks aligned to the minimum proficiency requirements for SDG 4.1.1 (a).

- In Location 11, 25% of enrolled children in the age group 8-10 years can do foundational numeracy tasks. This proportion is 10% in Location 4.
- In both these locations, less than 3% children aged 8-10 years who are not enrolled in school can do foundational numeracy tasks. These out of school children need to be included in discussions on learning.

Are children in the same class of the same age?

Chart 6



These are illustrative graphs. Because ICAN 2019 was conducted in only one district in each country, survey locations have been anonymised.
* Insufficient sample size

School curricula, teaching-learning materials, and teacher training are usually designed based on the assumption that children in a given class are of the same age. Wider age bands imply additional challenges for both teachers and learners. Chart 6 explores children's age distribution in class 3.

- Among the 12 locations for which sufficient data is available, there is no location where at least 75% of all children in class 3 are the same age.
- In location 7, for example, close to one in every three children is 8 years old, a similar proportion is 9 years old and almost as many are older than 9. But at the same time, one out of ten children is younger than 8.
- Locations vary enormously in age distribution. In location 9, for example, about three quarters of class 3 children are younger than 9 while in Location 13, the same proportion is older than 9.

7. District estimates

Arusha Rural (Tanzania)

In Tanzania, ICAN 2019 was conducted in Arusha Rural district, in the Arusha Region. The survey reached a total of 60 randomly selected rural communities, 1198 households and assessed 1655 children in the age group of 5 to 16 years. The sample is representative only of this district.

Children were asked to do a variety of numeracy tasks. All tasks were done one-on-one with children in their homes.

The data is presented in three sections:

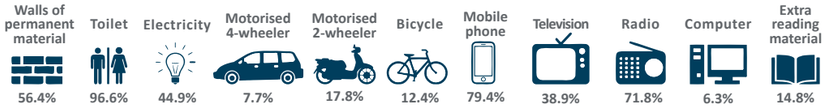
- **About the district:** Provides brief details about the surveyed district and summarises selected characteristics of sampled households.
- **Enrolment:** Presents data on children's pre-school and school enrolment and the types of schools children are enrolled in, by age and class.
- **Learning:** Presents data in three sub-sections:
  1) Performance of children in class 2-3 on selected numeracy tasks which can be mapped to the minimum proficiency level requirements for SDG 4.1.1 (a). Children's ability to do these tasks in higher classes is also shown.
  2) Performance of children in class 2-3, class 4-6 and class 7-8 on number recognition, number operation and word problem tasks.
  3) Performance of children in class 4-6 and class 7-8 on selected tasks that assess the ability to apply numeracy concepts.

ABOUT ARUSHA RURAL

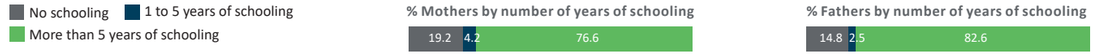
Tanzania is divided into 31 regions and 169 districts, which are further subdivided into divisions, and then into wards. Wards are divided into villages in rural areas and streets in urban centres. Villages are further subdivided into hamlets, the lowest level of administration.

Arusha Rural district is located in the Arusha Region, in northern Tanzania on the border with Kenya. Arusha Rural district has a total area of 1,547 km² and a population of 323,198. The main economic activities are tourism, livestock farming, maize, cereal and cassava production, and fruit farming. The district ranked 21 out of 189 councils in Standard 7 national examination results of 2019. According to the 2015 Uwezo household survey, pass rate for numeracy test among children age 9-13 years in Arusha Rural was 48% while the national average was 40%. Arusha is a popular safari destination and center of Maasai culture.

Household characteristics



Parents' education



ENROLMENT

Chart 1: % Children age 5-6 enrolled in different types of pre-schools and schools

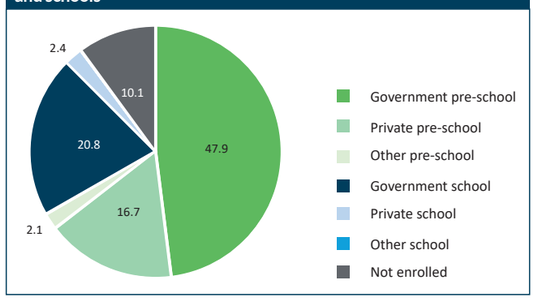


Table 1: % Children enrolled in different types of schools, by age group and sex

Age group	Government	Private	Other	Not in school	Total
Age 6-16: All	86.8	10.5	0.0	2.7	100
Age 6-16: Girls	88.1	10.1	0.0	1.8	100
Age 6-16: Boys	85.3	11.0	0.0	3.7	100
Age 6-10: All	83.5	13.0	0.0	3.5	100
Age 6-10: Girls	83.8	13.7	0.0	2.5	100
Age 6-10: Boys	83.2	12.4	0.0	4.5	100
Age 11-16: All	89.5	8.4	0.0	2.1	100
Age 11-16: Girls	91.5	7.3	0.0	1.3	100
Age 11-16: Boys	87.3	9.8	0.0	3.0	100

'Other' includes children going to religious or community schools.
'Not in school' includes children who never enrolled or have dropped out.

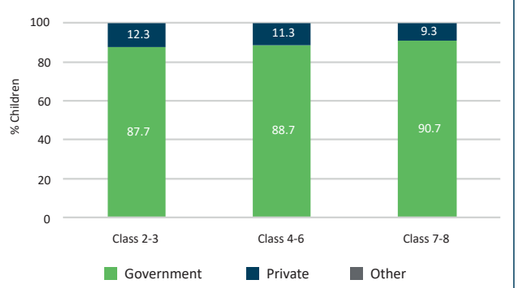
Table 2: Age-class distribution

% Children in each class, by age

Class \ Age	5	6	7	8	9	10	11	12	13	14	15	16	Total
Class 1	4.3	26.4	43.8	14.9	10.6								100
Class 2	2.8		15.7	30.7	22.2	12.9	8.1	7.7					100
Class 3	2.6			16.2	33.2	27.1	7.9	7.0	6.1				100
Class 4	0.5			5.1	12.3	24.6	24.1	15.4	9.7	8.2			100
Class 5	4.5					12.2	32.1	23.7	18.0	5.8	3.8		100
Class 6	4.5						12.3	36.1	24.5	12.3	7.1	3.2	100
Class 7	5.2							9.7	31.0	27.7	14.8	11.6	100
Class 8	4.0								20.8	38.4	24.8	12.0	100

This table shows the age distribution for each class. For example, of all children in class 3, 33.2% children are 9 years old but there are also 16.2% who are 8 years old, 27.1% who are 10 years old and 21% who are 11 years or older.

Chart 2: % Children enrolled in different types of schools, by class



Arusha Rural (Tanzania)

LEARNING

See pages 9-11 for a complete set of ICAN assessment tasks.

Performance on tasks mapped to the minimum proficiency level requirements for SDG 4.1.1 (a)

The minimum proficiency level descriptor for numeracy under SDG 4.1.1 (a) for class 2 or 3 requires students to demonstrate skills in number sense and computation, shape recognition and spatial orientation.

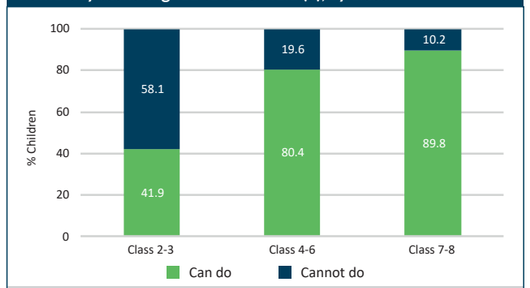
Table 3: % Children in class 2-3 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Spatial orientation	0.7	98.3	93.5	92.1
Shape recognition	5.0	89.0	92.0	84.8
Measurement	0.7	98.5	96.3	95.0

Table 3 shows how children in class 2-3 perform on spatial orientation, shape recognition and measurement tasks. In each of these task categories, children were given two tasks; Task 1 was usually easier than Task 2. The table shows the proportion of children who could not do either task correctly; those who could do the easier task; those who could do the more difficult task; and those who could do both tasks correctly.

Chart 3 shows how foundational numeracy skills progress with class level. It shows the proportion of children in class 2-3, class 4-6 and class 7-8 who can do a set of foundational numeracy tasks that proxy the minimum proficiency level requirements for SDG 4.1.1 (a).

Chart 3: % Children who can do a set of foundational numeracy tasks aligned to SDG 4.1.1 (a), by class



- At least 1 task each on spatial orientation, shape recognition, measurement, and number recognition; as well as
- At least 3 simple number operations.

Performance on number recognition, number operation and word problem tasks

Table 4: % Children who can do number recognition, number operation and word problem tasks, by class

Class	Number recognition		Simple number operations				Advanced number operations				Word problems	
	1-9	10-99	Addition without carry-over	Subtraction without borrow	Single digit multiplication	Single digit division	Addition with carry-over	Subtraction with borrow	Two-digit by one-digit multiplication	Two-digit by one-digit division with remainder	Subtraction	Division
Class 2-3	92.1	75.5	74.2	67.2	44.1	29.2	46.2	35.9	17.9	9.1	28.2	6.2
Class 4-6	96.8	91.5	90.3	87.1	84.5	68.2	72.8	63.3	53.2	33.6	57.1	33.4
Class 7-8	96.0	93.3	96.9	92.4	92.9	81.8	86.7	80.4	74.3	58.0	76.0	53.5

ICAN includes tasks on number recognition at two levels: 1) Identifying numbers from 1-9; and 2) identifying numbers from 10-99. Similarly, it includes tasks on all four number operations (addition, subtraction, multiplication and division) at two levels: 1) Simple number operations without carry-over, borrow and remainder; and 2) Advanced number operations with carry-over, borrow and remainder. Word problems on subtraction and division are also included. Table 4 shows how the performance of children progresses with class level on these number knowledge tasks.

Performance on selected tasks that assess the ability to apply numeracy concepts

Table 5: % Children in class 4-6 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	2.7	96.1	86.4	85.0
Telling time	23.7	70.6	61.6	55.5
Telling day and date	13.4	82.6	69.2	64.5

Table 6: % Children in class 7-8 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	2.2	96.0	91.6	89.8
Telling time	19.9	76.8	71.1	66.8
Telling day and date	7.1	91.6	78.2	76.6

For class 4-6 and class 7-8, children's ability to do tasks requiring application of numeracy concepts is shown in Tables 5 and 6, respectively. This includes two tasks each on reading a simple data display, telling time and telling day and date from a calendar. Task 1 was usually easier than Task 2.

Larde (Mozambique)

In Mozambique, ICAN 2019 was conducted in Larde district, in the province of Nampula. The survey reached a total of 60 randomly selected rural communities, 1200 households and assessed 1630 children in the age group of 5 to 16 years. The sample is representative only of this district.

Children were asked to do a variety of numeracy tasks. All tasks were done one-on-one with children in their homes.

The data is presented in three sections:

- **About the district:** Provides brief details about the surveyed district and summarises selected characteristics of sampled households.
- **Enrolment:** Presents data on children's pre-school and school enrolment and the types of schools children are enrolled in, by age and class.
- **Learning:** Presents data in three sub-sections:
  1) Performance of children in class 2-3 on selected numeracy tasks which can be mapped to the minimum proficiency level requirements for SDG 4.1.1 (a). Children's ability to do these tasks in higher classes is also shown.
  2) Performance of children in class 2-3, class 4-6 and class 7-8 on number recognition, number operation and word problem tasks.
  3) Performance of children in class 4-6 and class 7-8 on selected tasks that assess the ability to apply numeracy concepts.

ABOUT LARDE

Mozambique is divided into 11 provinces, 129 districts and 405 administrative posts.

Larde district is one of the 23 districts in the province of Nampula. It is located in the south of the province along the coast of the Indian Ocean. According to the 2017 Census, the district covers a total area of 2,458 km² and a population of 98,385 inhabitants. The main economic activities are agriculture, fishing and mining. Larde is home to KENMARE, a mining company that operates the Moma Titanium Mine. KENMARE is one of the world's largest producers of heavy sands and is the largest employer in the district. According to the 2017 TPC Mozambique assessment, 5.7% children aged 7 to 16 can solve a simple class 2 addition operation in Larde compared to 6% children in the Nampula province.

Household characteristics

Households with:	Walls of permanent material	Toilet	Electricity	Motorised 4-wheeler	Motorised 2-wheeler	Bicycle	Mobile phone	Television	Radio	Computer	Extra reading material
	7.8%	97.8%	18.1%	1.1%	16.8%	30.6%	38.7%	17.9%	26.5%	2.3%	1.7%

Parents' education

No schooling | 1 to 5 years of schooling | More than 5 years of schooling

% Mothers by number of years of schooling

% Fathers by number of years of schooling

ENROLMENT

Chart 1: % Children age 5-6 enrolled in different types of pre-schools and schools

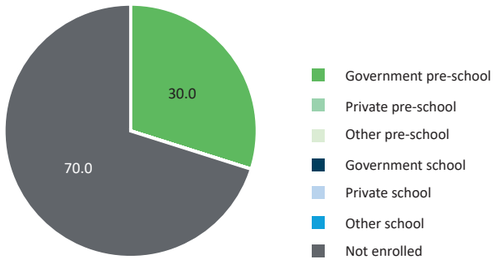


Table 1: % Children enrolled in different types of schools, by age group and sex

Age group	Government	Private	Other	Not in school	Total
Age 6-16: All	74.4	0.0	0.0	25.7	100
Age 6-16: Girls	71.9	0.0	0.0	28.1	100
Age 6-16: Boys	76.6	0.0	0.0	23.4	100
Age 6-10: All	69.0	0.0	0.0	31.0	100
Age 6-10: Girls	66.0	0.0	0.0	34.0	100
Age 6-10: Boys	72.0	0.0	0.0	28.0	100
Age 11-16: All	82.9	0.0	0.0	17.1	100
Age 11-16: Girls	82.5	0.0	0.0	17.5	100
Age 11-16: Boys	83.2	0.0	0.0	16.8	100

'Other' includes children going to religious or community schools.
'Not in school' includes children who never enrolled or have dropped out.

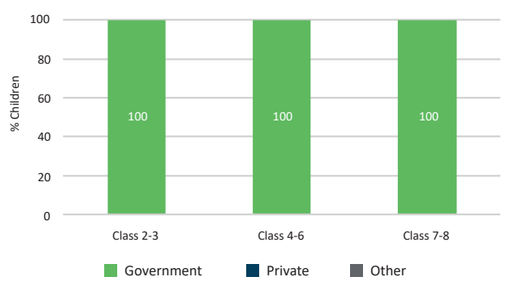
Table 2: Age-class distribution

% Children in each class, by age

Class \ Age	5	6	7	8	9	10	11	12	13	14	15	16	Total
Class 1	4.6	25.6	33.6	14.0	7.4	14.8							100
Class 2	4.4		18.1	22.1	18.5	12.7	8.7	5.4	5.4	4.7			100
Class 3	4.1			10.6	22.4	18.3	15.5	9.4	11.0	5.3	3.7		100
Class 4	3.7				9.8	17.1	22.0	13.4	11.6	9.8	7.9	4.9	100
Class 5	4.6					11.9	16.5	11.0	19.3	13.8	11.9	11.0	100
Class 6	Insufficient sample size												
Class 7													
Class 8													

This table shows the age distribution for each class. For example, of all children in class 3, 22.4% children are 9 years old but there are also 10.6% who are 8 years old, 18.3% who are 10 years old and 44.8% who are 11 years or older.

Chart 2: % Children enrolled in different types of schools, by class



LEARNING

See pages 9-11 for a complete set of ICAN assessment tasks.

Performance on tasks mapped to the minimum proficiency level requirements for SDG 4.1.1 (a)

The minimum proficiency level descriptor for numeracy under SDG 4.1.1 (a) for class 2 or 3 requires students to demonstrate skills in number sense and computation, shape recognition and spatial orientation.

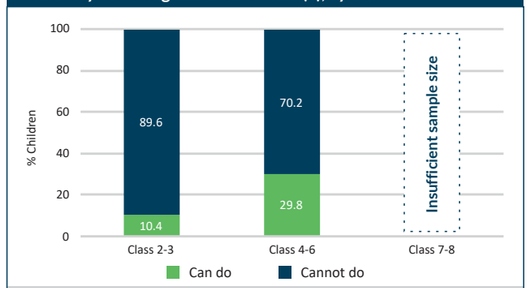
Table 3: % Children in class 2-3 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Spatial orientation	1.5	95.2	92.0	88.7
Shape recognition	11.3	79.6	72.3	63.0
Measurement	1.3	96.3	94.6	92.2

Table 3 shows how children in class 2-3 perform on spatial orientation, shape recognition and measurement tasks. In each of these task categories, children were given two tasks; Task 1 was usually easier than Task 2. The table shows the proportion of children who could not do either task correctly; those who could do the easier task; those who could do the more difficult task; and those who could do both tasks correctly.

Chart 3 shows how foundational numeracy skills progress with class level. It shows the proportion of children in class 2-3, class 4-6 and class 7-8 who can do a set of foundational numeracy tasks that proxy the minimum proficiency level requirements for SDG 4.1.1 (a).

Chart 3: % Children who can do a set of foundational numeracy tasks aligned to SDG 4.1.1 (a), by class



- At least 1 task each on spatial orientation, shape recognition, measurement, and number recognition; as well as
- At least 3 simple number operations.

Performance on number recognition, number operation and word problem tasks

Table 4: % Children who can do number recognition, number operation and word problem tasks, by class

Class	Number recognition		Simple number operations				Advanced number operations				Word problems	
	1-9	10-99	Addition without carry-over	Subtraction without borrow	Single digit multiplication	Single digit division	Addition with carry-over	Subtraction with borrow	Two-digit by one-digit multiplication	Two-digit by one-digit division with remainder	Subtraction	Division
Class 2-3	80.4	36.4	23.7	15.0	19.8	18.7	6.3	4.4	3.5	3.9	2.2	2.6
Class 4-6	90.5	54.8	48.5	36.3	34.9	33.6	20.7	20.7	15.6	13.9	14.2	12.6
Class 7-8	Insufficient sample size											

ICAN includes tasks on number recognition at two levels: 1) Identifying numbers from 1-9; and 2) identifying numbers from 10-99. Similarly, it includes tasks on all four number operations (addition, subtraction, multiplication and division) at two levels: 1) Simple number operations without carry-over, borrow and remainder; and 2) Advanced number operations with carry-over, borrow and remainder. Word problems on subtraction and division are also included. Table 4 shows how the performance of children progresses with class level on these number knowledge tasks.

Performance on selected tasks that assess the ability to apply numeracy concepts

Table 5: % Children in class 4-6 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	5.8	91.9	77.6	75.3
Telling time	63.4	29.2	22.3	14.6
Telling day and date	50.5	33.7	41.0	25.1

Table 6: % Children in class 7-8 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	Insufficient sample size			
Telling time				
Telling day and date				

For class 4-6 and class 7-8, children's ability to do tasks requiring application of numeracy concepts is shown in Tables 5 and 6, respectively. This includes two tasks each on reading a simple data display, telling time and telling day and date from a calendar. Task 1 was usually easier than Task 2.

Mubende (Uganda)

In Uganda, ICAN 2019 was conducted in Mubende district, in the Central Region. The survey reached a total of 60 randomly selected rural communities, 1200 households and assessed 1853 children in the age group of 5 to 16 years. The sample is representative only of this district.

Children were asked to do a variety of numeracy tasks. All tasks were done one-on-one with children in their homes.

The data is presented in three sections:

- **About the district:** Provides brief details about the surveyed district and summarises selected characteristics of sampled households.
- **Enrolment:** Presents data on children's pre-school and school enrolment and the types of schools children are enrolled in, by age and class.
- **Learning:** Presents data in three sub-sections:
  1) Performance of children in class 2-3 on selected numeracy tasks which can be mapped to the minimum proficiency level requirements for SDG 4.1.1 (a). Children's ability to do these tasks in higher classes is also shown.
  2) Performance of children in class 2-3, class 4-6 and class 7-8 on number recognition, number operation and word problem tasks.
  3) Performance of children in class 4-6 and class 7-8 on selected tasks that assess the ability to apply numeracy concepts.

ABOUT MUBENDE

Uganda is demarcated into 134 districts including the capital city of Kampala. Districts are further subdivided into sub-counties, parishes and then into villages as the lowest level of administration.

Mubende district is located in the Central Region of Uganda, with a total area of 4,620 km² and a population of 684,348. The major economic activity is agriculture focusing mostly on crop farming. In 2009, Mubende was identified by the Ministry of Education as one of the 12 worst performing districts in Uganda and selected to participate in the Ministry's Quality Enhancement Initiatives (QEI) program. Assessments have demonstrated improvements, with the 2016 Uwezo Uganda assessment ranking Mubende among the average performing districts, with 31% of its pupils in classes P3-P7 competent in English and numeracy tasks of P2 level as compared to the national average of 32%. The district is a popular tourist destination.

Household characteristics

Households with:

Walls of permanent material	Toilet	Electricity	Motorised 4-wheeler	Motorised 2-wheeler	Bicycle	Mobile phone	Television	Radio	Computer	Extra reading material
51.8%	95.3%	6.4%	2.3%	21.3%	21.0%	68.8%	12.5%	63.4%	0.8%	16.9%

Parents' education

No schooling | 1 to 5 years of schooling | More than 5 years of schooling

% Mothers by number of years of schooling

% Fathers by number of years of schooling

ENROLMENT

Chart 1: % Children age 5-6 enrolled in different types of pre-schools and schools

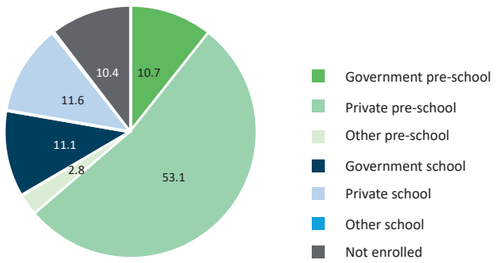


Table 1: % Children enrolled in different types of schools, by age group and sex

Age group	Government	Private	Other	Not in school	Total
Age 6-16: All	41.0	47.4	2.7	8.9	100
Age 6-16: Girls	39.4	47.5	3.0	10.2	100
Age 6-16: Boys	42.6	47.2	2.5	7.7	100
Age 6-10: All	38.0	53.3	2.9	5.7	100
Age 6-10: Girls	37.3	52.4	4.0	6.3	100
Age 6-10: Boys	38.7	54.1	1.9	5.2	100
Age 11-16: All	43.4	42.6	2.6	11.5	100
Age 11-16: Girls	40.9	43.6	2.2	13.2	100
Age 11-16: Boys	45.8	41.5	2.9	9.7	100

'Other' includes children going to religious or community schools.
'Not in school' includes children who never enrolled or have dropped out.

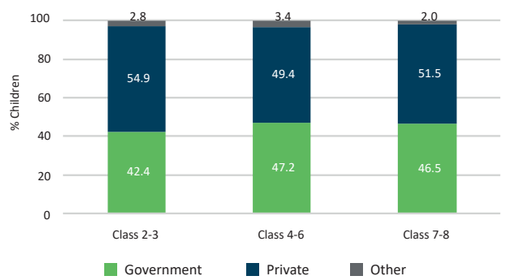
Table 2: Age-class distribution

% Children in each class, by age

Class \ Age	5	6	7	8	9	10	11	12	13	14	15	16	Total
Class 1	11.3	13.5	22.6	20.4	16.3	9.4	6.6						100
Class 2	4.7		8.3	17.4	29.6	21.7	7.9	5.9	4.4				100
Class 3	4.8			6.0	15.1	23.8	16.3	20.6	6.8	5.2	1.6		100
Class 4	4.3				6.0	13.7	15.0	28.3	15.5	10.3	6.4	0.4	100
Class 5	2.2					10.6	11.7	27.2	17.8	19.4	10.0	1.1	100
Class 6	2.1						6.9	16.7	21.5	29.2	16.0	7.6	100
Class 7	Insufficient sample size												
Class 8													

This table shows the age distribution for each class. For example, of all children in class 3, 23.8% children are 10 years old but there are also 15.1% who are 9 years old, 16.3% who are 11 years old and 34.1% who are 12 years or older.

Chart 2: % Children enrolled in different types of schools, by class



Mubende (Uganda)

LEARNING

See pages 9-11 for a complete set of ICAN assessment tasks.

Performance on tasks mapped to the minimum proficiency level requirements for SDG 4.1.1 (a)

The minimum proficiency level descriptor for numeracy under SDG 4.1.1 (a) for class 2 or 3 requires students to demonstrate skills in number sense and computation, shape recognition and spatial orientation.

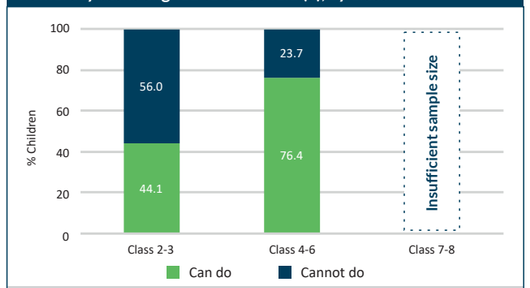
Table 3: % Children in class 2-3 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Spatial orientation	0.9	97.4	91.4	89.7
Shape recognition	6.2	86.8	70.9	63.9
Measurement	0.7	96.9	94.5	92.1

Table 3 shows how children in class 2-3 perform on spatial orientation, shape recognition and measurement tasks. In each of these task categories, children were given two tasks; Task 1 was usually easier than Task 2. The table shows the proportion of children who could not do either task correctly; those who could do the easier task; those who could do the more difficult task; and those who could do both tasks correctly.

Chart 3 shows how foundational numeracy skills progress with class level. It shows the proportion of children in class 2-3, class 4-6 and class 7-8 who can do a set of foundational numeracy tasks that proxy the minimum proficiency level requirements for SDG 4.1.1 (a).

Chart 3: % Children who can do a set of foundational numeracy tasks aligned to SDG 4.1.1 (a), by class



- At least 1 task each on spatial orientation, shape recognition, measurement, and number recognition; as well as
- At least 3 simple number operations.

Performance on number recognition, number operation and word problem tasks

Table 4: % Children who can do number recognition, number operation and word problem tasks, by class

Class	Number recognition		Simple number operations				Advanced number operations				Word problems	
	1-9	10-99	Addition without carry-over	Subtraction without borrow	Single digit multiplication	Single digit division	Addition with carry-over	Subtraction with borrow	Two-digit by one-digit multiplication	Two-digit by one-digit division with remainder	Subtraction	Division
Class 2-3	86.1	71.6	67.0	51.5	47.8	43.4	20.4	9.8	7.8	3.5	9.7	4.1
Class 4-6	95.0	88.6	89.0	81.9	80.3	72.9	62.2	39.2	34.9	14.7	31.0	19.1
Class 7-8	Insufficient sample size											

ICAN includes tasks on number recognition at two levels: 1) Identifying numbers from 1-9; and 2) identifying numbers from 10-99. Similarly, it includes tasks on all four number operations (addition, subtraction, multiplication and division) at two levels: 1) Simple number operations without carry-over, borrow and remainder; and 2) Advanced number operations with carry-over, borrow and remainder. Word problems on subtraction and division are also included. Table 4 shows how the performance of children progresses with class level on these number knowledge tasks.

Performance on selected tasks that assess the ability to apply numeracy concepts

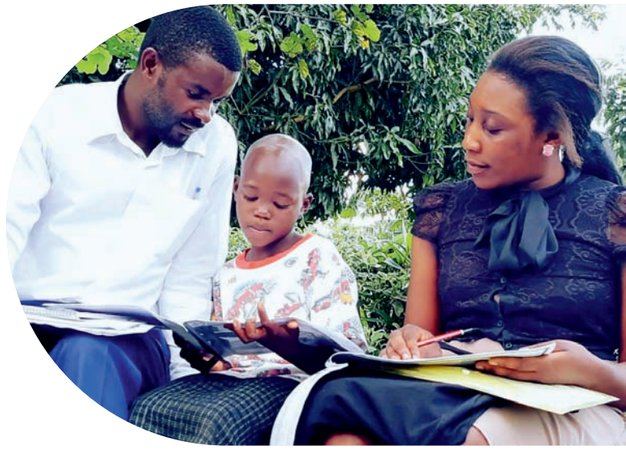
Table 5: % Children in class 4-6 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	7.0	89.4	65.5	61.9
Telling time	36.3	57.3	38.7	32.3
Telling day and date	25.5	64.7	46.2	36.3

Table 6: % Children in class 7-8 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	Insufficient sample size			
Telling time				
Telling day and date				

For class 4-6 and class 7-8, children's ability to do tasks requiring application of numeracy concepts is shown in Tables 5 and 6, respectively. This includes two tasks each on reading a simple data display, telling time and telling day and date from a calendar. Task 1 was usually easier than Task 2.



Mwala (Kenya)

In Kenya, ICAN 2019 was conducted in Mwala sub-county, in the county of Machakos. The survey reached a total of 60 randomly selected rural communities, 1200 households and assessed 1140 children in the age group of 5 to 16 years. The sample is representative only of this sub-county.

Children were asked to do a variety of numeracy tasks. All tasks were done one-on-one with children in their homes.

The data is presented in three sections:

- **About the district:** Provides brief details about the surveyed district and summarises selected characteristics of sampled households.
- **Enrolment:** Presents data on children's pre-school and school enrolment and the types of schools children are enrolled in, by age and class.
- **Learning:** Presents data in three sub-sections:
  1) Performance of children in class 2-3 on selected numeracy tasks which can be mapped to the minimum proficiency level requirements for SDG 4.1.1 (a). Children's ability to do these tasks in higher classes is also shown.
  2) Performance of children in class 2-3, class 4-6 and class 7-8 on number recognition, number operation and word problem tasks.
  3) Performance of children in class 4-6 and class 7-8 on selected tasks that assess the ability to apply numeracy concepts.

ABOUT MWALA

Kenya is divided into 47 counties and 334 sub-counties (spread across 290 constituencies). Sub-counties are further subdivided into locations, and then into sub-locations. The smallest administrative subdivision is a village.

Mwala sub-county is located in Machakos county, in the former eastern province of Kenya. Machakos county borders Nairobi to the East and is 102 km from the capital city. According to the 2019 Census, Mwala sub-county has a total area of 1,020 km² and has a population of 181,896. It is largely a monolingual sub-county. The main economic activities in Mwala are livestock farming and sand harvesting from quarry stones. Maize and other drought-resistant crops, such as sorghum and millet, are popular due to the area's semi-arid state and frequent drought. According to the 2015 Uwezo Kenya assessment, the mean numeracy score for children aged 6-16 years in Mwala sub-county is 56.3% as compared to the national score of 56.2%.

Household characteristics

Households with:

Walls of permanent material	Toilet	Electricity	Motorised 4-wheeler	Motorised 2-wheeler	Bicycle	Mobile phone	Television	Radio	Computer	Extra reading material
96.5%	96.2%	18.0%	4.1%	11.1%	32.9%	91.3%	24.2%	80.2%	2.0%	43.2%

Parents' education

No schooling | 1 to 5 years of schooling | More than 5 years of schooling

ENROLMENT

Chart 1: % Children age 5-6 enrolled in different types of pre-schools and schools

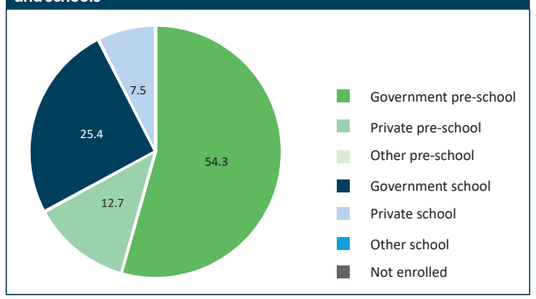


Table 1: % Children enrolled in different types of schools, by age group and sex

Age group	Government	Private	Other	Not in school	Total
Age 6-16: All	93.9	5.8	0.0	0.3	100
Age 6-16: Girls	94.3	5.7	0.0	0.0	100
Age 6-16: Boys	93.5	5.9	0.0	0.6	100
Age 6-10: All	89.4	10.4	0.0	0.2	100
Age 6-10: Girls	90.2	9.8	0.0	0.0	100
Age 6-10: Boys	88.6	11.0	0.0	0.4	100
Age 11-16: All	96.5	3.1	0.0	0.4	100
Age 11-16: Girls	96.7	3.3	0.0	0.0	100
Age 11-16: Boys	96.3	3.0	0.0	0.7	100

'Other' includes children going to religious or community schools.
'Not in school' includes children who never enrolled or have dropped out.

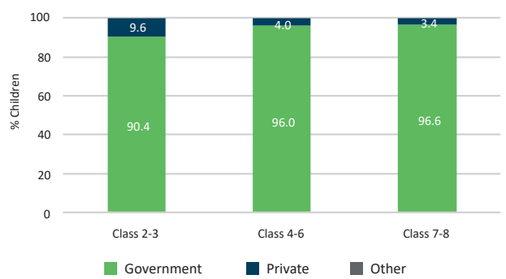
Table 2: Age-class distribution

% Children in each class, by age

Class \ Age	5	6	7	8	9	10	11	12	13	14	15	16	Total
Class 1	11.8	29.4	35.3	11.8	6.7	5.0							100
Class 2	3.8		28.7	38.8	17.1	11.7							100
Class 3	2.7			27.0	40.5	23.0	6.8						100
Class 4	0.7			5.8	20.0	31.0	26.5	11.0	5.0				100
Class 5	3.5					21.6	33.3	23.4	10.5	4.7	3.0		100
Class 6	5.0						14.4	41.9	21.3	11.9	5.6	0.0	100
Class 7	2.8							16.9	35.4	26.4	12.9	5.6	100
Class 8	5.6								16.0	30.4	35.2	12.8	100

This table shows the age distribution for each class. For example, of all children in class 3, 40.5% children are 9 years old but there are also 27% who are 8 years old, 23% who are 10 years old and 6.8% who are 11 years or older.

Chart 2: % Children enrolled in different types of schools, by class



LEARNING

See pages 9-11 for a complete set of ICAN assessment tasks.

Performance on tasks mapped to the minimum proficiency level requirements for SDG 4.1.1 (a)

The minimum proficiency level descriptor for numeracy under SDG 4.1.1 (a) for class 2 or 3 requires students to demonstrate skills in number sense and computation, shape recognition and spatial orientation.

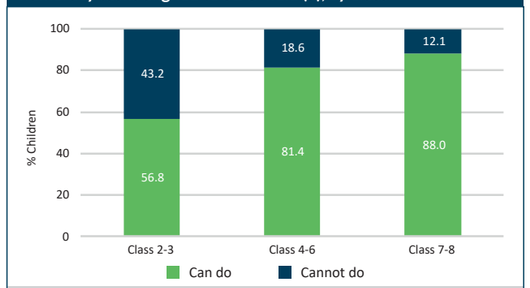
Table 3: % Children in class 2-3 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Spatial orientation	1.9	96.6	85.4	83.5
Shape recognition	1.0	93.2	90.8	84.5
Measurement	1.0	96.1	91.7	87.9

Table 3 shows how children in class 2-3 perform on spatial orientation, shape recognition and measurement tasks. In each of these task categories, children were given two tasks; Task 1 was usually easier than Task 2. The table shows the proportion of children who could not do either task correctly; those who could do the easier task; those who could do the more difficult task; and those who could do both tasks correctly.

Chart 3 shows how foundational numeracy skills progress with class level. It shows the proportion of children in class 2-3, class 4-6 and class 7-8 who can do a set of foundational numeracy tasks that proxy the minimum proficiency level requirements for SDG 4.1.1 (a).

Chart 3: % Children who can do a set of foundational numeracy tasks aligned to SDG 4.1.1 (a), by class



- At least 1 task each on spatial orientation, shape recognition, measurement, and number recognition; as well as
- At least 3 simple number operations.

Performance on number recognition, number operation and word problem tasks

Table 4: % Children who can do number recognition, number operation and word problem tasks, by class

Class	Number recognition		Simple number operations				Advanced number operations				Word problems	
	1-9	10-99	Addition without carry-over	Subtraction without borrow	Single digit multiplication	Single digit division	Addition with carry-over	Subtraction with borrow	Two-digit by one-digit multiplication	Two-digit by one-digit division with remainder	Subtraction	Division
Class 2-3	93.7	91.2	89.8	78.5	56.8	52.5	63.9	31.1	13.8	12.2	29.3	11.4
Class 4-6	94.5	92.6	94.8	90.2	88.3	75.8	86.5	68.0	60.1	34.5	71.8	35.8
Class 7-8	93.3	92.0	95.1	87.1	96.9	94.1	92.4	78.6	84.8	74.6	76.2	73.8

ICAN includes tasks on number recognition at two levels: 1) Identifying numbers from 1-9; and 2) identifying numbers from 10-99. Similarly, it includes tasks on all four number operations (addition, subtraction, multiplication and division) at two levels: 1) Simple number operations without carry-over, borrow and remainder; and 2) Advanced number operations with carry-over, borrow and remainder. Word problems on subtraction and division are also included. Table 4 shows how the performance of children progresses with class level on these number knowledge tasks.

Performance on selected tasks that assess the ability to apply numeracy concepts

Table 5: % Children in class 4-6 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	9.3	87.7	53.4	50.0
Telling time	50.8	41.4	25.1	16.9
Telling day and date	22.1	66.6	55.7	44.3

Table 6: % Children in class 7-8 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	4.9	91.1	71.4	67.4
Telling time	26.3	64.1	55.4	45.5
Telling day and date	8.0	85.6	75.0	67.9

For class 4-6 and class 7-8, children's ability to do tasks requiring application of numeracy concepts is shown in Tables 5 and 6, respectively. This includes two tasks each on reading a simple data display, telling time and telling day and date from a calendar. Task 1 was usually easier than Task 2.

Ikorodu (Nigeria)

In Nigeria, ICAN 2019 was conducted in Ikorodu local government area, in the state of Lagos. The survey reached a total of 60 randomly selected rural communities, 1193 households and assessed 1552 children in the age group of 5 to 16 years. The sample is representative only of this local government area. Children were asked to do a variety of numeracy tasks. All tasks were done one-on-one with children in their homes.

The data is presented in three sections:

- **About the district:** Provides brief details about the surveyed district and summarises selected characteristics of sampled households.
- **Enrolment:** Presents data on children's pre-school and school enrolment and the types of schools children are enrolled in, by age and class.
- **Learning:** Presents data in three sub-sections:
  1) Performance of children in class 2-3 on selected numeracy tasks which can be mapped to the minimum proficiency level requirements for SDG 4.1.1 (a). Children's ability to do these tasks in higher classes is also shown.
  2) Performance of children in class 2-3, class 4-6 and class 7-8 on number recognition, number operation and word problem tasks.
  3) Performance of children in class 4-6 and class 7-8 on selected tasks that assess the ability to apply numeracy concepts.

ABOUT IKORODU

Nigeria is divided into 36 states and one federal capital territory, subdivided into 6 geopolitical zones, which are further subdivided into 774 local government areas.

Ikorodu is a local government area located in Lagos state, southwestern Nigeria. It lies near the Lagos Lagoon, on the Bight of Benin, 23 km northwest of Lagos. According to the 2006 Census, Ikorodu local government has a total area of 345 km² and a population of 535,619. The main economic activities are trading, farming and manufacturing. Ikorodu has a large industrial area containing several manufacturing factories. According to 2017/2018 LEARNigeria assessment data, 65% sampled students in Junior Secondary School 3 (JSS 3, or class 9) in Ikorodu local government area were able to read a story of class 2 level, and only 37% were able to complete a set of 1 by 1-digit multiplication tasks of class 2 level.

Household characteristics

Households with:

Walls of permanent material	Toilet	Electricity	Motorised 4-wheeler	Motorised 2-wheeler	Bicycle	Mobile phone	Television	Radio	Computer	Extra reading material
99.4%	97.6%	100%	11.3%	6.6%	2.1%	74.9%	85.2%	61.1%	25.1%	51.6%

Parents' education

No schooling | 1 to 5 years of schooling | More than 5 years of schooling

% Mothers by number of years of schooling: 9.0 | 1.8 | 89.2

% Fathers by number of years of schooling: 14.2 | 0.3 | 85.5

ENROLMENT

Chart 1: % Children age 5-6 enrolled in different types of pre-schools and schools

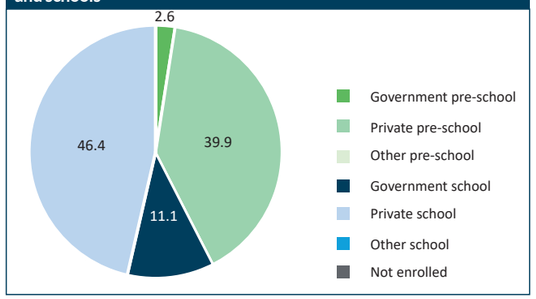


Table 1: % Children enrolled in different types of schools, by age group and sex

Age group	Government	Private	Other	Not in school	Total
Age 6-16: All	43.5	55.8	0.1	0.7	100
Age 6-16: Girls	43.5	55.7	0.1	0.7	100
Age 6-16: Boys	43.5	55.9	0.0	0.7	100
Age 6-10: All	29.4	70.1	0.1	0.4	100
Age 6-10: Girls	31.2	68.1	0.2	0.5	100
Age 6-10: Boys	27.4	72.3	0.0	0.3	100
Age 11-16: All	59.4	39.7	0.0	1.0	100
Age 11-16: Girls	57.8	41.3	0.0	0.8	100
Age 11-16: Boys	60.9	38.0	0.0	1.1	100

'Other' includes children going to religious or community schools.
'Not in school' includes children who never enrolled or have dropped out.

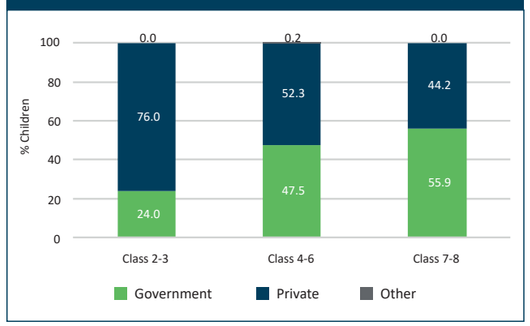
Table 2: Age-class distribution

% Children in each class, by age

Class \ Age	5	6	7	8	9	10	11	12	13	14	15	16	Total
Class 1	29.7	45.8	14.2	5.8	4.5								100
Class 2	8.2	28.3	38.6	16.3	8.7								100
Class 3	3.9		36.0	36.0	18.3	5.9							100
Class 4	3.4		7.4	32.0	33.1	13.7	10.3						100
Class 5	3.4			5.4	30.9	34.2	12.1	10.7	3.4				100
Class 6	5.7				18.0	26.2	18.9	16.4	5.7	4.9	4.1		100
Class 7	6.6					22.5	33.8	16.6	11.3	5.3	4.0		100
Class 8	3.9					9.0	21.3	31.6	16.1	12.9	4.5	0.7	100

This table shows the age distribution for each class. For example, of all children in class 3, 36% children are 8 years old but there are also 36% who are 7 years old, 18.3% who are 9 years old and 5.9% who are 10 years or older.

Chart 2: % Children enrolled in different types of schools, by class



LEARNING

See pages 9-11 for a complete set of ICAN assessment tasks.

Performance on tasks mapped to the minimum proficiency level requirements for SDG 4.1.1 (a)

The minimum proficiency level descriptor for numeracy under SDG 4.1.1 (a) for class 2 or 3 requires students to demonstrate skills in number sense and computation, shape recognition and spatial orientation.

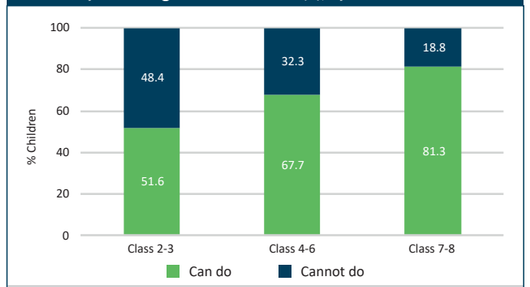
Table 3: % Children in class 2-3 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Spatial orientation	9.2	89.4	47.5	45.2
Shape recognition	7.3	79.5	84.5	71.0
Measurement	7.6	82.5	70.9	60.7

Table 3 shows how children in class 2-3 perform on spatial orientation, shape recognition and measurement tasks. In each of these task categories, children were given two tasks; Task 1 was usually easier than Task 2. The table shows the proportion of children who could not do either task correctly; those who could do the easier task; those who could do the more difficult task; and those who could do both tasks correctly.

Chart 3 shows how foundational numeracy skills progress with class level. It shows the proportion of children in class 2-3, class 4-6 and class 7-8 who can do a set of foundational numeracy tasks that proxy the minimum proficiency level requirements for SDG 4.1.1 (a).

Chart 3: % Children who can do a set of foundational numeracy tasks aligned to SDG 4.1.1 (a), by class



- At least 1 task each on spatial orientation, shape recognition, measurement, and number recognition; as well as
- At least 3 simple number operations.

Performance on number recognition, number operation and word problem tasks

Table 4: % Children who can do number recognition, number operation and word problem tasks, by class

Class	Number recognition		Simple number operations				Advanced number operations				Word problems	
	1-9	10-99	Addition without carry-over	Subtraction without borrow	Single digit multiplication	Single digit division	Addition with carry-over	Subtraction with borrow	Two-digit by one-digit multiplication	Two-digit by one-digit division with remainder	Subtraction	Division
Class 2-3	92.7	82.7	73.2	60.4	68.5	47.9	41.4	27.1	19.4	9.3	18.6	7.9
Class 4-6	93.4	88.6	85.4	75.6	80.7	69.3	62.2	48.1	45.3	22.6	41.1	20.3
Class 7-8	95.7	93.3	89.8	82.4	88.7	78.0	72.3	58.3	59.0	34.0	54.3	29.7

ICAN includes tasks on number recognition at two levels: 1) Identifying numbers from 1-9; and 2) identifying numbers from 10-99. Similarly, it includes tasks on all four number operations (addition, subtraction, multiplication and division) at two levels: 1) Simple number operations without carry-over, borrow and remainder; and 2) Advanced number operations with carry-over, borrow and remainder. Word problems on subtraction and division are also included. Table 4 shows how the performance of children progresses with class level on these number knowledge tasks.

Performance on selected tasks that assess the ability to apply numeracy concepts

Table 5: % Children in class 4-6 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	12.5	84.6	30.8	27.9
Telling time	24.7	68.9	43.6	36.7
Telling day and date	36.7	49.9	51.4	37.8

Table 6: % Children in class 7-8 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	7.4	87.9	46.3	41.4
Telling time	16.0	77.7	64.5	58.2
Telling day and date	19.5	71.1	69.8	60.2

For class 4-6 and class 7-8, children's ability to do tasks requiring application of numeracy concepts is shown in Tables 5 and 6, respectively. This includes two tasks each on reading a simple data display, telling time and telling day and date from a calendar. Task 1 was usually easier than Task 2.

Ségou (Mali)

In Mali, ICAN 2019 was conducted in Ségou circle, in the Ségou Region. The survey reached a total of 60 randomly selected rural communities, 1173 households and assessed 2649 children in the age group of 5 to 16 years. The sample is representative only of this circle.

Children were asked to do a variety of numeracy tasks. All tasks were done one-on-one with children in their homes.

The data is presented in three sections:

- **About the district:** Provides brief details about the surveyed district and summarises selected characteristics of sampled households.
- **Enrolment:** Presents data on children's pre-school and school enrolment and the types of schools children are enrolled in, by age and class.
- **Learning:** Presents data in three sub-sections:
  1) Performance of children in class 2-3 on selected numeracy tasks which can be mapped to the minimum proficiency level requirements for SDG 4.1.1 (a). Children's ability to do these tasks in higher classes is also shown.
  2) Performance of children in class 2-3, class 4-6 and class 7-8 on number recognition, number operation and word problem tasks.
  3) Performance of children in class 4-6 and class 7-8 on selected tasks that assess the ability to apply numeracy concepts.

ABOUT SÉGOU

Mali is divided into 8 regions and one capital district, Bamako, which are further subdivided into 49 circles. Administratively, the Ségou Region has 7 circles, 117 municipalities and more than 2,100 villages and hamlets, representing the smallest administrative division.

Ségou is located in south-central Mali and lies 235 km northeast of Bamako on the bank of the river Niger. According to the 2009 Census, the Ségou circle has a total area of 10,844 km² and a population of 80,461. The major economic activity is described as "Agro-Silvo Pastoralism" (combining pastoralism, or extensive livestock husbandry on pastures, and agriculture in a partially wooded environment). According to the 2016 Beekunko assessment, children achieved an average score of 12% in mathematics, which is the same as the national average. Ségou hosts one of West Africa's most exciting celebrations of tribal traditions and cultures – the annual Ségou Arts Festival, bringing together Malian and international artists.

Household characteristics

Households with:

Walls of permanent material	Toilet	Electricity	Motorised 4-wheeler	Motorised 2-wheeler	Bicycle	Mobile phone	Television	Radio	Computer	Extra reading material
17.3%	98.2%	8.1%	4.4%	82.4%	92.1%	79.8%	46.5%	77.4%	3.9%	7.1%

Parents' education

No schooling | 1 to 5 years of schooling | More than 5 years of schooling

% Mothers by number of years of schooling

% Fathers by number of years of schooling

ENROLMENT

Chart 1: % Children age 5-6 enrolled in different types of pre-schools and schools

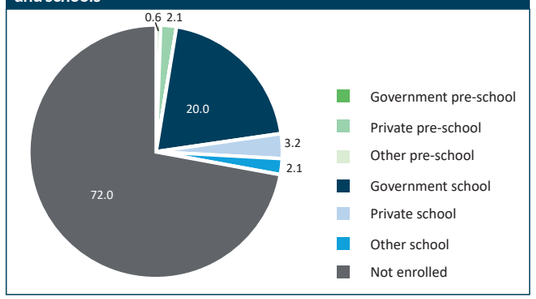


Table 1: % Children enrolled in different types of schools, by age group and sex

Age group	Government	Private	Other	Not in school	Total
Age 6-16: All	45.7	3.6	2.3	48.4	100
Age 6-16: Girls	44.5	3.5	1.7	50.3	100
Age 6-16: Boys	46.7	3.8	2.8	46.7	100
Age 6-10: All	44.5	3.9	2.7	48.9	100
Age 6-10: Girls	43.1	3.8	1.9	51.1	100
Age 6-10: Boys	45.8	3.9	3.4	46.9	100
Age 11-16: All	47.3	3.3	1.8	47.6	100
Age 11-16: Girls	46.7	3.0	1.4	49.0	100
Age 11-16: Boys	47.9	3.6	2.1	46.5	100

'Other' includes children going to religious or community schools.
'Not in school' includes children who never enrolled or have dropped out.

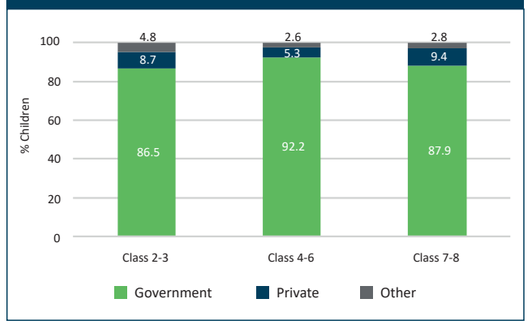
Table 2: Age-class distribution

% Children in each class, by age

Class \ Age	5	6	7	8	9	10	11	12	13	14	15	16	Total
Class 1	13.6	27.5	36.7	14.2	8.0								100
Class 2	1.6	6.2	24.8	31.7	21.1	9.3	5.3						100
Class 3	4.7			18.4	19.1	28.9	10.5	11.9	6.5				100
Class 4	2.2			5.7	14.8	24.4	23.9	16.1	6.1	5.7	1.3		100
Class 5	6.5					12.0	25.5	27.2	13.6	7.6	6.5	1.1	100
Class 6	1.7					6.4	8.1	26.7	25.6	16.9	9.9	4.7	100
Class 7	Insufficient sample size												
Class 8													

This table shows the age distribution for each class. For example, of all children in class 3, 28.9% children are 10 years old but there are also 19.1% who are 9 years old, 10.5% who are 11 years old and 18.4% who are 12 years or older.

Chart 2: % Children enrolled in different types of schools, by class



LEARNING

See pages 9-11 for a complete set of ICAN assessment tasks.

Performance on tasks mapped to the minimum proficiency level requirements for SDG 4.1.1 (a)

The minimum proficiency level descriptor for numeracy under SDG 4.1.1 (a) for class 2 or 3 requires students to demonstrate skills in number sense and computation, shape recognition and spatial orientation.

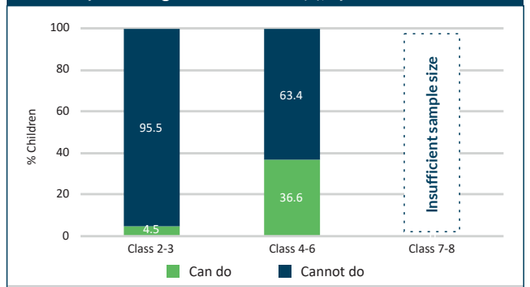
Table 3: % Children in class 2-3 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Spatial orientation	3.3	91.6	82.6	77.5
Shape recognition	18.1	71.1	58.1	47.0
Measurement	2.3	94.5	85.4	82.1

Table 3 shows how children in class 2-3 perform on spatial orientation, shape recognition and measurement tasks. In each of these task categories, children were given two tasks; Task 1 was usually easier than Task 2. The table shows the proportion of children who could not do either task correctly; those who could do the easier task; those who could do the more difficult task; and those who could do both tasks correctly.

Chart 3 shows how foundational numeracy skills progress with class level. It shows the proportion of children in class 2-3, class 4-6 and class 7-8 who can do a set of foundational numeracy tasks that proxy the minimum proficiency level requirements for SDG 4.1.1 (a).

Chart 3: % Children who can do a set of foundational numeracy tasks aligned to SDG 4.1.1 (a), by class



- At least 1 task each on spatial orientation, shape recognition, measurement, and number recognition; as well as
- At least 3 simple number operations.

Performance on number recognition, number operation and word problem tasks

Table 4: % Children who can do number recognition, number operation and word problem tasks, by class

Class	Number recognition		Simple number operations				Advanced number operations				Word problems	
	1-9	10-99	Addition without carry-over	Subtraction without borrow	Single digit multiplication	Single digit division	Addition with carry-over	Subtraction with borrow	Two-digit by one-digit multiplication	Two-digit by one-digit division with remainder	Subtraction	Division
Class 2-3	51.0	14.4	18.1	7.8	11.7	5.6	3.9	1.0	0.2	0.2	0.4	0.2
Class 4-6	86.4	53.0	53.6	42.5	48.3	34.5	25.6	15.5	15.4	6.9	10.0	4.8
Class 7-8	Insufficient sample size											

ICAN includes tasks on number recognition at two levels: 1) Identifying numbers from 1-9; and 2) identifying numbers from 10-99. Similarly, it includes tasks on all four number operations (addition, subtraction, multiplication and division) at two levels: 1) Simple number operations without carry-over, borrow and remainder; and 2) Advanced number operations with carry-over, borrow and remainder. Word problems on subtraction and division are also included. Table 4 shows how the performance of children progresses with class level on these number knowledge tasks.

Performance on selected tasks that assess the ability to apply numeracy concepts

Table 5: % Children in class 4-6 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	10.8	86.5	66.4	63.6
Telling time	84.1	11.2	9.3	4.7
Telling day and date	58.7	29.6	25.7	13.8

Table 6: % Children in class 7-8 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	Insufficient sample size			
Telling time				
Telling day and date				

For class 4-6 and class 7-8, children's ability to do tasks requiring application of numeracy concepts is shown in Tables 5 and 6, respectively. This includes two tasks each on reading a simple data display, telling time and telling day and date from a calendar. Task 1 was usually easier than Task 2.

Tivaouane (Senegal)

In Senegal, ICAN 2019 was conducted in Tivaouane department, in the Thiès Region. The survey reached a total of 59 randomly selected rural communities, 1180 households and assessed 3125 children in the age group of 5 to 16 years. The sample is representative only of this department.

Children were asked to do a variety of numeracy tasks. All tasks were done one-on-one with children in their homes.

The data is presented in three sections:

- **About the district:** Provides brief details about the surveyed district and summarises selected characteristics of sampled households.
- **Enrolment:** Presents data on children's pre-school and school enrolment and the types of schools children are enrolled in, by age and class.
- **Learning:** Presents data in three sub-sections:
  1) Performance of children in class 2-3 on selected numeracy tasks which can be mapped to the minimum proficiency level requirements for SDG 4.1.1 (a). Children's ability to do these tasks in higher classes is also shown.
  2) Performance of children in class 2-3, class 4-6 and class 7-8 on number recognition, number operation and word problem tasks.
  3) Performance of children in class 4-6 and class 7-8 on selected tasks that assess the ability to apply numeracy concepts.

ABOUT TIVAOUANE

Senegal is divided into 14 regions and 45 departments, which are further subdivided into 150 urban and 340 rural communities, as the smallest administrative unit.

The department of Tivaouane is a subdivision of the Thiès Region, which is located in the center-West of Senegal, commonly known as the Groundnut Basin. The department of Tivaouane has a total area of 3,121 km² and a population of 342,519. The main economic activities include farming peanuts, millet, cowpeas and fruit trees, as well as breeding cattle, sheep and goats. According to the 2017 regional report published by the Government of Senegal, the department of Tivaouane has a literacy rate of 70%. The department of Tivaouane is one of the bastions of a religious order in Senegal called Tijanniyya, and the religious festivals in the holy city generate additional economic activities.

Household characteristics

Households with:

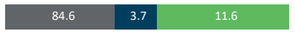
Walls of permanent material	Toilet	Electricity	Motorised 4-wheeler	Motorised 2-wheeler	Bicycle	Mobile phone	Television	Radio	Computer	Extra reading material
77.9%	89.6%	59.2%	16.2%	11.0%	11.6%	94.5%	57.4%	80.2%	7.6%	28.6%

Parents' education

No schooling | 1 to 5 years of schooling | More than 5 years of schooling

% Mothers by number of years of schooling

% Fathers by number of years of schooling



ENROLMENT

Chart 1: % Children age 5-6 enrolled in different types of pre-schools and schools

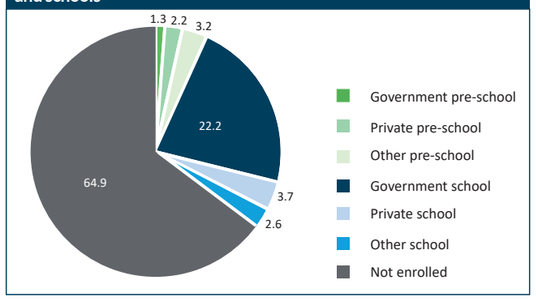


Table 1: % Children enrolled in different types of schools, by age group and sex

Age group	Government	Private	Other	Not in school	Total
Age 6-16: All	59.6	4.5	1.6	34.2	100
Age 6-16: Girls	63.3	4.5	1.9	30.3	100
Age 6-16: Boys	55.5	4.5	1.3	38.6	100
Age 6-10: All	56.7	5.0	1.9	36.3	100
Age 6-10: Girls	61.8	4.1	2.6	31.5	100
Age 6-10: Boys	50.9	6.1	1.2	41.8	100
Age 11-16: All	63.1	3.9	1.3	31.7	100
Age 11-16: Girls	64.9	5.0	1.1	29.0	100
Age 11-16: Boys	61.0	2.6	1.6	34.8	100

'Other' includes children going to religious or community schools.
'Not in school' includes children who never enrolled or have dropped out.

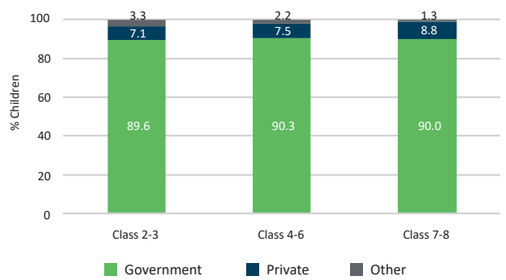
Table 2: Age-class distribution

% Children in each class, by age

Class \ Age	5	6	7	8	9	10	11	12	13	14	15	16	Total
Class 1	10.0	23.6	37.2	14.8	6.3	8.2							100
Class 2	4.9		26.1	24.6	17.8	11.5	15.2						100
Class 3	4.7			13.5	24.9	26.6	11.5	9.8	6.1	3.0			100
Class 4	0.0			6.9	11.4	25.6	17.8	19.6	9.6	5.5	3.7		100
Class 5	6.5					14.8	16.0	29.0	14.2	7.7	8.3	3.6	100
Class 6	1.5					5.9	9.4	26.6	21.7	16.8	14.3	3.9	100
Class 7	Insufficient sample size												
Class 8													

This table shows the age distribution for each class. For example, of all children in class 3, 26.6% children are 10 years old but there are also 24.9% who are 9 years old, 11.5% who are 11 years old and 18.8% who are 12 years or older.

Chart 2: % Children enrolled in different types of schools, by class



Tivaouane (Senegal)

LEARNING

See pages 9-11 for a complete set of ICAN assessment tasks.

Performance on tasks mapped to the minimum proficiency level requirements for SDG 4.1.1 (a)

The minimum proficiency level descriptor for numeracy under SDG 4.1.1 (a) for class 2 or 3 requires students to demonstrate skills in number sense and computation, shape recognition and spatial orientation.

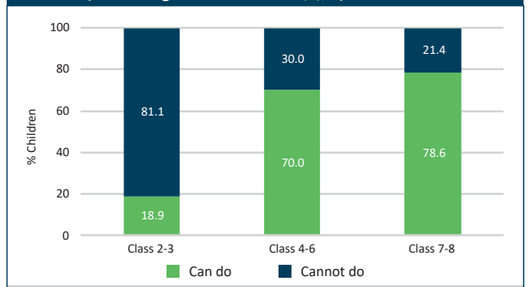
Table 3: % Children in class 2-3 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Spatial orientation	2.2	92.8	92.1	86.9
Shape recognition	6.7	86.0	81.0	73.6
Measurement	1.2	97.4	84.5	83.2

Table 3 shows how children in class 2-3 perform on spatial orientation, shape recognition and measurement tasks. In each of these task categories, children were given two tasks; Task 1 was usually easier than Task 2. The table shows the proportion of children who could not do either task correctly; those who could do the easier task; those who could do the more difficult task; and those who could do both tasks correctly.

Chart 3 shows how foundational numeracy skills progress with class level. It shows the proportion of children in class 2-3, class 4-6 and class 7-8 who can do a set of foundational numeracy tasks that proxy the minimum proficiency level requirements for SDG 4.1.1 (a).

Chart 3: % Children who can do a set of foundational numeracy tasks aligned to SDG 4.1.1 (a), by class



- At least 1 task each on spatial orientation, shape recognition, measurement, and number recognition; as well as
- At least 3 simple number operations.

Performance on number recognition, number operation and word problem tasks

Table 4: % Children who can do number recognition, number operation and word problem tasks, by class

Class	Number recognition		Simple number operations				Advanced number operations				Word problems	
	1-9	10-99	Addition without carry-over	Subtraction without borrow	Single digit multiplication	Single digit division	Addition with carry-over	Subtraction with borrow	Two-digit by one-digit multiplication	Two-digit by one-digit division with remainder	Subtraction	Division
Class 2-3	78.2	36.8	33.2	25.9	29.6	17.1	14.6	8.8	7.1	4.4	4.5	2.5
Class 4-6	94.8	82.6	77.5	68.7	76.1	58.6	55.0	39.5	37.1	23.9	32.0	19.1
Class 7-8	96.4	90.0	87.1	82.1	81.4	74.3	75.0	66.4	69.3	51.4	55.2	42.1

ICAN includes tasks on number recognition at two levels: 1) Identifying numbers from 1-9; and 2) identifying numbers from 10-99. Similarly, it includes tasks on all four number operations (addition, subtraction, multiplication and division) at two levels: 1) Simple number operations without carry-over, borrow and remainder; and 2) Advanced number operations with carry-over, borrow and remainder. Word problems on subtraction and division are also included. Table 4 shows how the performance of children progresses with class level on these number knowledge tasks.

Performance on selected tasks that assess the ability to apply numeracy concepts

Table 5: % Children in class 4-6 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	6.5	89.5	71.3	67.2
Telling time	79.4	16.6	13.2	9.2
Telling day and date	30.2	61.3	48.7	40.1

Table 6: % Children in class 7-8 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	2.9	95.0	85.0	82.9
Telling time	60.0	34.3	30.0	24.3
Telling day and date	11.4	82.0	74.1	66.4

For class 4-6 and class 7-8, children's ability to do tasks requiring application of numeracy concepts is shown in Tables 5 and 6, respectively. This includes two tasks each on reading a simple data display, telling time and telling day and date from a calendar. Task 1 was usually easier than Task 2.

Matagalpa (Nicaragua)

In Nicaragua, ICAN 2019 was conducted in Matagalpa municipality, in the department of Matagalpa. The survey reached a total of 60 randomly selected rural communities, 1191 households and assessed 1172 children in the age group of 5 to 16 years. The sample is representative only of this municipality.

Children were asked to do a variety of numeracy tasks. All tasks were done one-on-one with children in their homes.

The data is presented in three sections:

- **About the district:** Provides brief details about the surveyed district and summarises selected characteristics of sampled households.
- **Enrolment:** Presents data on children's pre-school and school enrolment and the types of schools children are enrolled in, by age and class.
- **Learning:** Presents data in three sub-sections:
  1) Performance of children in class 2-3 on selected numeracy tasks which can be mapped to the minimum proficiency level requirements for SDG 4.1.1 (a). Children's ability to do these tasks in higher classes is also shown.
  2) Performance of children in class 2-3, class 4-6 and class 7-8 on number recognition, number operation and word problem tasks.
  3) Performance of children in class 4-6 and class 7-8 on selected tasks that assess the ability to apply numeracy concepts.

ABOUT MATAGALPA

Nicaragua is divided into 2 regions and 15 departments, which are further subdivided into 153 municipalities.

Matagalpa is a department in central Nicaragua with 13 municipalities. The city of Matagalpa is the capital of the department, and is located in a municipality with the same name. The municipality has a total area of 619 km² and a population of 200,000 (50,000 of whom live rurally). The municipality produces basic grains such as beans, vegetables and coffee, which is processed in the coffee mills located in the south of the municipality. The municipality of Matagalpa was selected for the ICAN assessment in consultation with the Ministry of Education's Director of Teacher Training and the Presidential Advisor on Education as it is considered representative of the primary-level learning outcomes. The city of Matagalpa is the 4th largest in Nicaragua and known as the "Pearl of the North" and "Land of Eternal Spring". A large part of the economy in Matagalpa depends on eco-tourism.

Household characteristics

Households with:

Walls of permanent material	Toilet	Electricity	Motorised 4-wheeler	Motorised 2-wheeler	Bicycle	Mobile phone	Television	Radio	Computer	Extra reading material
91.7%	93.4%	98.0%	7.4%	24.1%	23.1%	81.4%	74.8%	72.7%	7.6%	23.6%

Parents' education

No schooling | 1 to 5 years of schooling | More than 5 years of schooling

% Mothers by number of years of schooling: 17.3 | 38.1 | 44.6

% Fathers by number of years of schooling: 21.8 | 42.2 | 36.0

ENROLMENT

Chart 1: % Children age 5-6 enrolled in different types of pre-schools and schools

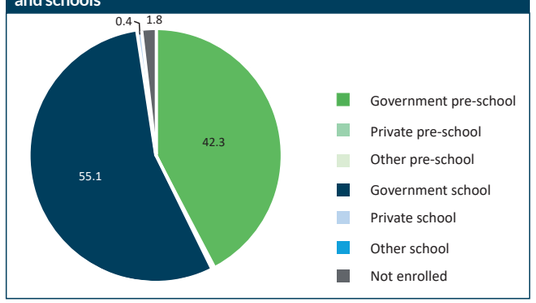


Table 1: % Children enrolled in different types of schools, by age group and sex

Age group	Government	Private	Other	Not in school	Total
Age 6-16: All	94.1	0.4	0.0	5.5	100
Age 6-16: Girls	94.5	0.3	0.0	5.2	100
Age 6-16: Boys	93.6	0.6	0.0	5.8	100
Age 6-10: All	97.1	0.4	0.0	2.5	100
Age 6-10: Girls	97.7	0.3	0.0	2.0	100
Age 6-10: Boys	96.4	0.5	0.0	3.1	100
Age 11-16: All	90.4	0.5	0.0	9.1	100
Age 11-16: Girls	90.5	0.3	0.0	9.2	100
Age 11-16: Boys	90.3	0.6	0.0	9.1	100

'Other' includes children going to religious or community schools.
'Not in school' includes children who never enrolled or have dropped out.

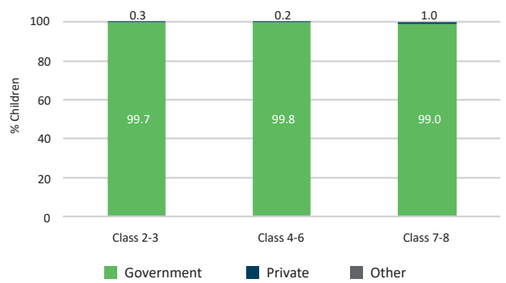
Table 2: Age-class distribution

% Children in each class, by age

Class \ Age	5	6	7	8	9	10	11	12	13	14	15	16	Total
Class 1	7.6	59.6	16.7	7.1	5.1	4.1							100
Class 2	0.5	6.2	56.4	18.0	6.2	12.8							100
Class 3	1.0		7.2	45.9	21.1	11.3	6.2	7.2					100
Class 4	0.6			7.8	45.0	23.9	7.8	3.9	5.0	6.1			100
Class 5	1.6				14.8	41.4	21.9	5.5	10.2	4.7			100
Class 6	0.7					17.4	40.3	15.3	13.2	8.3	4.9		100
Class 7	2.8						8.4	41.1	24.3	10.3	8.4	4.7	100
Class 8	Insufficient sample size												

This table shows the age distribution for each class. For example, of all children in class 3, 45.9% children are 8 years old but there are also 7.2% who are 7 years old, 21.1% who are 9 years old and 24.7% who are 10 years or older.

Chart 2: % Children enrolled in different types of schools, by class



Matagalpa (Nicaragua)

LEARNING

See pages 9-11 for a complete set of ICAN assessment tasks.

Performance on tasks mapped to the minimum proficiency level requirements for SDG 4.1.1 (a)

The minimum proficiency level descriptor for numeracy under SDG 4.1.1 (a) for class 2 or 3 requires students to demonstrate skills in number sense and computation, shape recognition and spatial orientation.

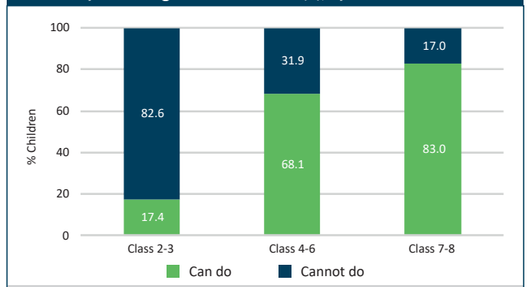
Table 3: % Children in class 2-3 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Spatial orientation	0.6	97.9	91.2	89.3
Shape recognition	2.1	92.4	83.2	77.7
Measurement	0.9	93.6	88.1	82.6

Table 3 shows how children in class 2-3 perform on spatial orientation, shape recognition and measurement tasks. In each of these task categories, children were given two tasks; Task 1 was usually easier than Task 2. The table shows the proportion of children who could not do either task correctly; those who could do the easier task; those who could do the more difficult task; and those who could do both tasks correctly.

Chart 3 shows how foundational numeracy skills progress with class level. It shows the proportion of children in class 2-3, class 4-6 and class 7-8 who can do a set of foundational numeracy tasks that proxy the minimum proficiency level requirements for SDG 4.1.1 (a).

Chart 3: % Children who can do a set of foundational numeracy tasks aligned to SDG 4.1.1 (a), by class



- At least 1 task each on spatial orientation, shape recognition, measurement, and number recognition; as well as
- At least 3 simple number operations.

Performance on number recognition, number operation and word problem tasks

Table 4: % Children who can do number recognition, number operation and word problem tasks, by class

Class	Number recognition		Simple number operations				Advanced number operations				Word problems	
	1-9	10-99	Addition without carry-over	Subtraction without borrow	Single digit multiplication	Single digit division	Addition with carry-over	Subtraction with borrow	Two-digit by one-digit multiplication	Two-digit by one-digit division with remainder	Subtraction	Division
Class 2-3	91.8	63.1	39.6	29.6	28.0	7.6	11.3	6.1	5.2	1.5	4.7	0.6
Class 4-6	98.9	95.5	86.3	71.8	83.9	41.8	56.9	22.2	41.4	15.3	20.5	11.4
Class 7-8	98.0	96.0	89.0	78.0	94.0	73.0	75.8	43.0	70.0	37.0	41.0	33.0

ICAN includes tasks on number recognition at two levels: 1) Identifying numbers from 1-9; and 2) identifying numbers from 10-99. Similarly, it includes tasks on all four number operations (addition, subtraction, multiplication and division) at two levels: 1) Simple number operations without carry-over, borrow and remainder; and 2) Advanced number operations with carry-over, borrow and remainder. Word problems on subtraction and division are also included. Table 4 shows how the performance of children progresses with class level on these number knowledge tasks.

Performance on selected tasks that assess the ability to apply numeracy concepts

Table 5: % Children in class 4-6 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	11.9	85.8	42.3	39.8
Telling time	62.5	29.3	27.2	19.0
Telling day and date	10.8	86.0	58.3	55.2

Table 6: % Children in class 7-8 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	7.0	93.0	54.0	54.0
Telling time	49.0	36.0	45.0	30.0
Telling day and date	3.0	97.0	82.0	82.0

For class 4-6 and class 7-8, children's ability to do tasks requiring application of numeracy concepts is shown in Tables 5 and 6, respectively. This includes two tasks each on reading a simple data display, telling time and telling day and date from a calendar. Task 1 was usually easier than Task 2.

Xalapa Rural (Mexico)

In Mexico, ICAN 2019 was conducted in Xalapa Rural district, in the state of Veracruz. The survey reached a total of 60 randomly selected rural communities, 1199 households and assessed 586 children in the age group of 5 to 16 years. The sample is representative only of this district.

Children were asked to do a variety of numeracy tasks. All tasks were done one-on-one with children in their homes.

The data is presented in three sections:

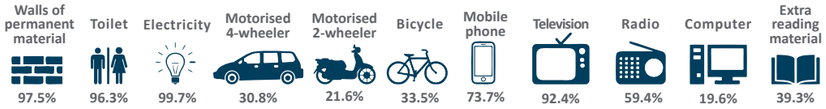
- **About the district:** Provides brief details about the surveyed district and summarises selected characteristics of sampled households.
- **Enrolment:** Presents data on children's pre-school and school enrolment and the types of schools children are enrolled in, by age and class.
- **Learning:** Presents data in three sub-sections:
  1) Performance of children in class 2-3 on selected numeracy tasks which can be mapped to the minimum proficiency level requirements for SDG 4.1.1 (a). Children's ability to do these tasks in higher classes is also shown.
  2) Performance of children in class 2-3, class 4-6 and class 7-8 on number recognition, number operation and word problem tasks.
  3) Performance of children in class 4-6 and class 7-8 on selected tasks that assess the ability to apply numeracy concepts.

ABOUT XALAPA RURAL

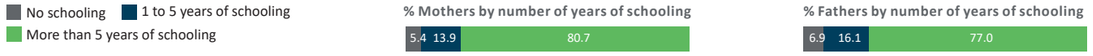
Mexico is divided into 32 states, which are further subdivided into 2,457 municipalities and 304,495 localities. To conduct federal elections, the country is divided into 300 districts, established by dividing the population equally.

District 8: Xalapa Rural, is located in the state of Veracruz. It is a rural district that extends from the mountain areas of the municipalities bordering the capital, Mexico City, to the coastal area of the Gulf of Mexico. According to the 2010 Census, the district has a total area of 4,424 km² and a population of 799,909. The main economic activities of the district are agriculture, fishing and livestock. The average literacy rate for youth aged 15 to 24 is 97%. However, 2017 data from the Institute for the National Planning for the Evaluation of Learning (PLANEA) showed that 38% of rural schools in the region have more than a third of students who are significantly underperforming.

Household characteristics



Parents' education



ENROLMENT

Chart 1: % Children age 5-6 enrolled in different types of pre-schools and schools

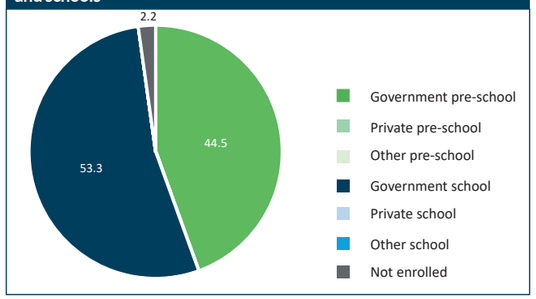


Table 1: % Children enrolled in different types of schools, by age group and sex

Age group	Government	Private	Other	Not in school	Total
Age 6-16: All	95.2	0.0	0.0	4.8	100
Age 6-16: Girls	95.0	0.0	0.0	5.0	100
Age 6-16: Boys	95.5	0.0	0.0	4.5	100
Age 6-10: All	98.9	0.0	0.0	1.1	100
Age 6-10: Girls	98.4	0.0	0.0	1.6	100
Age 6-10: Boys	99.5	0.0	0.0	0.5	100
Age 11-16: All	91.6	0.0	0.0	8.4	100
Age 11-16: Girls	91.8	0.0	0.0	8.2	100
Age 11-16: Boys	91.5	0.0	0.0	8.5	100

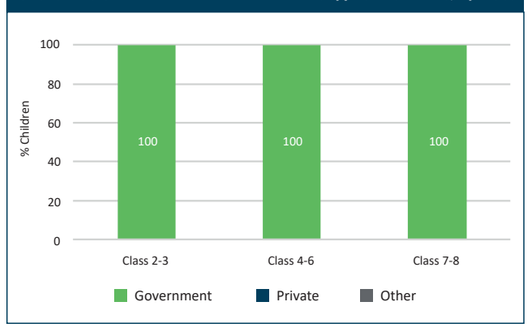
'Other' includes children going to religious or community schools.
'Not in school' includes children who never enrolled or have dropped out.

Table 2: Age-class distribution

% Children in each class, by age

Class \ Age	5	6	7	8	9	10	11	12	13	14	15	16	Total
Class 1	Insufficient sample size												
Class 2													
Class 3													
Class 4													
Class 5													
Class 6													
Class 7													
Class 8													

Chart 2: % Children enrolled in different types of schools, by class



Xalapa Rural (Mexico)

LEARNING

See pages 9-11 for a complete set of ICAN assessment tasks.

Performance on tasks mapped to the minimum proficiency level requirements for SDG 4.1.1 (a)

The minimum proficiency level descriptor for numeracy under SDG 4.1.1 (a) for class 2 or 3 requires students to demonstrate skills in number sense and computation, shape recognition and spatial orientation.

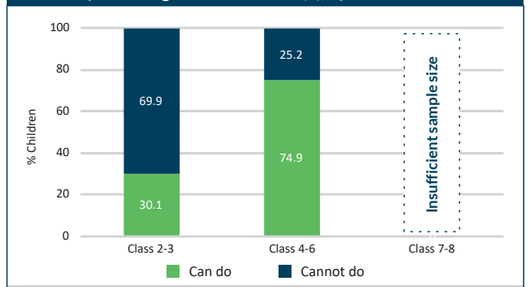
Table 3: % Children in class 2-3 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Spatial orientation	0.0	97.7	97.0	94.7
Shape recognition	5.3	83.5	84.2	72.9
Measurement	3.0	89.5	83.5	75.9

Table 3 shows how children in class 2-3 perform on spatial orientation, shape recognition and measurement tasks. In each of these task categories, children were given two tasks; Task 1 was usually easier than Task 2. The table shows the proportion of children who could not do either task correctly; those who could do the easier task; those who could do the more difficult task; and those who could do both tasks correctly.

Chart 3 shows how foundational numeracy skills progress with class level. It shows the proportion of children in class 2-3, class 4-6 and class 7-8 who can do a set of foundational numeracy tasks that proxy the minimum proficiency level requirements for SDG 4.1.1 (a).

Chart 3: % Children who can do a set of foundational numeracy tasks aligned to SDG 4.1.1 (a), by class



- At least 1 task each on spatial orientation, shape recognition, measurement, and number recognition; as well as
- At least 3 simple number operations.

Performance on number recognition, number operation and word problem tasks

Table 4: % Children who can do number recognition, number operation and word problem tasks, by class

Class	Number recognition		Simple number operations				Advanced number operations				Word problems	
	1-9	10-99	Addition without carry-over	Subtraction without borrow	Single digit multiplication	Single digit division	Addition with carry-over	Subtraction with borrow	Two-digit by one-digit multiplication	Two-digit by one-digit division with remainder	Subtraction	Division
Class 2-3	97.0	81.8	66.2	46.6	48.1	8.3	37.6	11.3	12.8	1.5	11.5	1.5
Class 4-6	98.2	94.7	87.1	75.4	89.5	55.9	69.0	36.8	48.5	32.9	42.4	24.3
Class 7-8	Insufficient sample size											

ICAN includes tasks on number recognition at two levels: 1) Identifying numbers from 1-9; and 2) identifying numbers from 10-99. Similarly, it includes tasks on all four number operations (addition, subtraction, multiplication and division) at two levels: 1) Simple number operations without carry-over, borrow and remainder; and 2) Advanced number operations with carry-over, borrow and remainder. Word problems on subtraction and division are also included. Table 4 shows how the performance of children progresses with class level on these number knowledge tasks.

Performance on selected tasks that assess the ability to apply numeracy concepts

Table 5: % Children in class 4-6 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	7.0	81.9	54.4	43.3
Telling time	40.9	49.1	45.0	35.1
Telling day and date	12.3	84.8	58.5	55.6

Table 6: % Children in class 7-8 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	Insufficient sample size			
Telling time				
Telling day and date				

For class 4-6 and class 7-8, children's ability to do tasks requiring application of numeracy concepts is shown in Tables 5 and 6, respectively. This includes two tasks each on reading a simple data display, telling time and telling day and date from a calendar. Task 1 was usually easier than Task 2.

Betul (India)

In India, ICAN 2019 was conducted in Betul district, in the state of Madhya Pradesh. The survey reached a total of 60 randomly selected rural communities, 1200 households and assessed 1194 children in the age group of 5 to 16 years. The sample is representative only of this district.

Children were asked to do a variety of numeracy tasks. All tasks were done one-on-one with children in their homes.

The data is presented in three sections:

- **About the district:** Provides brief details about the surveyed district and summarises selected characteristics of sampled households.
- **Enrolment:** Presents data on children's pre-school and school enrolment and the types of schools children are enrolled in, by age and class.
- **Learning:** Presents data in three sub-sections:
  1) Performance of children in class 2-3 on selected numeracy tasks which can be mapped to the minimum proficiency level requirements for SDG 4.1.1 (a). Children's ability to do these tasks in higher classes is also shown.
  2) Performance of children in class 2-3, class 4-6 and class 7-8 on number recognition, number operation and word problem tasks.
  3) Performance of children in class 4-6 and class 7-8 on selected tasks that assess the ability to apply numeracy concepts.

ABOUT BETUL

India is composed of 28 states and 8 union territories. These are further subdivided into districts and smaller administrative divisions like tehsils and blocks. In rural areas, the smallest subdivision is a village.

Betul is one of the southern districts in the central state of Madhya Pradesh, lying on the Satpura plateau. According to the Census 2011, Betul district has a population of 1,575,362 and an area of 10,043 km². The district is rich in tribal populations, mainly Gonds and Korkus. Betul district is rich in mountains, forests, and biodiversity. The main timber species of Betul forest is Teak. Asia's biggest wood depot is in Betul. Apart from access to forest resources most of the people are dependent on agriculture and dairy production. According to the National Achievement Survey (NAS) 2017, the average performance of class 3 students in Betul in Mathematics is 64%, very close to the national average of 63%. According to Census 2011, the literacy rate of Betul is 70.14%.

Household characteristics

Households with:

Walls of permanent material	Toilet	Electricity	Motorised 4-wheeler	Motorised 2-wheeler	Bicycle	Mobile phone	Television	Radio	Computer	Extra reading material
54.2%	71.7%	99.1%	4.7%	47.7%	43.9%	80.4%	56.9%	3.9%	2.4%	7.4%

Parents' education

No schooling | 1 to 5 years of schooling | More than 5 years of schooling

% Mothers by number of years of schooling

% Fathers by number of years of schooling

ENROLMENT

Chart 1: % Children age 5-6 enrolled in different types of pre-schools and schools

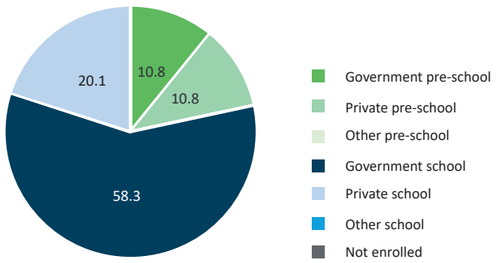


Table 1: % Children enrolled in different types of schools, by age group and sex

Age group	Government	Private	Other	Not in school	Total
Age 6-16: All	76.3	17.6	0.0	6.1	100
Age 6-16: Girls	77.3	15.6	0.0	7.2	100
Age 6-16: Boys	75.2	19.9	0.0	4.9	100
Age 6-10: All	73.3	26.2	0.0	0.5	100
Age 6-10: Girls	75.9	23.2	0.0	0.9	100
Age 6-10: Boys	70.4	29.6	0.0	0.0	100
Age 11-16: All	78.6	11.3	0.0	10.2	100
Age 11-16: Girls	78.2	10.3	0.0	11.4	100
Age 11-16: Boys	79.0	12.4	0.0	8.6	100

'Other' includes children going to religious or community schools.
'Not in school' includes children who never enrolled or have dropped out.

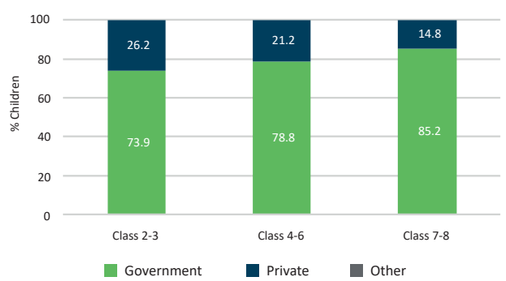
Table 2: Age-class distribution

% Children in each class, by age

Class \ Age	5	6	7	8	9	10	11	12	13	14	15	16	Total
Class 1	22.1	60.0	13.1	4.8									100
Class 2	4.7	16.5	52.8	22.1	3.9								100
Class 3	2.2		17.2	56.0	17.9	6.7							100
Class 4	2.2			21.6	49.3	23.1	3.7						100
Class 5	0.9				16.4	56.0	22.4	4.3					100
Class 6	0.8					13.5	55.6	24.8	5.3				100
Class 7	2.5						20.0	47.5	20.0	7.5	2.5		100
Class 8	5.3							23.2	53.0	14.6	4.0		100

This table shows the age distribution for each class. For example, of all children in class 3, 56% children are 8 years old but there are also 17.2% who are 7 years old, 17.9% who are 9 years old and 6.7% who are 10 years or older.

Chart 2: % Children enrolled in different types of schools, by class



Betul (India)

LEARNING

See pages 9-11 for a complete set of ICAN assessment tasks.

Performance on tasks mapped to the minimum proficiency level requirements for SDG 4.1.1 (a)

The minimum proficiency level descriptor for numeracy under SDG 4.1.1 (a) for class 2 or 3 requires students to demonstrate skills in number sense and computation, shape recognition and spatial orientation.

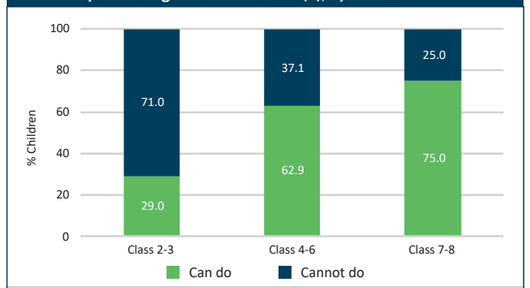
Table 3: % Children in class 2-3 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Spatial orientation	0.5	99.1	92.5	91.6
Shape recognition	6.1	89.1	84.9	79.7
Measurement	0.0	99.5	87.7	87.3

Table 3 shows how children in class 2-3 perform on spatial orientation, shape recognition and measurement tasks. In each of these task categories, children were given two tasks; Task 1 was usually easier than Task 2. The table shows the proportion of children who could not do either task correctly; those who could do the easier task; those who could do the more difficult task; and those who could do both tasks correctly.

Chart 3 shows how foundational numeracy skills progress with class level. It shows the proportion of children in class 2-3, class 4-6 and class 7-8 who can do a set of foundational numeracy tasks that proxy the minimum proficiency level requirements for SDG 4.1.1 (a).

Chart 3: % Children who can do a set of foundational numeracy tasks aligned to SDG 4.1.1 (a), by class



- At least 1 task each on spatial orientation, shape recognition, measurement, and number recognition; as well as
- At least 3 simple number operations.

Performance on number recognition, number operation and word problem tasks

Table 4: % Children who can do number recognition, number operation and word problem tasks, by class

Class	Number recognition		Simple number operations				Advanced number operations				Word problems	
	1-9	10-99	Addition without carry-over	Subtraction without borrow	Single digit multiplication	Single digit division	Addition with carry-over	Subtraction with borrow	Two-digit by one-digit multiplication	Two-digit by one-digit division with remainder	Subtraction	Division
Class 2-3	89.2	52.8	54.7	35.4	39.2	12.8	28.0	13.7	12.0	3.8	10.1	2.4
Class 4-6	97.7	79.1	84.1	68.2	73.1	39.2	66.9	44.8	45.9	26.5	36.9	13.9
Class 7-8	99.5	89.8	90.7	82.4	80.1	51.4	76.7	51.4	60.0	32.6	47.9	23.9

ICAN includes tasks on number recognition at two levels: 1) Identifying numbers from 1-9; and 2) identifying numbers from 10-99. Similarly, it includes tasks on all four number operations (addition, subtraction, multiplication and division) at two levels: 1) Simple number operations without carry-over, borrow and remainder; and 2) Advanced number operations with carry-over, borrow and remainder. Word problems on subtraction and division are also included. Table 4 shows how the performance of children progresses with class level on these number knowledge tasks.

Performance on selected tasks that assess the ability to apply numeracy concepts

Table 5: % Children in class 4-6 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	4.5	93.2	57.8	55.3
Telling time	22.7	71.5	53.1	47.3
Telling day and date	30.7	65.3	49.8	45.6

Table 6: % Children in class 7-8 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	3.7	92.6	73.6	69.4
Telling time	16.7	77.7	64.8	58.8
Telling day and date	20.8	74.5	61.9	56.9

For class 4-6 and class 7-8, children's ability to do tasks requiring application of numeracy concepts is shown in Tables 5 and 6, respectively. This includes two tasks each on reading a simple data display, telling time and telling day and date from a calendar. Task 1 was usually easier than Task 2.

Jhenaidah (Bangladesh)

In Bangladesh, ICAN 2019 was conducted in Jhenaidah district, in the Khulna Division. The survey reached a total of 60 randomly selected rural communities, 1200 households and assessed 893 children in the age group of 5 to 16 years. The sample is representative only of this district.

Children were asked to do a variety of numeracy tasks. All tasks were done one-on-one with children in their homes.

The data is presented in three sections:

- **About the district:** Provides brief details about the surveyed district and summarises selected characteristics of sampled households.
- **Enrolment:** Presents data on children's pre-school and school enrolment and the types of schools children are enrolled in, by age and class.
- **Learning:** Presents data in three sub-sections:
  1) Performance of children in class 2-3 on selected numeracy tasks which can be mapped to the minimum proficiency level requirements for SDG 4.1.1 (a). Children's ability to do these tasks in higher classes is also shown.
  2) Performance of children in class 2-3, class 4-6 and class 7-8 on number recognition, number operation and word problem tasks.
  3) Performance of children in class 4-6 and class 7-8 on selected tasks that assess the ability to apply numeracy concepts.

ABOUT JHENAIDAH

Bangladesh is divided into 8 divisions, which are further subdivided into 64 districts (Zila), and 491 subdivisions (Upazila). Upazilas are divided into union councils (in rural areas), municipalities (in suburbs) and city corporations (in metropolis). The smallest subdivision is a village (in rural areas) or a ward (in urban areas).

Jhenaidah subdivision is located in the southwestern part of Bangladesh, bordering India to the West. Jhenaidah has a total area of 1,949 km² and a population of 1.77 million (approximately 1% of the total population of Bangladesh). Economic activity is predominantly agricultural with 67% land holdings registered as farms. The farms produce a variety of crops including paddy, jute, wheat, sugarcane, mustard seed, onion and garlic, as well as pulses and vegetables. The literacy rate for the subdivision is 62%, compared to the national average of 73%.

Household characteristics

Households with:	Walls of permanent material	Toilet	Electricity	Motorised 4-wheeler	Motorised 2-wheeler	Bicycle	Mobile phone	Television	Radio	Computer	Extra reading material
	87.2%	97.1%	99.2%	2.1%	17.9%	76.6%	96.5%	62.4%	2.0%	2.8%	14.0%

Parents' education

No schooling | 1 to 5 years of schooling | More than 5 years of schooling

% Mothers by number of years of schooling: 18.8 | 30.1 | 51.1

% Fathers by number of years of schooling: 30.7 | 27.1 | 42.2

ENROLMENT

Chart 1: % Children age 5-6 enrolled in different types of pre-schools and schools

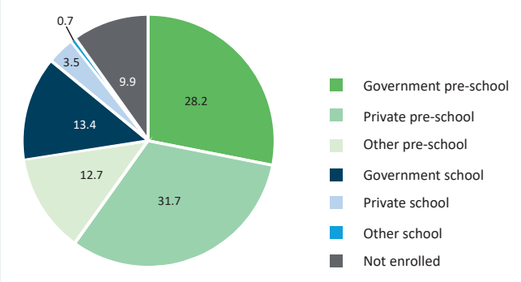


Table 1: % Children enrolled in different types of schools, by age group and sex

Age group	Government	Private	Other	Not in school	Total
Age 6-16: All	53.0	40.7	2.1	4.2	100
Age 6-16: Girls	50.1	45.8	1.8	2.3	100
Age 6-16: Boys	56.4	34.9	2.4	6.4	100
Age 6-10: All	78.2	18.4	1.5	2.0	100
Age 6-10: Girls	74.9	21.6	1.5	2.0	100
Age 6-10: Boys	81.4	15.2	1.5	2.0	100
Age 11-16: All	35.2	56.5	2.5	5.8	100
Age 11-16: Girls	34.5	61.1	1.9	2.5	100
Age 11-16: Boys	36.1	50.8	3.2	9.9	100

'Other' includes children going to religious or community schools.
'Not in school' includes children who never enrolled or have dropped out.

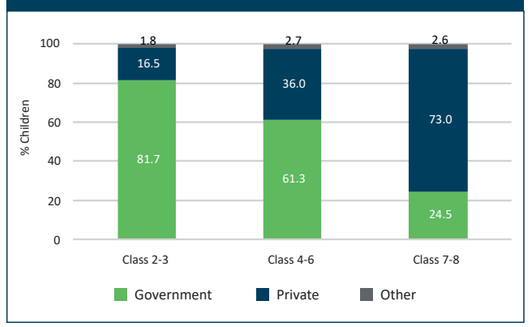
Table 2: Age-class distribution

% Children in each class, by age

Class \ Age	5	6	7	8	9	10	11	12	13	14	15	16	Total
Class 1	0.9	17.0	49.1	23.2	6.3	3.6							100
Class 2	1.7		22.7	39.5	23.5	7.6	5.0						100
Class 3	2.0			22.8	40.6	26.7	5.9	2.0					100
Class 4	5.0				13.9	37.6	24.8	12.9	5.9				100
Class 5	Insufficient sample size												
Class 6													
Class 7													
Class 8	5.9								21.6	39.2	25.5	7.8	100

This table shows the age distribution for each class. For example, of all children in class 3, 40.6% children are 9 years old but there are also 22.8% who are 8 years old, 26.7% who are 10 years old and 7.9% who are 11 years or older.

Chart 2: % Children enrolled in different types of schools, by class



Jhenaidah (Bangladesh)

LEARNING

See pages 9-11 for a complete set of ICAN assessment tasks.

Performance on tasks mapped to the minimum proficiency level requirements for SDG 4.1.1 (a)

The minimum proficiency level descriptor for numeracy under SDG 4.1.1 (a) for class 2 or 3 requires students to demonstrate skills in number sense and computation, shape recognition and spatial orientation.

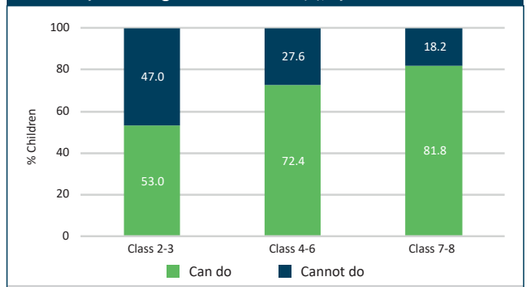
Table 3: % Children in class 2-3 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Spatial orientation	0.6	96.7	92.8	89.5
Shape recognition	3.3	89.0	89.5	81.8
Measurement	0.0	99.4	96.1	95.6

Table 3 shows how children in class 2-3 perform on spatial orientation, shape recognition and measurement tasks. In each of these task categories, children were given two tasks; Task 1 was usually easier than Task 2. The table shows the proportion of children who could not do either task correctly; those who could do the easier task; those who could do the more difficult task; and those who could do both tasks correctly.

Chart 3 shows how foundational numeracy skills progress with class level. It shows the proportion of children in class 2-3, class 4-6 and class 7-8 who can do a set of foundational numeracy tasks that proxy the minimum proficiency level requirements for SDG 4.1.1 (a).

Chart 3: % Children who can do a set of foundational numeracy tasks aligned to SDG 4.1.1 (a), by class



- At least 1 task each on spatial orientation, shape recognition, measurement, and number recognition; as well as
- At least 3 simple number operations.

Performance on number recognition, number operation and word problem tasks

Table 4: % Children who can do number recognition, number operation and word problem tasks, by class

Class	Number recognition		Simple number operations				Advanced number operations				Word problems	
	1-9	10-99	Addition without carry-over	Subtraction without borrow	Single digit multiplication	Single digit division	Addition with carry-over	Subtraction with borrow	Two-digit by one-digit multiplication	Two-digit by one-digit division with remainder	Subtraction	Division
Class 2-3	95.6	73.0	80.6	64.6	64.6	31.5	52.0	23.3	17.1	6.7	23.4	6.3
Class 4-6	97.8	90.6	90.2	73.8	79.6	51.1	68.9	36.6	51.3	23.1	38.5	21.3
Class 7-8	97.9	95.1	87.4	79.0	84.6	59.9	69.2	42.7	54.2	27.3	47.1	28.1

ICAN includes tasks on number recognition at two levels: 1) Identifying numbers from 1-9; and 2) identifying numbers from 10-99. Similarly, it includes tasks on all four number operations (addition, subtraction, multiplication and division) at two levels: 1) Simple number operations without carry-over, borrow and remainder; and 2) Advanced number operations with carry-over, borrow and remainder. Word problems on subtraction and division are also included. Table 4 shows how the performance of children progresses with class level on these number knowledge tasks.

Performance on selected tasks that assess the ability to apply numeracy concepts

Table 5: % Children in class 4-6 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	4.9	90.7	73.3	68.9
Telling time	53.3	38.6	30.8	22.2
Telling day and date	32.9	61.6	39.1	33.3

Table 6: % Children in class 7-8 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	2.8	93.0	83.2	79.0
Telling time	36.4	55.9	47.6	39.9
Telling day and date	13.3	81.8	55.6	50.4

For class 4-6 and class 7-8, children's ability to do tasks requiring application of numeracy concepts is shown in Tables 5 and 6, respectively. This includes two tasks each on reading a simple data display, telling time and telling day and date from a calendar. Task 1 was usually easier than Task 2.

Makwanpur (Nepal)

In Nepal, ICAN 2019 was conducted in Makwanpur district, in Bagmati province. The survey reached a total of 60 randomly selected rural communities, 1200 households and assessed 1023 children in the age group of 5 to 16 years. The sample is representative only of this district.

Children were asked to do a variety of numeracy tasks. All tasks were done one-on-one with children in their homes.

The data is presented in three sections:

- **About the district:** Provides brief details about the surveyed district and summarises selected characteristics of sampled households.
- **Enrolment:** Presents data on children's pre-school and school enrolment and the types of schools children are enrolled in, by age and class.
- **Learning:** Presents data in three sub-sections:
  1) Performance of children in class 2-3 on selected numeracy tasks which can be mapped to the minimum proficiency level requirements for SDG 4.1.1 (a). Children's ability to do these tasks in higher classes is also shown.
  2) Performance of children in class 2-3, class 4-6 and class 7-8 on number recognition, number operation and word problem tasks.
  3) Performance of children in class 4-6 and class 7-8 on selected tasks that assess the ability to apply numeracy concepts.

ABOUT MAKWANPUR

Nepal is divided into 7 provinces and 77 districts, which are further subdivided into 753 rural and urban municipalities. The municipalities are further subdivided into wards, which are the smallest administrative units.

Makwanpur district is located in Bagmati province, which is in the central southern part of Nepal, and is comprised of 10 municipalities. The district is located 76 km from the capital city of Kathmandu. According to the 2011 Census, Makwanpur district has a total area of 2,426 km² and a population of 420,477. The major economic activity is agriculture, with some small family-owned businesses. According to the National Assessment of Student Achievement (NASA) 2012, children in class 3 in Makwanpur scored an average of 63% in various content areas of mathematics compared to the national average of 60%. Makwanpur district is located in a mountainous region, bordered by the Mahabharat and Shivalik mountain ranges.

Household characteristics

Households with:	Walls of permanent material	Toilet	Electricity	Motorised 4-wheeler	Motorised 2-wheeler	Bicycle	Mobile phone	Television	Radio	Computer	Extra reading material
	71.4%	95.0%	85.3%	6.1%	21.3%	11.9%	94.2%	62.8%	26.1%	6.5%	12.3%

Parents' education

No schooling | 1 to 5 years of schooling | More than 5 years of schooling

% Mothers by number of years of schooling: 54.0 | 17.4 | 28.5

% Fathers by number of years of schooling: 28.5 | 31.1 | 40.4

ENROLMENT

Chart 1: % Children age 5-6 enrolled in different types of pre-schools and schools

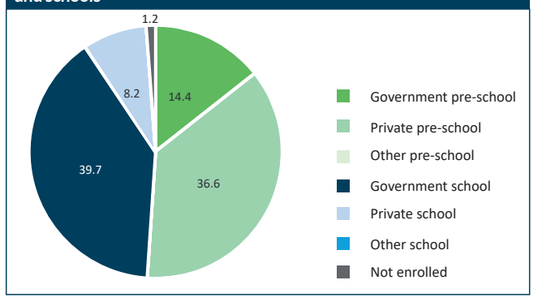


Table 1: % Children enrolled in different types of schools, by age group and sex

Age group	Government	Private	Other	Not in school	Total
Age 6-16: All	77.6	19.0	0.0	3.4	100
Age 6-16: Girls	79.5	18.0	0.0	2.5	100
Age 6-16: Boys	75.2	20.2	0.0	4.6	100
Age 6-10: All	70.3	29.2	0.0	0.5	100
Age 6-10: Girls	74.1	25.9	0.0	0.0	100
Age 6-10: Boys	66.2	32.8	0.0	1.1	100
Age 11-16: All	82.7	11.8	0.0	5.5	100
Age 11-16: Girls	83.2	12.7	0.0	4.1	100
Age 11-16: Boys	82.2	10.5	0.0	7.3	100

'Other' includes children going to religious or community schools.
'Not in school' includes children who never enrolled or have dropped out.

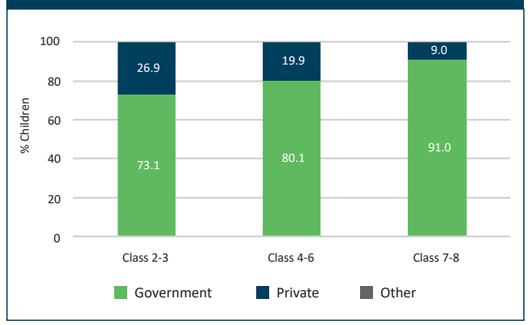
Table 2: Age-class distribution

% Children in each class, by age

Class \ Age	5	6	7	8	9	10	11	12	13	14	15	16	Total
Class 1	18.2	38.2	20.6	13.9	6.1	3.0							100
Class 2	1.4	15.3	25.0	29.2	16.7	6.3	6.3						100
Class 3	2.0		8.5	30.1	31.4	15.7	3.9	6.5	2.0				100
Class 4	1.3			7.7	23.7	36.5	16.0	10.3	4.5				100
Class 5	2.5				7.4	25.2	27.0	22.1	8.6	7.4			100
Class 6	0.7				2.7	8.7	16.0	35.3	18.7	8.0	8.0	2.0	100
Class 7	4.1						10.2	19.7	28.6	21.1	8.8	7.5	100
Class 8	1.5							8.3	17.4	37.9	24.2	10.6	100

This table shows the age distribution for each class. For example, of all children in class 3, 31.4% children are 9 years old but there are also 30.1% who are 8 years old, 15.7% who are 10 years old and 12.5% who are 11 years or older.

Chart 2: % Children enrolled in different types of schools, by class



Makwanpur (Nepal)

LEARNING

See pages 9-11 for a complete set of ICAN assessment tasks.

Performance on tasks mapped to the minimum proficiency level requirements for SDG 4.1.1 (a)

The minimum proficiency level descriptor for numeracy under SDG 4.1.1 (a) for class 2 or 3 requires students to demonstrate skills in number sense and computation, shape recognition and spatial orientation.

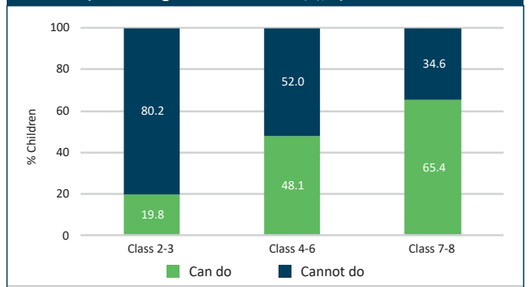
Table 3: % Children in class 2-3 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Spatial orientation	1.6	96.4	85.4	83.3
Shape recognition	5.7	88.0	77.6	71.4
Measurement	1.0	97.9	84.4	83.3

Table 3 shows how children in class 2-3 perform on spatial orientation, shape recognition and measurement tasks. In each of these task categories, children were given two tasks; Task 1 was usually easier than Task 2. The table shows the proportion of children who could not do either task correctly; those who could do the easier task; those who could do the more difficult task; and those who could do both tasks correctly.

Chart 3 shows how foundational numeracy skills progress with class level. It shows the proportion of children in class 2-3, class 4-6 and class 7-8 who can do a set of foundational numeracy tasks that proxy the minimum proficiency level requirements for SDG 4.1.1 (a).

Chart 3: % Children who can do a set of foundational numeracy tasks aligned to SDG 4.1.1 (a), by class



- At least 1 task each on spatial orientation, shape recognition, measurement, and number recognition; as well as
- At least 3 simple number operations.

Performance on number recognition, number operation and word problem tasks

Table 4: % Children who can do number recognition, number operation and word problem tasks, by class

Class	Number recognition		Simple number operations				Advanced number operations				Word problems	
	1-9	10-99	Addition without carry-over	Subtraction without borrow	Single digit multiplication	Single digit division	Addition with carry-over	Subtraction with borrow	Two-digit by one-digit multiplication	Two-digit by one-digit division with remainder	Subtraction	Division
Class 2-3	88.0	48.4	41.9	28.1	38.5	7.3	13.0	4.7	11.1	1.1	4.8	1.1
Class 4-6	96.7	73.8	69.7	56.0	62.9	27.0	35.2	22.1	28.2	6.8	17.5	6.2
Class 7-8	98.3	90.1	81.9	74.2	77.3	42.9	46.2	25.0	32.4	7.7	25.7	7.2

ICAN includes tasks on number recognition at two levels: 1) Identifying numbers from 1-9; and 2) identifying numbers from 10-99. Similarly, it includes tasks on all four number operations (addition, subtraction, multiplication and division) at two levels: 1) Simple number operations without carry-over, borrow and remainder; and 2) Advanced number operations with carry-over, borrow and remainder. Word problems on subtraction and division are also included. Table 4 shows how the performance of children progresses with class level on these number knowledge tasks.

Performance on selected tasks that assess the ability to apply numeracy concepts

Table 5: % Children in class 4-6 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	8.1	85.3	53.6	46.9
Telling time	27.7	65.2	40.4	33.2
Telling day and date	28.7	67.0	37.1	32.6

Table 6: % Children in class 7-8 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	4.4	87.9	76.4	68.1
Telling time	13.2	81.3	63.7	58.2
Telling day and date	9.9	86.8	63.2	59.9

For class 4-6 and class 7-8, children's ability to do tasks requiring application of numeracy concepts is shown in Tables 5 and 6, respectively. This includes two tasks each on reading a simple data display, telling time and telling day and date from a calendar. Task 1 was usually easier than Task 2.

Toba Tek Singh (Pakistan)

In Pakistan, ICAN 2019 was conducted in Toba Tek Singh district, in the province of Punjab. The survey reached a total of 60 randomly selected rural communities, 1198 households and assessed 1616 children in the age group of 5 to 16 years. The sample is representative only of this district.

Children were asked to do a variety of numeracy tasks. All tasks were done one-on-one with children in their homes.

The data is presented in three sections:

- **About the district:** Provides brief details about the surveyed district and summarises selected characteristics of sampled households.
- **Enrolment:** Presents data on children's pre-school and school enrolment and the types of schools children are enrolled in, by age and class.
- **Learning:** Presents data in three sub-sections:
  1) Performance of children in class 2-3 on selected numeracy tasks which can be mapped to the minimum proficiency level requirements for SDG 4.1.1 (a). Children's ability to do these tasks in higher classes is also shown.
  2) Performance of children in class 2-3, class 4-6 and class 7-8 on number recognition, number operation and word problem tasks.
  3) Performance of children in class 4-6 and class 7-8 on selected tasks that assess the ability to apply numeracy concepts.

ABOUT TOBA TEK SINGH

Pakistan consists of 4 provinces, 2 autonomous territories and 1 federal territory. The provinces and territories are further subdivided into 154 districts and sub districts, known as tehsils/taluka. The smallest administrative units are villages (in rural areas) and blocks (in urban areas).

Toba Tek Singh District is located in the province of Punjab, with a total area of 3,259 km² and a population of over 2.1 million. The major economic activities include agriculture and the textile industry. The region produces dairy, cotton, maize, fruits and vegetables. According to 2018 Annual Status of Education Report (ASER) Pakistan, 42% of children in classes 1 to 5 can do subtraction sums, which is close to the national average of 41%. The district was named after Tek Singh who was a kind Sikh religious figure who provided shelter and water to travelers passing by a small pond ("toba" in Punjabi). The district is famous for its production of handloom fabric known as "Khaddar".

Household characteristics

Households with:

Walls of permanent material	Toilet	Electricity	Motorised 4-wheeler	Motorised 2-wheeler	Bicycle	Mobile phone	Television	Radio	Computer	Extra reading material
88.1%	91.7%	99.2%	9.1%	65.5%	40.1%	86.1%	70.5%	7.3%	18.3%	24.4%

Parents' education

No schooling | 1 to 5 years of schooling | More than 5 years of schooling

% Mothers by number of years of schooling

% Fathers by number of years of schooling

ENROLMENT

Chart 1: % Children age 5-6 enrolled in different types of pre-schools and schools

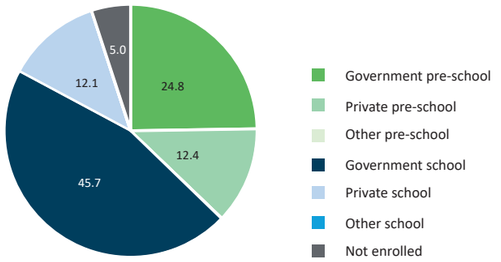


Table 1: % Children enrolled in different types of schools, by age group and sex

Age group	Government	Private	Other	Not in school	Total
Age 6-16: All	80.7	16.0	0.2	3.0	100
Age 6-16: Girls	80.6	15.6	0.4	3.4	100
Age 6-16: Boys	80.9	16.4	0.1	2.6	100
Age 6-10: All	78.6	19.4	0.1	1.9	100
Age 6-10: Girls	77.9	19.7	0.2	2.2	100
Age 6-10: Boys	79.3	19.1	0.0	1.7	100
Age 11-16: All	82.8	12.8	0.4	4.0	100
Age 11-16: Girls	83.3	11.3	0.6	4.7	100
Age 11-16: Boys	82.4	14.0	0.2	3.5	100

'Other' includes children going to religious or community schools.
'Not in school' includes children who never enrolled or have dropped out.

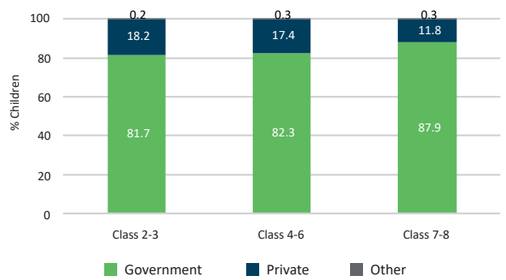
Table 2: Age-class distribution

% Children in each class, by age

Class \ Age	5	6	7	8	9	10	11	12	13	14	15	16	Total
Class 1	30.6	30.3	19.2	11.7	8.2								100
Class 2	1.8	13.1	41.6	23.7	10.2	5.1	4.4						100
Class 3	1.7		8.8	37.1	30.6	12.9	8.8						100
Class 4	5.2			7.6	30.0	37.6	9.6	7.6	2.4				100
Class 5	3.8				9.8	29.3	20.2	19.5	8.4	5.9	3.1		100
Class 6	2.2					9.6	18.0	41.6	15.7	7.3	5.1	0.6	100
Class 7	3.3						5.0	33.5	30.8	16.5	6.0	5.0	100
Class 8	1.1							7.6	23.4	44.6	18.5	4.9	100

This table shows the age distribution for each class. For example, of all children in class 3, 37.1% children are 8 years old but there are also 8.8% who are 7 years old, 30.6% who are 9 years old and 21.7% who are 10 years or older.

Chart 2: % Children enrolled in different types of schools, by class



Toba Tek Singh (Pakistan)

LEARNING

See pages 9-11 for a complete set of ICAN assessment tasks.

Performance on tasks mapped to the minimum proficiency level requirements for SDG 4.1.1 (a)

The minimum proficiency level descriptor for numeracy under SDG 4.1.1 (a) for class 2 or 3 requires students to demonstrate skills in number sense and computation, shape recognition and spatial orientation.

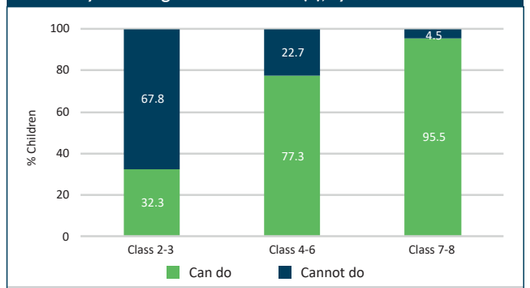
Table 3: % Children in class 2-3 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Spatial orientation	2.2	97.0	97.3	95.9
Shape recognition	13.5	80.4	74.3	67.4
Measurement	3.0	94.9	83.4	81.0

Table 3 shows how children in class 2-3 perform on spatial orientation, shape recognition and measurement tasks. In each of these task categories, children were given two tasks; Task 1 was usually easier than Task 2. The table shows the proportion of children who could not do either task correctly; those who could do the easier task; those who could do the more difficult task; and those who could do both tasks correctly.

Chart 3 shows how foundational numeracy skills progress with class level. It shows the proportion of children in class 2-3, class 4-6 and class 7-8 who can do a set of foundational numeracy tasks that proxy the minimum proficiency level requirements for SDG 4.1.1 (a).

Chart 3: % Children who can do a set of foundational numeracy tasks aligned to SDG 4.1.1 (a), by class



- At least 1 task each on spatial orientation, shape recognition, measurement, and number recognition; as well as
- At least 3 simple number operations.

Performance on number recognition, number operation and word problem tasks

Table 4: % Children who can do number recognition, number operation and word problem tasks, by class

Class	Number recognition		Simple number operations				Advanced number operations				Word problems	
	1-9	10-99	Addition without carry-over	Subtraction without borrow	Single digit multiplication	Single digit division	Addition with carry-over	Subtraction with borrow	Two-digit by one-digit multiplication	Two-digit by one-digit division with remainder	Subtraction	Division
Class 2-3	71.3	55.3	54.4	39.8	47.5	30.7	43.1	31.9	32.3	24.2	27.7	24.1
Class 4-6	93.2	89.8	88.9	80.1	86.4	76.3	83.4	74.5	76.8	67.8	74.4	68.3
Class 7-8	98.5	97.3	98.1	97.0	98.1	94.3	97.0	95.8	95.4	92.0	95.0	92.7

ICAN includes tasks on number recognition at two levels: 1) Identifying numbers from 1-9; and 2) identifying numbers from 10-99. Similarly, it includes tasks on all four number operations (addition, subtraction, multiplication and division) at two levels: 1) Simple number operations without carry-over, borrow and remainder; and 2) Advanced number operations with carry-over, borrow and remainder. Word problems on subtraction and division are also included. Table 4 shows how the performance of children progresses with class level on these number knowledge tasks.

Performance on selected tasks that assess the ability to apply numeracy concepts

Table 5: % Children in class 4-6 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	1.6	97.1	95.7	94.2
Telling time	8.0	90.3	89.7	87.8
Telling day and date	7.2	90.1	89.9	86.6

Table 6: % Children in class 7-8 who can do selected numeracy tasks

Task category	Cannot do either task	Can do Task 1	Can do Task 2	Can do both tasks
Simple data display	0.8	98.9	98.9	98.1
Telling time	1.9	97.4	96.6	95.9
Telling day and date	1.1	97.7	98.5	97.4

For class 4-6 and class 7-8, children's ability to do tasks requiring application of numeracy concepts is shown in Tables 5 and 6, respectively. This includes two tasks each on reading a simple data display, telling time and telling day and date from a calendar. Task 1 was usually easier than Task 2.

8.
Epilogue [1]

The meeting convened by UNESCO Institute for Statistics (UIS) for 'consensus building on proficiency levels with performance descriptors' in UNESCO Paris in September 2018 inviting all leading global stakeholders in assessments became a game changer for the PAL Network, where two of its core members were invited (UIS Concept Note-Sept. 2018). The meeting's objective was to build consensus on minimum proficiency level descriptors to report on three education levels: in Grade 2 or 3 (4.1.1a), at the end of primary education (4.1.1b), and at the end of lower secondary education (4.1.1c), in two subject areas (reading and mathematics) as specified in indicator 4.1.1. This consensus framing helped the PAL Network to analyse its citizen-led tools from each country context. After 18 months of hard core reviews, addition of new items, pilots and adjustments the PAL Network is proudly presenting ICAN (International Common Assessment of Numeracy) to the world.

Developed and implemented by the PAL Network member organisations, ICAN is a cross national, comparative assessment tool, covering diverse regions of the Global South. It is an assessment of foundational numeracy using common items, providing data on early grades/lower primary and further highlighting gaps in foundational numeracy even for older children. PAL Network member organisations prepared the tool for ICAN spread across 11 languages, agreeing to retain the core consistent principles that distinguish the network.

ICAN is being scaled further and leveraged as an innovation, supported by the Global Partnership for Education (GPE). ICAN can provide valid and reliable estimates of the status of children's schooling and foundational abilities for comparison and monitoring trends across the PAL Network countries aligned with the requirements of SDG 4.1.

COVID-19 and implications for ICAN and SDG 4.1.1

The global disruption to education and learning due to the apocalyptic COVID-19 has been an unimaginable scenario for all the architects of SDGs/SDG 4 globally. These shifts are here to stay; new social assets have been created in the 'new normal'; and adjustments will continue.

Rukmini Banerji, CEO of Pratham Education Foundation and founder of CLAs, rightly asserts, **'In this context ICAN provides an ideal opportunity to re-visit the learning crisis and re-engage in new and stronger ways to ensure every child is in school and learning well. Through ICAN, we can look forward to families and communities, teachers and schools working together for rebuilding our children's futures'.**

Baela Raza Jamil

Annual Status of Education Report (ASER), Pakistan and Chairperson, PAL Network Advisory Group

[1]Extracted from "Introducing ICAN (International Common Assessment of Numeracy) as a Global Learning Metric", blog post on the PAL Network website (https://palnetwork.org/introducing-ican-international-common-assessment-of-numeracy-as-a-global-learning-metric/)

Appendix

Appendix 1: Summary of ICAN 2019 field pilots

Pilot round	Pilot 1	Pilot 2*	Pilot 3	Pilot 4
Date	Dec 2018-Jan 2019	June-July 2019	Aug-2019	Sep-2019
Objective	To pilot tasks from different domains, with a range of difficulty levels, in preparation for a multi-country school pilot in the next stage	▪ To pilot and understand difficulty level of tasks across different geographies ▪ To understand cultural issues with any tasks	▪ To pilot tasks for an alternate test form, in preparation for a multi-country community pilot in the next stage	▪ To administer the assessment tasks in households in the target age group of 5 to 16 years ▪ To pilot the contextual questionnaires ▪ To trial quality control procedures ▪ To identify field enumerators and local district partners for the forthcoming large-scale implementation
Countries covered	2 (India, Kenya)	12 (Bangladesh, India, Kenya, Mali, Mexico, Mozambique, Nepal, Nicaragua, Nigeria, Pakistan, Tanzania, Uganda)	1 (India)	13 (Bangladesh, India, Kenya, Mali, Mexico, Mozambique, Nepal, Nicaragua, Nigeria, Pakistan, Senegal, Tanzania, Uganda)
Modules piloted	Assessment tasks	Assessment tasks	Assessment tasks	▪ Assessment tasks ▪ Contextual questionnaires ▪ Quality control processes including field enumerator training and field monitoring and recheck ▪ Data entry system
Assessment administration	Oral, one-on-one for number recognition, geometry, measurement and data display tasks Group-based, pen and paper for number operation tasks	Oral, one-on-one for number recognition, geometry, measurement and data display tasks Group-based, pen and paper for number operation tasks	Oral for all tasks	Oral for all tasks

Pilot round		Pilot 1	Pilot 2*	Pilot 3	Pilot 4
Number of enumerators		15	150	20	130
Sample selection		Convenience sample of schools in rural areas in each participating country Children randomly sampled from classes	Convenience sample of schools in rural areas in each participating country Children randomly sampled from classes	Convenience sample of schools in rural areas in each participating country Children randomly sampled from classes	Random sample of 5 rural communities from the district selected for large-scale implementation All children living regularly in the sampled households were assessed
Age/class of children included in sample		Children from classes 2 to 7	Children from classes 1 to 9	Children from classes 1 to 8	Children from age 5 to 16
Sample size	Number of schools / communities	5 schools	26 schools	3 schools	65 rural communities
	Number of children surveyed (approx.)	300	2100	300	2100
Languages used		English, Hindi	Bangla, English, Hindi, Kiswahili, Nepali, Spanish, Urdu	Hindi	Bangla, English, French, Hindi, Kiswahili, Nepali, Portuguese, Spanish, Urdu

*After completing Pilot 2, PMTs from all 13 participating PAL Network member organisations met for a 5-day consensus building meeting in Limuru, Kenya in July 2019. During this meeting assessments tasks were shortlisted based on experiences from Pilot 2, and questions for the contextual questionnaires were drafted. In addition, the quality control framework was developed and consensus was built on timelines for the large-scale implementation.

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