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Impact evaluation of an inclusive early childhood development and education intervention in Kenya: Endline report

May 2024

Supported by:

Sightsavers

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Suggested reference

Muuo SW, Jeyam A, de Kadt J, Schmidt E. Impact evaluation of an inclusive early childhood development and education intervention in Kenya: Endline report. Nairobi, Sightsavers 2024.

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Acknowledgements

We would like to thank the Ministry of Education in Kenya and the county governments of Homa Bay and Turkana for their support in conducting this study. We are very grateful to all children in the study schools who participated in the research and whose data was analysed to provide content for this report. We thank their families for allowing the children to participate, and the school administration and teachers who provided their time and very valuable insights which made this study possible.

We acknowledge efforts from the consortium of partners that were directly involved in the execution of this work including Sightsavers, Humanity & Inclusion, Sense International and the Institute of Development Studies (IDS).

We would like to thank all the assessors who took part in the education and data collection activities in both Homa Bay and Turkana counties. In Homa Bay, we are particularly grateful to Rena Prisca Adhiambo, John William Jairo, MaryHilda Osindo, Allanjames Oballa, John Onyango, Damaris Obiero, Eldrine Amollo, Evarlyne Okiro, Caroline Obilo, Mildred Agango, Dickens Ochieng' and Winnie Achieng' Okwach. In Kakuma, we thank Isra Yahya, James Emase, Peter Magu, Santolina Muhaweimana, Edith Okech, Kamoso Jean, Ikram Arbab, Manas Wal Nyaluak, Erchin Ali, Agot Kuol, Hamdi Yusuf, Nasron Titus, Abdifatah Bishar Aden, Hamad Abubakar, Kifah Mohammed, Ahadi Matabaro, Lewis Erukon Ekulan, Nyariel Udiel Bol and Emmanuel Adam. Agrippina Apondi Achieng and Brian Alex Okello contributed to data collection in both areas, while also supporting training and providing team leadership in Kakuma.

In addition, we are grateful to individuals within the programme teams who provided administrative and logistics support, without which the field activities would have been very difficult. In Homa Bay, we thank the Sightsavers team including Charles Odol, Festus Kang'alya, Erick Otieno, Tom Tilla and Henry Sande. In Nairobi, we thank Timothy Nyongesa, Micah Odede, Flora Mureithi, Rabecca Matolo, Dorothy Okello and Anne Adede. In Kakuma, we thank the Humanity & Inclusion team including Simon Mwangi, Brian Kipng'enoh, Simon Wanyoike, Bernard Kariuki and Kelvin Obulemire. Finally, we recognise the guidance and support from Veronica Stapleton, Lucy Reeve, Benedict Mutethya, Neema Kalole, Gillian Mackay, Amos Kibet and other study steering committee members.

The team would like to thank UK Aid which funded this research under the Disability Inclusive Development (DID) programme.

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List of acronyms

CBC	Competency-based Curriculum
CFM	UNICEF-Washington Group Child Functioning Module
CI	Confidence interval
DID	Disability Inclusive Development
ECD	Early Childhood Development
ECDE	Early Childhood Development and Education
IDELA	International Development and Early Learning Assessment
iNGOs	International Non-governmental Organisations
IQR	Interquartile range
LSA	Learner Support Assistant
NACOSTI	National Commission for Science, Technology and Innovation
OPDs	Organisations for Persons with Disabilities
PP1	Pre-primary 1 (First year of pre-primary, usually ages 3-4 years)
PP2	Pre-primary 2 (Second year of pre-primary, usually ages 4-5 years)
SBIT	School-based Inclusion Team

Executive summary

Background

The early years period (from birth to eight years of age) is a critical phase in a child's lifetime for their growth and development. Getting the foundations right during these years carries significant future benefits, including better learning in school and higher educational attainment – both of which result in major social and economic gains for individuals and society. Despite important progress being made in the support of young children over recent decades, millions are still not receiving adequate stimulation and care, and remain at risk of suboptimal development. These risks are particularly pronounced for 240 million children with disabilities, who face additional barriers that undermine their development and growth.

The study presented here was an integral part of the Disability Inclusive Development (DID) Early Childhood Development and Education (ECDE) project delivered by the Kenyan government in collaboration with a consortium of international non-governmental organisations (iNGOs) and organisations of persons with disabilities (OPDs) in selected schools in two counties in Kenya. In the Kenya education system, pre-primary education is free, compulsory and organised over two years: pre-primary 1 (PP1) and pre-primary 2 (PP2). The project developed and delivered a range of contextually appropriate inclusive ECDE approaches to improve learning, educational and developmental outcomes for all children participating in pre-primary schooling, including children with disabilities. These approaches included:

- Provision of continuous professional guidance and development to teachers.
- Capacity building of school leadership and the establishment and training of nine school-based inclusion teams (SBITs).
- Training of parents and caregivers on positive parenting strategies.
- Improvement of physical accessibility of school environments in one project school.
- Training of learner support assistants (LSAs).
- Opening of a play and learning centre in one project school.
- Advocacy activities and training to representatives of OPDs and education officials.

The project was implemented in two distinct locations: in rural and peri-urban areas of Homa Bay county in western Kenya (Homa Bay study site) and the area hosting the Kakuma refugee camp and the Kalobeyei integrated settlement in Turkana county, north-western Kenya (Kakuma study site). In total, nine mainstream public pre-primary schools – six in Homa Bay and three in Kakuma – were involved in the implementation of disability-inclusive interventions through the project. The project worked in support of children across both pre-primary grades.

The study aimed to generate new evidence on the early development and education of children with disabilities at mainstream ECDE schools in Kenya. It also aimed to assess the impact of disability-inclusive education practices supported by the project on the developmental and learning outcomes of children – with and without disabilities – enrolled in the project schools.

The study generated several pieces of evidence which had been previously lacking or limited in the inclusive ECDE discourse, namely:

- Prevalence and type of functional difficulty among young children attending pre-school services.
- Similarities and differences in developmental and early learning outcomes of children with and without disabilities.
- How inclusive education practices impact on the development and early learning of children with and without disabilities.

This report presents results of the impact evaluation. Baseline results were presented in a separate report and can be found **here**.

Study design and methods

This was a school-based, cluster non-randomised controlled trial. Interventions were implemented in six schools in Homa Bay and three schools in Kakuma. Control schools (six in Homa Bay and three in Kakuma) were selected to match intervention schools based on size and were in locations that minimised the risk of potential contamination.

At baseline, all children who started PP1 at each of the 18 (nine intervention and nine control) schools in two academic years, 2021 and 2022, were eligible for enrolment. Only children who were enrolled at baseline were eligible to participate in endline assessments conducted at the end of PP2, 12-18 months after the baseline.

The disability status of children was assessed using the UNICEF/Washington Group Child Functioning Module (CFM), which was administered to the children's primary caregivers. This tool measures difficulty in performing basic body functions across several domains, such as seeing, hearing, walking, playing, behaviour and communication. Child development and early learning (the primary outcome of the trial) was assessed using the International Development and Early Learning Assessment (IDELA) tool, developed by Save the Children and applied in more than 100 countries worldwide. The IDELA tool assesses young children's skills across four domains: motor development, socio-emotional development, emergent literacy and emergent numeracy. Children are scored between zero and 100 for each domain, and overall. We also collected socio-demographic data from caregivers and data on household relative wealth, using the Kenya Equity Tool.

Data was collected electronically on tablets by trained assessors and analysed using R version 4.2.1. Data was analysed separately for each of the study areas due to the widely different contexts of these settings, and variations in intervention implementation.

IDELA scores at baseline and endline were described using median and interquartile range (IQR) by study arm, and further disaggregated by functional difficulty status and sex. A difference-in-difference approach was used to evaluate the impact of the intervention on IDELA scores. The modelled outcome was the within-person change in IDELA score: for each child we calculated the difference between their IDELA scores at endline and baseline, for the overall score and for each of the four domain scores. In the univariate model for the association between study arm and change in IDELA scores, we controlled only for age. In the multivariable models, adjustments were made for age, sex, relative wealth, whether or not children were living with both parents, functional difficulty status, study cohort (as a proxy for study duration) and rural/peri-urban location (within Homa Bay only).

The trial also assessed the effect of the intervention on school attendance and educational performance. Data on school attendance was extracted from school registers. Educational performance data was extracted from individual competency-based curriculum (CBC) records of routine assessments by class teachers.

Ethical approval was obtained from the Strathmore University Science and Ethics Committee in Kenya (reference number SU-IERC1019/21). A research licence to conduct the study was also obtained from the National Commission for Science, Technology and Innovation (NACOSTI) with the licence number NACOSTI/P/23/24281). Authorisation to carry out research activities within schools was obtained from the Ministry of Education, county and sub-county departments of education, and school management. Prior to data collection, written informed consent was obtained from parents/caregivers. Participating children additionally provided verbal assent before each IDELA assessment.

Key findings

Participant characteristics and attrition

A total of 1,748 children were enrolled in the study: 1,074 (61%) in Homa Bay and 674 (39%) in Kakuma. Baseline IDELA scores were collected from 1,615 children: 1,030 in Homa Bay and 585 in Kakuma. The study had a high level of attrition between baseline and endline. In Homa Bay intervention schools, 171 children – including 37 with functional difficulties – could not be assessed at endline. According to school records, the majority of these children (over 83%) had left the school altogether. Patterns of attrition in control schools were similar. In Kakuma intervention schools, 95 children – including 14 children with functional difficulties – could not be found at endline. Here, about a third of these children had left the school altogether, another third was still enrolled but absent during the endline data collection period, and around 18% could not be identified as the teacher could not recognise their names. Patterns of attrition in control schools in Kakuma were similar.

The total number of children included in the impact evaluation analysis was 1,120 (64.1% of those originally enrolled, and 69.3% of those with the baseline IDELA data). This comprised 747 children in Homa Bay (352 intervention and 395 control) and 373 children in Kakuma (199 intervention and 174 control).

In the baseline sample, participant characteristics were generally similar across intervention and control arms, but there were some minor differences. In Homa Bay, the intervention arm included significantly more girls, more children in cohort one, and more children who lived with both their parents, relative to the control arm. In Kakuma, only the distribution of relative wealth differed, with a lower proportion of children from the two poorest quintiles in the intervention arm compared to the control arm. It is worth noting, however, that the overwhelming majority of children in this area (in both intervention and control schools) were from the two poorest quintiles, and consequently the sample was much poorer than the average population of Kenya. Participant characteristics among those retained for impact evaluation analyses were broadly similar to those for the full baseline sample, with the same differences between intervention and control arms.

Among children retained for the impact evaluation, 48.5% (n=362) in Homa Bay and 49.6% (n=185) in Kakuma were girls. Based on the recommended cut-off points for the analysis of CFM, the prevalence of functional difficulty in children in Homa Bay was around 20% (19.8% in intervention schools and 19.5% in control schools). In Kakuma, the prevalence was lower (10.6% in intervention schools and 6.9% in control schools).

IDELA scores and impact evaluation

The median total baseline IDELA score in intervention schools in Homa Bay was 48 (49 for girls and 47 for boys). In Kakuma, the overall median score at baseline was 14 points lower at 34 for all children (32 for girls and 35 for boys). Among children attending intervention schools, we found no significant difference in the baseline IDELA scores of children with and without functional difficulties: 49 and 48 respectively in Homa Bay, and 35 and 33 respectively in Kakuma. The median IDELA scores of children in the control schools were similar to those in intervention schools in Homa Bay (48) and slightly lower in Kakuma (26).

At endline, towards the end of PP2 (12-18 months later) median developmental scores had increased for all groups of children. In Homa Bay intervention schools, the sample's median overall score increased from 48 to 68 (from 49 to 68 for girls and from 47 to 68 for boys). The median change in children's individual scores was 19 (20 for girls and 18 for boys). In Kakuma intervention schools, the sample's median score increased from 34 to 57 (from 32 to 56 for girls and from 35 to 57 for boys). The median change in children's individual scores was 22 (23 for girls and 21 for boys).

The scores of children in the control schools increased in a similar way. The sample median score in Homa Bay increased from 48 to 70 (from 49 to 71 for girls and from 47 to 71 for boys). The sample median score in Kakuma increased from 26 to 48 (from 23 to 46 for girls and from 27 to 53 for boys). The median change in children's individual scores was 20 (20 for girls and 21 for boys) in the control schools in Homa Bay and 22 (23 for girls and 21 for

boys) in the control schools in Kakuma. The results of the univariate and multivariable analysis showed no statistically significant associations between change in IDELA scores and study arm.

In specific IDELA domains, sample median scores and median change in children's individual score followed a broadly similar pattern. In Homa Bay, the median change was 17 points in motor development in intervention schools (19 in control), 16 points in socio-emotional development (13 in control), 21 points in emergent literacy (24 in control) and 23 points in emergent numeracy (22 in control). In Kakuma, individual changes in specific IDELA domains were similar in the intervention and control groups in motor development (29 and 31 points respectively) and socio-emotional development (21 points in both groups), but slightly higher in the intervention group in emergent literacy (22 versus 17 points) and emergent numeracy (21 versus 16). These differences were not statistically significant.

Children with and without functional difficulties in both intervention and control schools increased their developmental score with a similar trajectory. In Homa Bay, the median increase in children's individual overall IDELA score (for children with functional difficulties) was 20 points in intervention schools (19 in control). Scores in specific domains also increased by 19 points in motor development in intervention schools (16 in control), 15 points in socio-emotional development (15 in control), 22 points in emergent literacy (25 in control) and 23 points in emergent numeracy (23 in control).

In Kakuma, the median increase in children's overall IDELA score (for children with functional difficulties) was 18 points in both intervention and control schools. Scores in specific domains also increased, but the pattern was not consistent. This inconsistency is unsurprising given the very small number of children with functional difficulties in the Kakuma sample (33 across both control and intervention schools), and therefore results should be treated with caution. Among children with functional difficulties, the change in motor and socio-emotional development was lower in intervention schools (19 versus 37 in control schools respectively, and 14 versus 26), while the change in emergent literacy and numeracy was higher in intervention schools (24 versus 16 in control respectively, and 18 versus 9 in control).

School attendance and academic outcomes

Over the project duration, the availability of attendance records improved in both intervention and control schools. In intervention schools in Homa Bay, the proportion of children with attendance records increased from 72% at baseline to 93% at endline, and in control schools from 64% to 75%. In Kakuma, they increased from 67% to 72% in intervention schools, and from 56% to 60% in control schools.

In Homa Bay, among children with attendance records at both baseline and endline, 50% either improved their attendance or remained at full attendance throughout in intervention schools, compared to 42.5% in control schools. In Kakuma, among children with attendance records, 52.7% increased their attendance or remained at full attendance in intervention schools, compared to 27.1% in control schools.

Among children with academic outcome records at both baseline and endline, in Homa Bay intervention schools 88% met or exceeded expectations at baseline and 96% at endline, compared to 84% and 92% in control schools. In Kakuma, the proportion who met or exceeded expectations increased from 80% at baseline to 100% at endline in the intervention schools, and from 72% to 92% in the control schools.

Data and findings on school attendance and academic outcomes should be treated with caution, as many children had missing records. Academic outcomes data, in particular, was often incomparable across schools (heterogenous). Even when children's data was available, records were often incomplete.

Discussion and conclusion

The study generated several important pieces of evidence that need to be considered in future policies and programmes. Firstly, we found that a considerable number of children with functional difficulties attend pre-schools in Kenya: around 10% of all enrolled children in the study schools in Kakuma and approximately 20% in Homa Bay.

In contrast to common perceptions, we did not find any evidence that the developmental scores of children with functional difficulties were lower than those of children without functional difficulties, either at the start or end of pre-school. We also did not find evidence that the IDELA scores of children with functional difficulties changed on a different trajectory than those of children without functional difficulties.

It is important to note that IDELA scores would be expected to increase over time, as children grow and develop. However, extensive evidence exists demonstrating that in children without functional difficulties, attendance at ECDE significantly boosts early learning and development. Our data therefore suggests that in our sample, both children with and without functional difficulties benefitted equally from participation in ECDE. This is crucial additional evidence in support of the importance of ensuring that children with functional difficulties have access to, and are able to participate in, ECDE.

It is important to highlight that many children with very complex and profound disabilities are unlikely to be attending mainstream schools in study settings. Therefore, this study cannot say anything about their development scores, or how these change over time. Further studies of the developmental scores of children with complex disabilities receiving home-based educational support will be needed.

While our findings were broadly similar for both Homa Bay and Kakuma, the developmental scores of children in Kakuma refugee camps were lower than those in Homa Bay. This is not surprising, given that these children came from households significantly affected by displacement and often conflict. Children in this area also spoke a wide variety of languages, and often had no exposure to English or Kiswahili prior to starting school. This posed challenges for early learning in these languages, and also complicated the consistent administration of the IDELA. However, we did find that developmental scores of these

children improved over time at a rate similar to those in Homa Bay, indicating that they are continuing to develop, but may not be catching up. These findings highlight the particular importance of ECDE services for young children in humanitarian contexts.

Another important finding of this study was the high proportion of children who were found to have left ECDE services during their pre-primary schooling. This was observed in both regions for children with and without functional difficulties, and in both control and intervention schools. Further studies exploring the characteristics of children who left, and their reasons for dropping out, will be of great importance.

Finally, our study did not show any additional impact of the disability-inclusive ECDE interventions delivered by the project on child developmental scores. The changes in children's developmental scores in intervention schools were similar to the changes in control schools across both regions, overall and for children with functional difficulties. There are various factors which may have contributed to these results.

Firstly, the project included a broad range of activities, some of which (awareness raising, advocacy, community mobilisation) did not have a direct impact on the teaching and learning practices within schools. Secondly, although the project did deliver teacher training and capacity-building activities, this component was relatively small, and some of these interventions took a long time to put in place. Some teachers reported that they appreciated the capacity-building sessions on inclusive education but faced challenges in the application of the new skills in their classrooms due to the high student-to-teacher ratio. Thirdly, some children did not regularly attend ECDE, meaning that their exposure to improved teaching practices would have been limited. Teacher transfers also meant that trained teachers left schools during the trial period. Finally, due to the COVID-19 pandemic, children experienced compressed school years, which limited the duration of their exposure to the intervention.

Complementary qualitative research conducted during the project period reported that the interventions did have benefits that were not directly measurable by IDELA. These included better disability awareness in the community and reduced stigma around children with disabilities. We did additionally find some evidence of positive effects on the availability of attendance records in intervention schools, and also on children's attendance at ECDE. In both Homa Bay and Kakuma, more children in the intervention schools than in the control schools showed improvements in attendance rates during the study period. In Homa Bay, this was observed for all children, and for children with functional difficulties. In Kakuma, it was observed specifically for girls.

This is one of a small number of studies which have examined the relationship between early childhood development, education and disability in young children of pre-school age in sub-Saharan Africa. According to our knowledge, this is the first study to use the IDELA tool to measure developmental and learning outcomes for a specific sample of children with disabilities in sub-Saharan Africa, and the first to do this in a humanitarian setting.

The study generated interesting insights into the developmental trajectories of young children with and without disabilities, which will be of critical importance for inclusive education policies and programmes in Kenya and other similar settings.

1 Introduction

1.1 Inclusive early childhood development

The early years period (from birth to eight years of age) is a critical phase in a child's lifetime for their growth and development. Getting the foundations right during this phase carries significant future benefits, including better learning in school and higher educational attainment – both of which result in major social and economic gains for individuals and society (1). Although important progress has been made in supporting child development in recent decades, millions worldwide do not receive adequate nutrition, stimulation and responsive care, and continue to be exposed to unhealthy environments, violence and stress (2). These disadvantages are even more pronounced for the 240 million children with disabilities, who face additional barriers that undermine their development and education (3).

Child development can be facilitated through effective early years interventions. To ensure that children with disabilities are not disadvantaged, such interventions should be disability inclusive. This involves strengthening the capacities of national education systems to be more responsive to the individual needs of all learners, regardless of their personal characteristics. Inclusive early child development and education (ECDE) practices include a broad range of interventions, which focus on community norms, school infrastructure, teacher competencies and skills and government policies (3).

Although there is a general consensus about the importance of ECDE, there is less agreement on which interventions should be prioritised, particularly for disadvantaged groups (4). It is therefore critical to invest in research which measures the effectiveness of specific interventions and tests the theories of change and assumptions underpinning them. Such research can help determine education practices, which give better results and value for money (5). However, there is a dearth of such quality research to adequately guide policy and planning (6), especially in rural and humanitarian settings in sub-Saharan Africa.

1.2 Kenyan context

The government of Kenya has adopted a number of laws and policies pertaining to the inclusion of people with disabilities in society, including those that focus specifically on children (7-9). The Kenya Integrated Early Childhood Development Policy Framework, for example, states that State Parties shall ensure an inclusive education system at all levels (6), while the country's Vision 2030 strategy outlines specific measures to improve the progress of children with disabilities in education (9). Despite these government commitments, little reliable data exists on the prevalence and types of disabilities experienced by children attending schools and ECDE settings in Kenya (10). There is also scarce evidence on the impact of more inclusive education practices on child development and education outcomes.

The study presented here was an integral part of the Disability Inclusive Development (DID) Early Childhood Development and Education project delivered by the Kenyan government in collaboration with a consortium of international non-governmental organisations (iNGOs) and organisations of persons with disabilities (OPDs) in selected schools in Homa Bay and Turkana counties. The study generated new evidence on the participation of children with disabilities in ECDE in Kenya and assessed the impact of inclusive ECDE interventions on early child development and learning.

1.3 Intervention description

In 2021, the Ministry of Education of Kenya, together with several iNGOs and academic partners – namely Sightsavers, Humanity & Inclusion, Leonard Cheshire Disability, Sense International and Institute of Development Studies – developed an inclusive ECDE project with the aim of promoting inclusive ECDE in pre-school settings in Kenya. The project was an integral part of a larger disability programme funded by the UK Aid.

The ECDE project in Kenya included a range of activities and interventions, which focused on the child, family, community, education providers and policymakers. School-level interventions were implemented in six schools in Homa Bay county and three schools in Turkana county. In Homa Bay, the selected schools were from both rural and peri-urban locations, and the three schools in Turkana were located in and around the Kakuma refugee camp and Kalobeyei settlement in Turkana West sub-county. Interventions evolved over the duration of the project and were adapted to the local contexts as required, resulting in some differences in the implementation between the study sites. A summary of the key interventions delivered at different levels is outlined below and a detailed description is available from Sightsavers:

- **Provision of continuous professional guidance and development to teachers**. This was to enhance teachers' skills and knowledge on inclusive education to provide quality comprehensive support to learners with disabilities. Since June 2021 in Homa Bay and August 2021 in Turkana, teachers have been trained on disability awareness and inclusion, the rights of children with disabilities to education, inclusive classroom practices, accessible play-based learning, caregiver engagement and empowerment, competency-based curriculum (CBC), individualised education plans and safeguarding.
- **Capacity building of school leadership and the establishment and training of nine school-based inclusion teams (SBITs)**. Following initial capacity-building for school leadership and management, SBITs were established at different time points in 2021 and 2022 in both counties. These were composed of members of the school administration, OPDs, school management boards and some parents. These SBITs held regular school-level meetings ensuring all stakeholders were appropriately engaged. These teams also established support networks for caregivers, undertook accessibility audits, developed inclusion action plans and identified strategies such as periodic progress reviews in order to improve the transition of learners from ECDE to grade one. Members of the SBITs were trained in the following areas:
  - Conducting school inclusion assessments
  - Dissemination of assessment reports
  - Conducting accessibility audits
  - Formulating and following up on the progress of action plans based on accessibility audits
  - Resource mobilisation/fundraising
- **Training of parents and caregivers on positive parenting strategies**: In 2022, a training manual was developed and used to train parents and caregivers of children with disabilities. Following this, caregiver support groups were formed at each school and lead caregiver champions were appointed to develop action plans to cascade the training. Parents met during monthly peer-to-peer learning sessions in schools, starting in May 2022 in Turkana and August 2023 in Homa Bay. Support for caregivers included

psychosocial support, a transport buddy system, financial literacy, guidance on referral systems and making play materials. Parents were encouraged to become more involved in the education of their children with disabilities and participate in school activities as stakeholders.

- **Improvement of physical accessibility of school environments and accessibility audits**. The environment of one school in Turkana was made more physically accessible for learners with disabilities. This included building ramps, levelling playgrounds and improving the accessibility of classroom doors, offices and toilets, and was completed to provide other schools with a model to learn from. Members of SBITs in all schools received training on how to carry out accessibility audits and develop action plans to address accessibility barriers. In addition, all schools were supported on how to identify and access local funding to support their own adaptations in a sustainable way.
- **Training of learner support assistants (LSAs) in Homa Bay**. This was to support 45 learners with complex disabilities in Homa Bay who were undertaking home-based education. These children were thought to have severe impairments, which would prevent them from joining the mainstream schools at the time of the study, although only a quarter of these children had clinically diagnosed health conditions. The children were of different ages, including 17 (37.8%) of pre-primary age and the remaining 28 of primary school age (six to 14 years). Six children were deafblind, 10 had cerebral palsy with low vision and/or hearing impairments and the remaining 29 were recorded as having physical impairments with additional disabilities, with no further detail. The project supported these home-based learners to attend therapy sessions and 15 learners were prepared to transition to school-based education.
- **Opening of a play and learning centre at one of the project schools in Homa Bay**. Here, parents of children with disabilities who were supported through home-based education met for peer-to-peer learning and support, whilst their children socialised and played with their peers.
- **Training and placement of LSAs in Kakuma schools**. LSAs were trained to support the inclusion of children with disabilities attending mainstream ECDE, and one was stationed in each intervention school in Turkana from November 2021 through to the end of the intervention period.
- **Advocacy training to representatives of OPDs and 56 education officials on disability and inclusive education**. The training was conducted in February 2022 in Homa Bay and in May 2022 in Kakuma. This were followed by a validation session in Kakuma in September 2022, which included additional stakeholders who had missed the May training. The training aimed to strengthen the participants' understanding of the advocacy process and how it can be integrated in their roles at county and national level, while aligning to the county, national and global advocacy priorities.
- **Additional advocacy and policy activities**. In Homa Bay, support to county government enabled the development of a road map towards an ECDE inclusive policy, as well as

review, validation, endorsement and adoption of a more disability-inclusive school monitoring tool. In Turkana, OPDs were capacitated for stronger engagement in country level planning and budgeting processes, in order to support greater awareness and budgeting for disability inclusion.

1.4 Objectives of this study

The study aimed to generate critical evidence on early child development and the education of children with disabilities. It also aimed to assess the impact of disability-inclusive education practices on the developmental and learning outcomes of all children enrolled in ECDE, including children with and without disabilities. This report presents results of this impact evaluation.

Baseline results (collected at the beginning of the project) were presented in a separate report and can be found here.

2 Methods

2.1 Study design and sampling

Details of the study, including the design and sampling processes, were described in the baseline report (11). Briefly, this was a school-based cluster non-randomised controlled trial of a package of interventions designed to promote disability-inclusive ECDE in pre-schools in Homa Bay and Turkana Counties in Kenya. The schools were purposively selected in consultation with education stakeholders and iNGOs supporting the interventions. In Homa Bay, the schools were spread across sub-counties, while in Turkana the schools were located in and around the Kakuma refugee camp.

For the purpose of this report, we will use ‘Kakuma’ instead of ‘Turkana’, to indicate this study area. Control schools in each site (six in Homa Bay and three in Kakuma) were selected to match intervention schools based on their size and location, but to avoid potential contamination. Control schools did not receive any interventions during the study period, but received training, play and learning materials to support children with disabilities at the end of the intervention period.

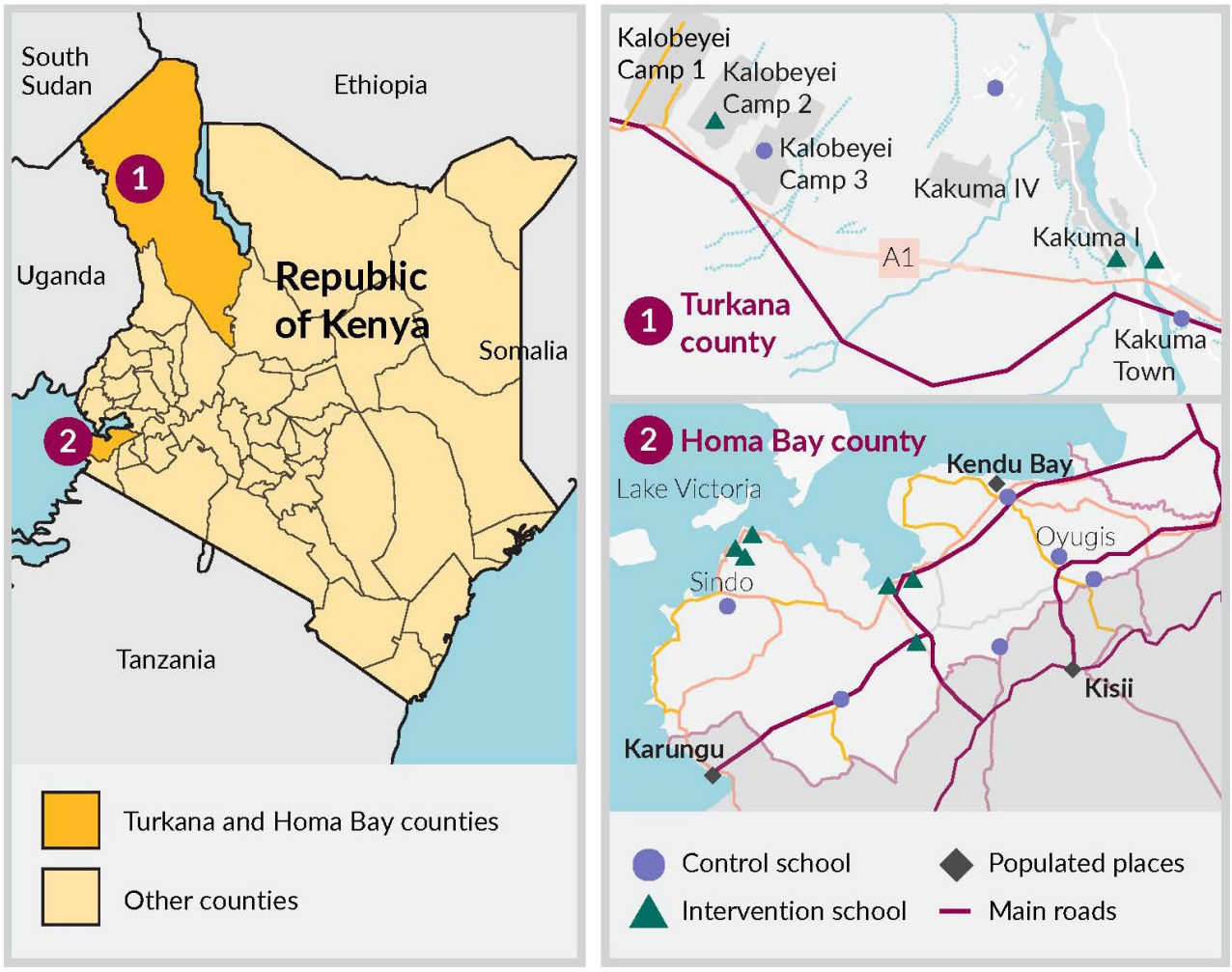

Figure 1: Location of intervention and control schools in Homa Bay and Turkana Counties in Kenya

2.2 Study population

Due to the lack of data to adequately inform calculation of a suitable sample size, the sample size at baseline was guided by resource availability and practical considerations. With an anticipated enrolment of 50 children per school per year, the expected sample size was around 100 children per school (recruited over two academic years), and an overall total of 1,800 children – 1,200 in Homa Bay and 600 in Kakuma – evenly distributed across control and intervention arms. At baseline, all children who started their first year of pre-school education (PP1 or pre-primary 1) in 2021 and 2022 at each of the 18 (nine intervention and nine control) schools were eligible for enrolment. Only children who were enrolled at baseline were eligible to participate in endline data collection activities.

2.3 Study instruments and data collection

The tools used during the baseline data collection were described in the baseline report (11) and are available in the appendices. These included a demographic questionnaire (Appendix A), the Kenya Equity Tool to assess household relative wealth (Appendix B) and the UNICEF/ Washington Group Child Functioning Module (CFM) to assess child disability status (Appendix C). These tools were administered to the child's main caregiver.

The International Development and Early Learning (IDELA) tool was directly administered to the children to assess their developmental scores. The IDELA was developed by Save the Children and applied in more than 100 countries worldwide. It assesses young children's skills across four domains – motor development, socio-emotional development, emergent literacy and emergent numeracy – assigning scores between zero and 100 for each domain and overall (12). Before data collection, the tool was further adapted with support from Save the Children for use with children with different disabilities.

The IDELA tool was used twice in this study: at the beginning of PP1 when children enrolled in schools (baseline) and towards the end of PP2 after these children had attended about five terms of the pre-school education, with inclusive interventions supported by the project (endline). The developmental score change was the primary outcome measured in the trial.

The trial also assessed the effect of the intervention on school attendance and educational performance. Data on school attendance was extracted from school registers, and child attendance rate was calculated as the number of days the child attended school as a proportion of the number of school days in a particular term. Educational performance data was extracted from individual CBC assessment books and/or progress reports, which were routinely completed by pre-school teachers. All data was collected electronically using the CommCare (13) data collection application installed on tablets.

It is important to note that there had been disruptions in the traditional occurrence of school terms in 2021 and 2022 due to the COVID-19 pandemic and school closures. Children in the first cohort were enrolled in September and October 2021, when their baseline data was collected. Their endline data was collected in October and November 2022. Those in the second cohort were enrolled in May and June 2022, with their endline data collected in September and October 2023.

Education data was collected termly. It involved the study team visiting each school and extracting data of the previous term's attendance and individual CBC assessments. Each cohort of children attended six terms: three in PP1 (terms one to three) and three in PP2 (terms four to six). The very first term of the first study year (term one for cohort 1) was used to set up data collection processes; therefore, the baseline education data was collected in term two of PP1 for cohort 1, and term one of PP1 for cohort 2. The endline education data was collected in term six of PP2 for cohort 1 and term five of PP2 for cohort 2. Table 1 summarises data collected during different data collection time points.

Table 1: Data collection time points for cohorts 1 and 2

Year	Month	IDELA data	Education data
2021	September-October	Baseline for Cohort 1	N/A
2022	February	N/A	Cohort 1 Baseline: PP1 Term 2
	May-June	Baseline for Cohort 2	
	August-September	N/A	Cohort 2 Baseline: PP1 Term 1
	October-November	Endline for Cohort 1	
2023	February-March	N/A	Cohort 1 Endline: PP2 Term 3
	September-October	Endline for Cohort 2	Cohort 2 Endline: PP2 Term 2

Data collection team and training

Assessors were recruited locally and trained prior to each round of data collection. Some assessors (more common in Homa Bay) participated in all rounds of IDELA data collection. The number of assessors per each round of IDELA data collection ranged between 12 and 16. Education data was collected by three to four LSAs in Kakuma and one to four assessors in Homa Bay. These numbers depended on the context, workload and school term duration.

The IDELA assessors were trained over a period of three to five days prior to data collection, while training for education data collection took approximately half a day.

2.4. Data analysis

Data was downloaded in .csv format and analysed using R version 4.2.1 (14).

Data was analysed separately for each of the study areas due to the widely different contexts of these settings. Data from both cohorts of children (those entering PP1 in July 2021 and in April 2022) was pooled for analysis.

Variable derivation

Attrition

Attrition was defined on the basis of the primary outcome of the study: IDELA scores. A child with a baseline IDELA who was not administered an IDELA at endline was considered as having attrited.

Functional difficulty

We analysed caregiver responses to the CFM using standard cut-offs to determine whether a child had a functional difficulty. We use functional difficulty as a proxy for disability throughout this report.

Types of functional difficulty

For analysis purposes, functional difficulties were grouped by broad categories to enable exploratory analyses across types of functional difficulties (original domains could not be used due to small numbers).

The broad categories were defined as follows:

- Physical, sensory, communication or self-care difficulty, which includes difficulties in seeing, hearing, walking, picking small objects (ages two to four), self-care (for ages five or over) or communication.
- Behavioural or emotional, which includes difficulties in behaviour, playing, accepting change and making friends, as well as anxiety or depression.
- Cognitive difficulty, which includes difficulties in learning, concentrating or remembering.

IDELA scores

A completed IDELA generates scores in four key domains (emergent literacy, emergent numeracy, motor development and socio-emotional development), in addition to providing an overall aggregated score (**11**, **12**, **15**). The IDELA scores were calculated, by domain and overall, using the computation guide devised by Save the Children (**15**). Overall IDELA scores, and those for each domain, are given out of 100 and represent an average percentage of correct answers.

Education data

A child's attendance rate was defined as the percentage of school days they were recorded as having attended within the term of interest.

A child was considered to have improved attendance rates between baseline and endline if their attendance rates at endline were higher than at baseline, or if they already had full attendance (100% attendance rate) at baseline and remained at 100% at endline.

Due to the high levels of heterogeneity observed in the data collection of academic outcomes, academic performance was defined in a simple manner for analysis purposes. The possible scores under the CBC assessments were: below expectations, approaches expectations, meets expectations and exceeds expectations. A child was considered to have performed academically if they met or exceeded expectations in at least one subject at endline and did not meet or exceed expectations in any subjects at baseline, or if they also met or exceeded expectations in at least one subject at baseline.

Statistical analyses

Balance of characteristics between study arms

We described sample characteristics, and assessed differences between control and intervention groups, among all children registered for the study, and among the subset of children retained for impact evaluation analyses. Due to the clustered nature of the data, characteristics were compared between arms using mixed models to account for clustering at school level, with each characteristic as the outcome and study arm as the fixed effect.

Attrition

Patterns of association between attrition and study arm, baseline characteristics and baseline IDELA score were assessed using univariable logistic regression models with attrition as the outcome. Robust clustered standard errors were used to account for clustering within schools.

IDELA scores

Impact evaluation analyses on IDELA scores were conducted on the subset of children who had a baseline and an endline IDELA score. We described the distribution of IDELA scores at baseline and endline using the median and interquartile range (IQR) by study arm, and further disaggregated by functional difficulty status and sex.

We also described the distribution of change in IDELA scores (score at endline – score at baseline) in a similar manner.

We used a difference-in-difference approach to evaluate the impact of intervention on IDELA scores. The modelled outcome was the within-person change in IDELA (i.e. for each child we calculated the difference between their IDELA score at endline and their IDELA score at baseline, for the total IDELA score and for each of the IDELA domains). Simply put, the difference-in-difference approach implies two differences: the difference between endline and baseline, and the difference in this change over time between control and intervention groups.

This approach allows us to cancel out any time-varying effects that impact the outcome in control and intervention groups in a similar manner, as well as the effects of any time-invariant characteristics associated with the outcomes that might differ between control and intervention group (i.e. assuming that these differences between intervention and control groups are constant over time).

Given that IDELA scores are closely correlated to age (i.e. as children grow, developmental and early learning scores increase), we first conducted univariate modelling controlling for age, and explored the patterns of association between change in IDELA scores and the following covariates: age, sex, functional difficulty status, presence of physical/sensory/communication/self-care difficulty, presence of behavioural difficulty, presence of cognitive

difficulty, household relative wealth, household composition, cohort (which was a proxy for duration of exposure to the intervention) and rural/peri-urban location (for Homa Bay).

The measures used to evaluate the impact of the intervention on IDELA scores were the age-adjusted difference-in-difference estimate resulting from the univariate model, examining the association between study arm and change in IDELA (while controlling for age), and the fully adjusted difference-in-difference estimate resulting from the multivariable model examining the association between study arm and change in IDELA (while controlling for age, sex, relative wealth, living with both parents or not, functional difficulty status, cohort – a proxy for study duration – and rural/peri-urban location [for Homa Bay]).

For these analyses, we used linear regression models with robust standard errors accounting for clustering within schools. In a second step, we explored potential heterogeneous effects of the intervention on different subgroups by testing for interactions of intervention with covariates of interest (functional difficulty and sex).

Where sample size allowed, we conducted further exploratory analyses among the subset of children with functional difficulties using difference-in-difference modelling.

We conducted sensitivity analyses using matching on the baseline covariates. The intervention effect was estimated using a linear regression model with change in IDELA total score as the outcome, including the covariates used for matching in the model (and accounting for the matching weights) and using clustered standard errors to account for matching.

Education data

Education data was described and analysed among the subset of children retained for the IDELA impact evaluation analyses for consistency.

Data availability was described in control and intervention schools using the mean proportion of children who had attendance or academic outcome data available across these schools, at baseline and endline.

For children who had available attendance data, we presented the median of children's attendance rates by study arm, and disaggregated further by sex and functional difficulty status, at baseline and endline.

For children who had academic outcomes data available, we presented the proportion of children who met or exceeded expectations in at least one subject, among control and intervention schools, and further disaggregated by functional difficulty status and sex, at baseline and endline.

The outcome used for analyses was the improvement in attendance rates and academic performance, as described in the previous subsection (variable derivation). We presented the proportions of those with improved attendance rates, as well as those who performed academically, by study arm, and further disaggregated by functional difficulty and sex.

Differences between control and intervention arms in the proportion of children with improvement in attendance rates – and academic performance among children who had data available for these outcomes at both baseline and endline, overall and within the various subgroups of interest – were tested for statistical significance using chi-square tests or Fisher's exact tests when the sample size was small. Multiplicity of statistical testing was accounted for using Bonferroni correction, and such adjusted p-values were denoted padj.

Improvement in attendance rates and academic performance were analysed using univariate and multivariable logistic regression models, with robust standard errors accounting for clustering within schools, with study arm as the exposure of interest and age, sex, relative wealth, functional difficulty status, cohort, household composition and rural/peri-urban setting (for Homa Bay) as covariates.

The research findings were disseminated at county and national levels to different stakeholders and education actors in December 2023.

2.5. Ethical considerations

Ethical approval for this study was obtained from the Strathmore University Science and Ethics Committee in Kenya, with reference number SU-IERC1019/21. A research licence (NACOSTI/P/23/24281) to conduct the study was also obtained from the National Commission for Science, Technology and Innovation (NACOSTI). Authorisation to carry out research activities within schools was obtained from the Ministry of Education, county and sub-county departments of education, and school management.

Prior to baseline data collection, written informed consents for the participation of carers, as well as their children, were obtained. In addition, assent was also obtained from each participating child both at baseline and endline.

Throughout data collection and analysis, particular care was taken to support children with disabilities and to manage potential risks related to child protection and safeguarding, protection of confidentiality, voluntary participation, minimising demands on participant time and potential emotional upset.

3 Results

3.1 Study sample and demographic characteristics

As previously described, the study areas have marked contextual and socio-economic differences. Results should therefore be considered separately for each area, rather than in comparison.

Study flow

A total of 1,748 children were enrolled in the study: 1,074 (61%) in Homa Bay and 674 (39%) in Kakuma. These figures differ slightly from those in the baseline report as a result of additional data cleaning, which led to case closures and the removal of a few additional duplicate records.

Among those enrolled in Homa Bay, 1,030 (96%) children were administered the IDELA tool at baseline. Among those with an IDELA score at baseline, 747 (73%) were also administered the IDELA at endline.

Among those enrolled in Kakuma, 585 (87%) children were administered the IDELA at baseline. Nine children were excluded from the IDELA analyses due to their young age (under three years). Among those with an IDELA score at baseline who were retained for analyses, 373 (65%) were also administered the IDELA at endline.

The impact evaluation analyses were conducted on the subset of children who were retained for IDELA analyses and had both a baseline and an endline IDELA.

Participant characteristics

Homa Bay

Participant characteristics were described in detail in the **baseline report**.

Here we focus on describing participant characteristics by study arm, among those enrolled in the study and those retained for the impact evaluation analyses (Table 2).

Participant characteristics were generally similar across study arms. However, the distribution of sex, cohort and household composition differed significantly between control and intervention arms. Among those in the intervention arm, there were significantly more girls, more children in cohort 1 and more children who lived with both their parents compared to those in the control arm.

The distribution of participant characteristics among children retained for impact evaluation analyses was generally similar to that of the children enrolled in the study, with the same statistically significant differences observed between intervention and control arms.

Table 2: Participant characteristics by study arm – Homa Bay

		Enrolled in study		P	Retained for impact evaluation analyses		p
		Control	Intervention		Control	Intervention	
Sex	Boys	307 (55.7%)	246 (47.0%)	0.03	218 (55.2%)	167 (47.4%)	0.03
	Girls	244 (44.3%)	277 (53.0%)		177 (44.8%)	185 (52.6%)	
Age at enrolment	Median [IQR]	4[4,5]	4[4,5]	0.75	4[4,5]	4[4,5]	0.61
Relative wealth quintiles	Poorest (Q1-Q2)	248 (45.0%)	189 (36.2%)	0.52	188 (47.6%)	142 (40.3%)	0.52
	Wealthier (Q3-Q5)	303 (55.0%)	333 (63.8%)		207 (52.4%)	210 (59.7%)	
Functional difficulty status	No functional difficulty (FD)	444 (80.7%)	411 (79.5%)	0.85	317 (80.5%)	279 (80.2%)	0.85
	With functional difficulty (FD)	106 (19.3%)	106 (20.5%)		77 (19.5%)	69 (19.8%)	
Presence of physical, sensory, communication or self-care difficulty		43 (7.8%)	55 (10.6%)	0.51	30 (7.6%)	33 (9.4%)	0.51
Presence of behavioural or emotional difficulty		63 (11.4%)	63 (12.1%)	0.70	44 (11.1%)	42 (12.0%)	0.70

		Enrolled in study		P	Retained for impact evaluation analyses		p
Presence of cognitive difficulty		37 (6.7%)	28 (5.4%)	0.35	27 (6.8%)	15 (4.3%)	0.35
Rural/peri-urban status	Peri-urban	253 (45.9%)	243 (46.5%)	0.98	178 (45.1%)	162 (46.0%)	0.98
	Rural	298 (54.1%)	280 (53.5%)		217 (54.9%)	190 (54.0%)	
Cohort	Cohort 1	302 (54.8%)	313 (59.8%)	<0.01	211 (53.4%)	232 (65.9%)	<0.01
	Cohort 2	249 (45.2%)	210 (40.2%)		184 (46.6%)	120 (34.1%)	
Household composition	Living with both parents	349 (63.3%)	346 (66.3%)	0.03	254 (64.3%)	252 (71.6%)	0.03
	Not living with both parents	202 (36.7%)	176 (33.7%)		141 (35.7%)	100 (28.4%)	

Kakuma

Participant characteristics (Table 3) were generally balanced across study arms. Only the distribution of relative wealth differed, with a lower proportion of children being from the two poorest quintiles in the intervention arm compared to the control arm. However, it is worth noting that the overwhelming majority of children in this area (in both intervention and control schools) were from the two poorest quintiles and were much poorer than the average population of Kenya.

Participant characteristics among those retained for impact evaluation analyses were broadly similar to the characteristics of those who enrolled, with the same patterns observed regarding relative wealth.

Table 3: Participant characteristics by study arm – Kakuma

		Enrolled in study		P	Retained for impact evaluation analyses		p
		Control	Intervention		Control	Intervention	
Sex	Boys	165 (50.0%)	175 (50.9%)	0.72	86 (49.4%)	102 (51.3%)	0.72
	Girls	165 (50.0%)	169 (49.1%)		88 (50.6%)	97 (48.7%)	
Age at enrolment	Median [IQR]	4[3,5]	4[4,5]	0.58	4[3,4]	4[4,5]	0.38
Relative wealth quintiles	Poorest (Q1-Q2)	307 (93.0%)	283 (82.3%)	0.01	163 (93.7%)	164 (82.4%)	0.01
	Wealthier (Q3-Q5)	23 (7.0%)	61 (17.7%)		11 6.3%)	35 (17.6%)	
Functional difficulty status	No functional difficulty (FD)	306 (92.7%)	307 (89.8%)	0.32	162 (93.1%)	177 (89.4%)	0.32
	With functional difficulty (FD)	24 (7.3%)	35 (10.2%)		12 (6.9%)	21 (10.6%)	
Presence of physical, sensory, communication or self-care difficulty		13 (3.9%)	24 (7.0%)	0.14	5 (2.9%)	14 (7.1%)	0.14

		Enrolled in study		P	Retained for impact evaluation analyses		p
Presence of behavioural or emotional difficulty		10 (3.0%)	11 (3.2%)	0.75	8 (4.6%)	7 (3.5%)	0.75
Presence of cognitive difficulty		3 (0.9%)	3 (0.9%)	0.40	1 (0.6%)	3 (1.5%)	0.40
Cohort	Cohort 1	185 (56.1%)	177 (51.5%)	0.88	101 (58.0%)	114 (57.3%)	0.88
	Cohort 2	145 (43.9%)	167 (48.5%)		73 (42.0%)	85 (42.7%)	
Household composition	Living with both parents	193 (58.5%)	212 (61.6%)	0.25	109 (62.6%)	136 (68.3%)	0.25
	Not living with both parents	137 (41.5%)	132 (38.4%)		65 (37.4%)	63 (31.7%)	

3.2 Attrition

Homa Bay

Overall, sample attrition for purposes of the IDELA endline analysis was 283 children, or 27% of those with a baseline IDELA.

Reasons recorded for attrition are given in Table 4. The vast majority of attrition was due to children having left the school (91% of attrition in control schools, 84% in intervention schools). The proportion of attrition due to being in grade 1 was higher in the intervention (14%) than the control group (4%).

Table 4: Reasons for attrition – Homa Bay

Reason	Control	Intervention
Child absent	4 (2.9%)	1 (0.7%)
Child left school	124 (90.5%)	122 (83.6%)
Child in grade 1	6 (4.4%)	20 (13.7%)
Unknown	3 (2.2%)	3 (2.1%)

Attrition rates are described overall by participant characteristics in Table 5. Univariable models (p-values reported in Table 5) showed that attrition did not differ significantly between control and intervention groups, nor according to the baseline IDELA total scores (p=0.36). However, attrition was associated with household relative wealth and household composition: children who were from relatively wealthier quintiles (3-5) were more likely to experience attrition compared to those from the two poorest quintiles (meaning those from the poorest households were more likely to be retained). Those who did not live with both their parents were more likely to experience attrition than those who lived with both their parents (meaning those who lived with both their parents were more likely to be retained).

Table 5: Attrition rates description – Homa Bay

		Attrition rate	p1
Sex	Boys	141 26.8%)	0.74
	Girls	142 (28.2%)	
Age group	2-4	135 (25.7%)	0.33
	5+	148 (29.4%)	
Arm	Control	137 (25.8%)	0.47
	Intervention	146 (29.3%)	
Relative wealth quintile	Poorest (Q1-Q2)	88 (21.1%)	0.02
	Wealthier (Q3-Q5)	194 (31.8%)	
Functional difficulty status	Without FD	225 (27.4%)	0.93
	With FD	56 (27.7%)	
Presence of physical, sensory, self-care, or communication difficulty	Yes	29 (31.5%)	0.32
	No	252 (27.0%)	
Presence of behavioural or emotional difficulty	Yes	35 (28.9%)	0.76
	No	246 (27.2%)	
Presence of cognitive difficulty	Yes	17 (28.8%)	0.83
	No	265 (27.3%)	
Cohort	1	140 (24.0%)	0.09
	2	143 (32.0%)	
Rural/peri-urban setting	Peri-urban	136 (28.6%)	0.65
	Rural	147 (26.5%)	

[1] From logistic regression models (see methods)

		Attrition rate	p1
Household composition	Lives with both parents	160 (24.0%)	0.01
	Does not live with both parents	122 (33.6%)	

Kakuma

Overall, sample attrition for purposes of the IDELA endline analysis was 203 children, or 35% of those with a baseline IDELA.

Reasons recorded for attrition are given in Table 6. The majority of attrition was due to children being absent during the assessment period (36% of attrition in the control arm, 34% in the intervention arm) and having left the school (36% of attrition in the control arm, 32% in intervention arm). The proportion of attrition due to being in grade 1 was higher in the control (11%) than the intervention arm (5%). In Kakuma, there was also a substantial proportion of attrition due to identification issues, i.e. the teacher could not recognise children by their names (12% in control schools and 19% in intervention schools).

Table 6: Reasons for attrition – Kakuma

Reason	Control	Intervention
Child absent	39 (36.1%)	32 (33.7%)
Child left school	39 (36.1%)	30 (31.6%)
Child in grade 1	12 (11.1%)	5 (5.3%)
Identification issues	13 (12.0%)	18 (18.9%)
Sick or disability or other	2 (1.8%)	2 (2.2%)
Unknown	3 (2.8%)	8 (8.4%)

Attrition rates are described by participant characteristics in Table 7. Here, univariable models (with reported p-values) showed that attrition did not differ significantly between control and intervention groups, nor according to the baseline IDELA total scores (p=0.12). However, attrition was associated with household composition. Those who did not live with both their parents were more likely to experience attrition than those who lived with both their parents (meaning those who lived with both their parents were more likely to be retained).

Table 7: Attrition rates description – Kakuma

		Attrition rate	p2
Sex	Boys	99 (34.5%)	0.46
	Girls	104 (36.0%)	
Age group	2-4	131 (34.6%)	0.66
	5+	72 (36.5%)	
Arm	Control	108 (38.3%)	0.48
	Intervention	95 (32.3%)	
Relative wealth quintile	Poorest (Q1-Q2)	187 (36.4%)	0.29
	Wealthier (Q3-Q5)	16 (25.8%)	
Functional difficulty status	With FD	13 (28.3%)	0.39
	Without FD	189 (35.8%)	
Presence of physical, sensory, self-care, or communication difficulty	Yes	10 (34.5%)	0.94
	No	192 (35.3%)	
Presence of behavioural or emotional difficulty	Yes	2 (11.8%)	0.11
	No	201 (36.0%)	
Presence of cognitive difficulty	Yes	1 (20.0%)	0.51
	No	202 (35.4%)	
Cohort	1	91 (29.7%)	0.10
	2	112 (41.5%)	
Household composition	Lives with both parents	102 (29.4%)	<0.01
	Does not live with both parents	101 (44.1%)	

[2] From logistic regression models (see methods)

3.3 IDELA scores

Homa Bay

Total scores - description

As shown in Table 8 and Figure 2, the median IDELA total scores increased between the baseline and endline data collection points, and the increase was similar in the intervention and control arms. In the intervention arm, the median IDELA total scores increased by 19 points (20 points for girls, 18 for boys). In the control arm, the median IDELA total scores increased by 20 points (20 points for girls, 21 points for boys).

Median increases were generally similar across functional difficulty status in both study arms. Among children without functional difficulties, the median IDELA total scores increased by 19 points in the intervention arm and by 21 points in the control arm. Among children with functional difficulties, the median IDELA total scores increased by 20 points in the intervention arm and by 19 points in the control arm.

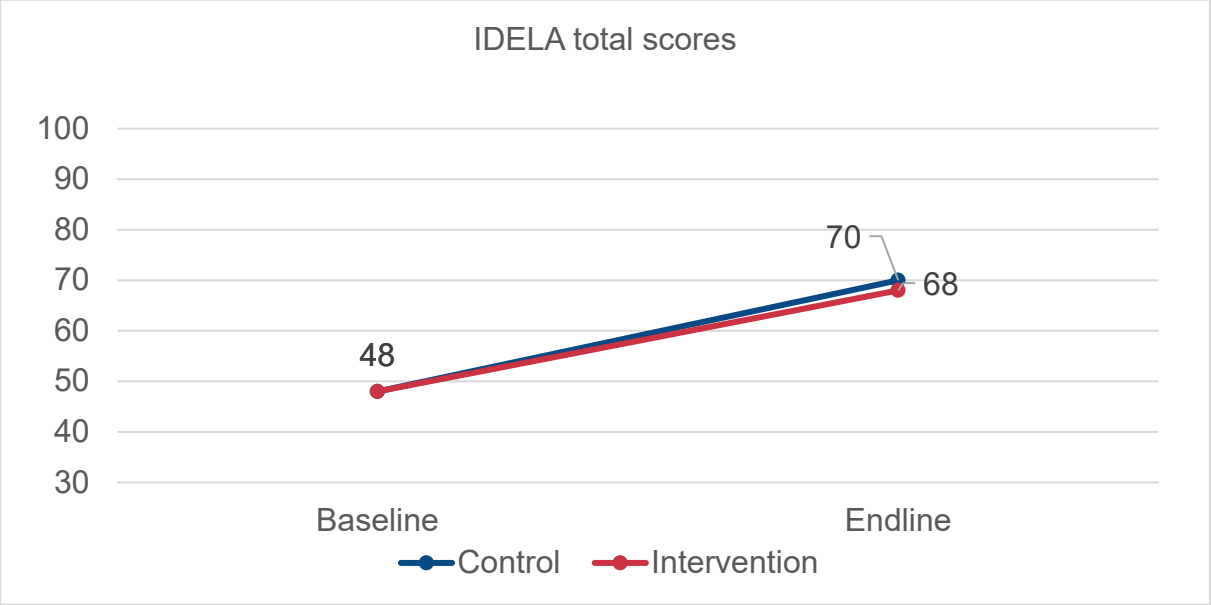

Figure 2: Median IDELA total scores by study arm at baseline and endline in Homa Bay

Table 8: IDELA total scores description (data is median [IQR]) – Homa Bay

	Control				Intervention			
	N	Baseline	Endline	Individual score change*	N	Baseline	Endline	Individual score change*
Overall	395	48[36,59]	70[59,77]	20[13,27]	352	48[35,59]	68[57,77]	19[12,27]
Girls	177	49[38,60]	71[61,78]	20[13,28]	185	49[35,58]	68[59,77]	20[13,27]
Boys	218	47[36,58]	70[58,77]	21[13,27]	167	47[34,60]	68[54,77]	18[10,26]
With functional difficulty	77	51[43,61]	72[65,80]	19[11,27]	69	49[33,60]	67[54,77]	20[11,27]
Without functional difficulty	317	48[35,59]	69[59,77]	21[13,28]	279	48[35,59]	69[58,77]	19[12,27]

* This value is the median of individual children's score change and does not align exactly to the difference between median baseline and endline scores.

Among children with functional difficulties only, no substantial differences were observed between control and intervention groups across the child's type of functional difficulty or sex although sample sizes were small at this level of disaggregation resulting in very wide confidence intervals (Table 9).

Table 9: IDELA total scores description (data is median [IQR]) – subset of children with functional difficulties – Homa Bay)

	Control				Intervention			
	N	Baseline	Endline	Individual score change*	N	Baseline	Endline	Individual score change*
Physical, sensory, communication or self-care difficulty	30	47[41,60]	70[58,77]	18[11,26]	33	44[29,59]	61[49,75]	17[9,27]
Behavioural or emotional difficulty	44	52[38,63]	74[66,81]	20[11,28]	42	49[35,60]	70[59,77]	22[15,26]
Cognitive difficulty	27	55[44,60]	72[68,79]	22[9,26]	15	42[23,56]	62[50,70]	19[12,26]
Girls	31	56[44,64]	73[67,81]	18[9,26]	29	49[33,60]	67[57,75]	22[10,28]
Boys	46	48[40,57]	71[64,79]	20[11,27]	40	48[33,59]	68[53,78]	19[11,27]

* This value is the median of individual children's score change and does not align exactly to the difference between median baseline and endline scores.

Total scores - model results

As shown in Table 10, univariate model results showed that change in IDELA was on average significantly smaller for older children, and higher for children from cohort 2. There were no statistically significant differences across sex or functional difficulty status.

There was no significant difference in change in total IDELA scores between control and intervention groups, and results remained similar when controlling for all the other covariates with the difference-in-difference estimate between intervention and control being -0.66 [-3.28, 1.96]. Results from the sensitivity matching analyses also supported these conclusions, with the estimated effect for intervention vs control being -1.26 [-3.75, 1.23]).

Interaction tests showed no evidence of heterogeneous effects of the intervention across functional difficulty status (p=0.82) nor sex (p=0.19), meaning there was no evidence that the effect of intervention differed across functional difficulty status nor sex.

Further exploratory analyses among the subset of children with functional difficulties did not reveal any significant difference between intervention and control arms (β=0.09 [-5.52, 5.71]) for univariate associations and (β =-0.01 [-5.41, 5.39]) when controlling for other covariates).

Table 10: Change in IDELA scores – age-adjusted univariate regression model results – data are estimates and associated 95% CI – Homa Bay

	Estimate [95% CI]	
Variable	Overall	Children with functional difficulties
Age	-1.44 [-2.14, -0.75]	-0.14 [-1.16, 0.89]
Arm: intervention vs control	-0.93 [-3.77, 1.90]	0.09 [-5.52, 5.71]
Sex: girls vs boys	0.21 [-1.11, 1.53]	-1.11 [-4.26, 2.04]
Relative wealth: wealthier (Q3-Q5) vs poorest (Q1-Q2)	0.41 [-2.50, 3.33]	1.76 [-4.30, 7.82]
With vs without functional difficulty	0.06 [-2.09, 2.21]	-
With vs without physical/sensory etc difficulty	-1.61 [-4.89, 1.67]	-2.38 [-6.51, 1.75]
With vs without behavioural difficulty	1.48 [-1.25, 4.21]	2.68 [-2.17, 7.53]
With vs without cognitive difficulty	0.64 [-3.85, 5.14]	-0.18 [-5.01, 4.65]
Cohort 2 vs Cohort 1	3.25 [0.13, 6.36]	-0.4 [-6.15, 5.35]
Rural vs peri-urban setting	0.34 [-2.40, 3.09]	-0.31 [-6.22, 5.59]
Household composition: not living with both parents vs living with both parents	-0.43 [-2.46, 1.61]	0.07 [-5.16, 5.31]

Motor scores - description

As shown in Table 11 and Figure 3, IDELA motor scores increased by a median of 19 points over time in the control arm (16 point for girls, 19 points for boys) and by 17 points in the intervention arm (20 points for girls, 18 for boys). Median increases were slightly higher in the intervention arm for those with functional difficulty (19 points versus 16 points in the control arm).

Among children with functional difficulties (Table 12), median increase in IDELA motor scores was slightly higher in the intervention arm for children with physical/sensory/communication difficulties (21 points versus 17 points in the control arm). Median increase in IDELA motor scores was also higher in the intervention arm for children with behavioural or emotional difficulties (16 points versus 12 points in the control arm). Median change in IDELA motor scores was higher for girls in the intervention arm (19 points) compared to girls in the control arm (12 points). Results must be interpreted with caution at this level of disaggregation due to small sample size.

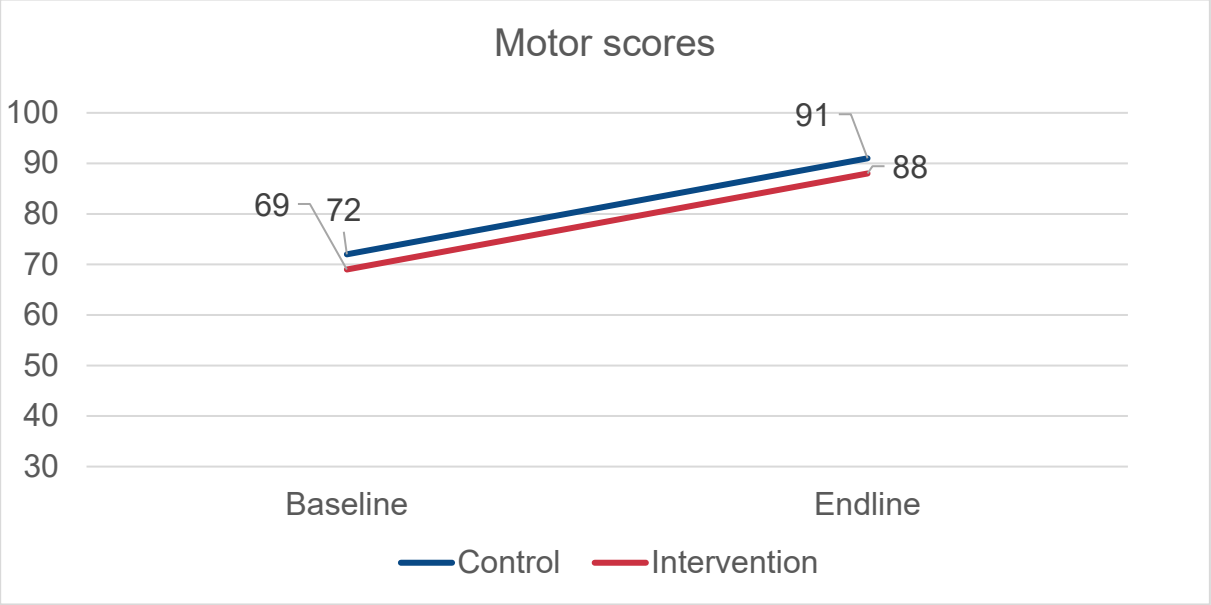

Figure 3 Median motor scores by study arm at baseline and endline in Homa Bay

Table 11: IDELA motor scores description (data is median [IQR]) – Homa Bay

	Control				Intervention			
	N	Baseline	Endline	Individual score change*	N	Baseline	Endline	Individual score change*
Overall	395	72[50,84]	91[81,100]	19[6,32]	352	69[47,84]	88[75,97]	17[6,34]
Girls	177	75[56,88]	94[83,100]	16[6,32]	185	72[48,84]	91[81,97]	19[6,34]
Boys	218	68[44,84]	88[78,97]	19[6,31]	167	66[39,81]	84[69,97]	16[6,34]
With functional difficulty	77	75[62,91]	94[85,100]	16[3,28]	69	66[41,81]	84[72,97]	19[6,36]
Without functional difficulty	317	69[47,84]	89[81,100]	19[6,32]	279	71[47,84]	88[78,97]	16[6,34]

* This value is the median of individual children's score change and does not align exactly to the difference between median baseline and endline scores.

Table 12: IDELA motor scores description (data is median [IQR]) – subset of children with functional difficulties – Homa Bay

	Control				Intervention			
	N	Baseline	Endline	Individual score change*	N	Baseline	Endline	Individual score change*
Physical, sensory, communication or self-care difficulty	30	73[58,86]	94[80,100]	17[3,33]	33	58[41,75]	79[67,94]	21[6,37]
Behavioural or emotional difficulty	44	75[53,91]	94[85,98]	12[3,28]	42	71[42,82]	84[72,97]	16[6,35]
Cognitive difficulty	27	75[53,92]	97[94,100]	19[3,36]	15	53[28,69]	75[61,86]	19[11,45]
Girls	31	75[69,94]	97[88,100]	12[3,23]	29	72[44,81]	88[75,97]	19[8,38]
Boys	46	69[45,88]	94[84,100]	19[4,33]	40	61[37,82]	80[68,91]	17[6,35]

* This value is the median of individual children's score change and does not align exactly to the difference between median baseline and endline scores.

Motor scores - model results

Univariate model results (Table 13) showed that change in IDELA motor scores decreased with age. Change in IDELA motor scores was significantly higher for children from cohort 2 compared to those from cohort 1. We did not find statistically significant differences in change in IDELA across sex, functional difficulty status, nor two of the three types of functional difficulty, physical/sensory/communication nor behavioural difficulties. However, change in motor scores were higher for those with cognitive difficulties versus those without cognitive difficulties.

There was no significant difference in change in motor IDELA scores between control and intervention groups (β=0.61 [-6.85, 8.06]). The multivariable model results were similar (β=1.5 [-5.67, 8.67]). Results from the sensitivity matching analyses drew the same conclusions (β= 0.64 [-3.04, 4.31]).

Interaction tests showed no evidence of heterogeneous effects of the intervention across groups across sex (p=0.13) or functional difficulty status (p=0.63).

Further exploratory analyses among the subset of children with functional difficulties did not reveal any significant association between change in IDELA and study arm (age-adjusted β=2.64 [-4.18, 9.45] and when controlling for all other covariates, β= 1.79 [-5.21, 8.79]).

Table 13: Change in IDELA motor scores – age-adjusted univariate regression model results – data are estimates and associated 95% CI – Homa Bay

	Estimate [95% CI]	
Variable	Overall	Children with functional difficulties
Age	-4.46 [-6.32, -2.6]	-0.73 [-2.55, 1.08]
Arm: intervention vs control	0.61 [-6.85, 8.06]	3.26 [-2.63, 9.15]
Sex: girls vs boys	-0.74 [-2.41, 0.93]	-1.39 [-9.02, 6.24]
Relative wealth: wealthier (Q3-Q5) vs poorest (Q1-Q2)	0.36 [-3.17, 3.88]	-3.01 [-10.85, 4.84]
With vs without functional difficulty	0.41 [-1.09, 1.9]	-
With vs without physical/sensory etc difficulty	0.03 [-3.63, 3.68]	0.46 [-4.54, 5.46]
With vs without behavioural difficulty	-0.18 [-5.35, 4.99]	-2.1 [-11.54, 7.35]
With vs without cognitive difficulty	8.24 [0.58, 15.89]	8.26 [-0.66, 17.19]
Cohort 2 vs Cohort 1	6.99 [0.72, 13.25]	2.08 [-5.7, 9.86]
Rural vs peri-urban setting	5.36 [-1.02, 11.73]	5.04 [-1.79, 11.88]
Household composition: not living with both parents vs living with both parents	0.68 [-3.64, 4.99]	1.58 [-10.51, 13.67]

Socio-emotional scores - description

As shown in Table 14 and Figure 4, the median change in IDELA socio-emotional scores was an increase by 16 points over time in the control arm (15 point for girls, 16 points for boys) and by 13 points in the intervention arm (13 for both boys and girls). Median increases were similar among those with functional difficulties in both study arms (15 points).

Among children with functional difficulties (Table 15), no substantial differences were observed between study arms across sex. Among children with behavioural or emotional difficulties, median change was higher among those in the control arm compared to the intervention arm, a respective increase by 20 points and 14 points. Conversely, median change was higher among children with cognitive difficulties for those in the intervention arm (increase by 17 points) compared to the control arm (increase by seven points). Sample

sizes at this level of disaggregation were small and results should be interpreted with caution.

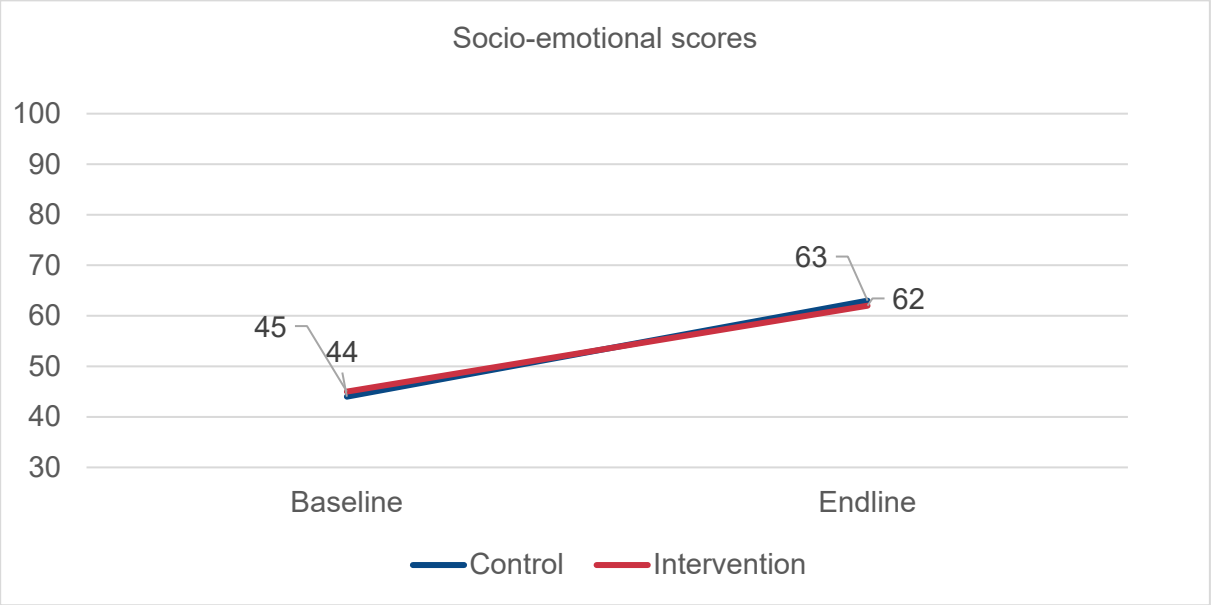

Figure 4: Median socio-emotional scores by study arm at baseline and endline in Homa Bay

Table 14: IDELA socio-emotional scores description (data is median [IQR]) – Homa Bay

	Control				Intervention			
	N	Baseline	Endline	Individual score change*	N	Baseline	Endline	Individual score change*
Overall	395	44[29,63]	63[48,75]	16[1,32]	352	45[29,63]	62[46,76]	13[0,28]
Girls	177	45[30,62]	62[47,75]	15[0,33]	185	44[29,60]	60[47,77]	13[-1,30]
Boys	218	44[28,64]	64[49,75]	16[2,31]	167	47[29,65]	63[45,75]	13[0,27]
With functional difficulty	77	52[34,65]	63[51,76]	15[0,28]	69	50[27,65]	60[51,73]	15[-2,25]
Without functional difficulty	317	42[28,62]	63[48,74]	16[2,34]	279	44[30,62]	63[46,77]	12[0,29]

* This value is the median of individual children's score change and does not align exactly to the difference between median baseline and endline scores.

Table 15: IDELA socio-emotional scores description (data is median [IQR]) – subset of children with functional difficulties – Homa Bay

	Control				Intervention			
	N	Baseline	Endline	Individual score change*	N	Baseline	Endline	Individual score change*
Physical, sensory, communication or self-care difficulty	30	50[30,61]	57[43,69]	13 [-13,28]	33	51[23,65]	62[47,69]	15[1,28]
Behavioural or emotional difficulty	44	50[31,66]	63[51,79]	20[-1,29]	42	50[29,65]	64[50,74]	14[3,21]
Cognitive difficulty	27	61[47,68]	66[55,76]	7[-4,25]	15	37[26,65]	54[48,67]	17[-9,27]
Girls	31	53[36,63]	63[53,78]	15[2,26]	29	51[27,64]	60[46,73]	13[-5,22]
Boys	46	50[34,66]	62[50,76]	14[-3,29]	40	49[27,65]	62[51,72]	16[3,32]

* This value is the median of individual children's score change and does not align exactly to the difference between median baseline and endline scores.

Socio-emotional scores - model results

Univariate model results (Table 16) showed that change in IDELA socio-emotional scores was significantly higher for children from cohort 2 than children from cohort 1. We did not find statistically significant differences in change in IDELA across sex, functional difficulty status or type of functional difficulty.

Univariate age-adjusted model results showed no significant difference in change in socio-emotional IDELA scores between control and intervention arms (β=-0.93 [-6.63, 4.77]). Multivariable model results controlling for all covariates confirmed this result (β=-0.30 [-5.96, 5.37]). Results from the sensitivity matching analyses also supported these conclusions, with the estimated effect for intervention vs control being 0.35 [-3.72, 4.42].

Interaction tests showed no evidence of heterogeneous effects of the intervention across functional difficulty status (p=0.77) or sex (p=0.23).

Further exploratory analyses among the subset of children with functional difficulties did not reveal any significant association between change in IDELA score and study arm, in both univariate age-adjusted models (β=1.11 [-9.93, 12.15] for intervention vs control) and multivariable models controlling for all other covariates (β= 0.65 [-11.02, 12.33]).

Table 16: Change in IDELA socio-emotional scores – age-adjusted univariate regression model results – data are estimates and associated 95% CI – Homa Bay

	Estimate [95% CI]	
Variable	Overall	Children with functional difficulties
Age	-0.26 [-1.98, 1.46]	-0.33 [-4.94, 4.27]
Arm: intervention vs control	-0.93 [-6.63, 4.77]	1.11 [-9.93, 12.15]
Sex: girls vs boys	0.71 [-2.37, 3.8]	-1.97 [-7.65, 3.71]
Relative wealth: wealthier (Q3-Q5) vs poorest (Q1-Q2)	-3.14 [-6.45, 0.16]	0.63 [-11.25, 12.5]
With vs without functional difficulty	-2.24 [-7.61, 3.12]	-
With vs without physical/sensory etc difficulty	-2.71 [-9.93, 4.52]	-1.31 [-10.13, 7.52]
With vs without behavioural difficulty	-0.94 [-5.7, 3.82]	2.33 [-4.66, 9.32]
With vs without cognitive difficulty	-6.79 [-15.42, 1.84]	-6.81 [-14.24, 0.62]
Cohort 2 vs Cohort 1	3.5 [0.08, 6.92]	1.82 [-3.5, 7.15]
Rural vs peri-urban setting	-0.18 [-5.71, 5.35]	-1.37 [-13.43, 10.68]
Household composition: not living with both parents vs living with both parents	0.29 [-3.59, 4.17]	0.86 [-7.24, 8.95]

Emergent literacy scores - description

As shown in Table 17 and Figure 5, the median change in IDELA emergent literacy scores was an increase by 24 points over time in the control arm (25 point for girls, 23 points for boys) and by 21 points in the intervention arm (21 points for girls, 21 points for boys). Median increase was slightly higher in the control arm for those with functional difficulties (25 points in the control arm, 22 points in the intervention arm).

Among children with functional difficulties (Table 18), no substantial differences were observed between study arms across sex. Among children with behavioural or emotional difficulties, median change was higher among those in the control arm compared to the intervention arm (respectively increase by 29 points and 23 points). Similarly, median

change was higher among children with cognitive difficulties for those in the control arm (increase by 27 points) compared to the intervention arm (increase by 21 points). Sample sizes at this disaggregation level were small and results should be interpreted with caution.

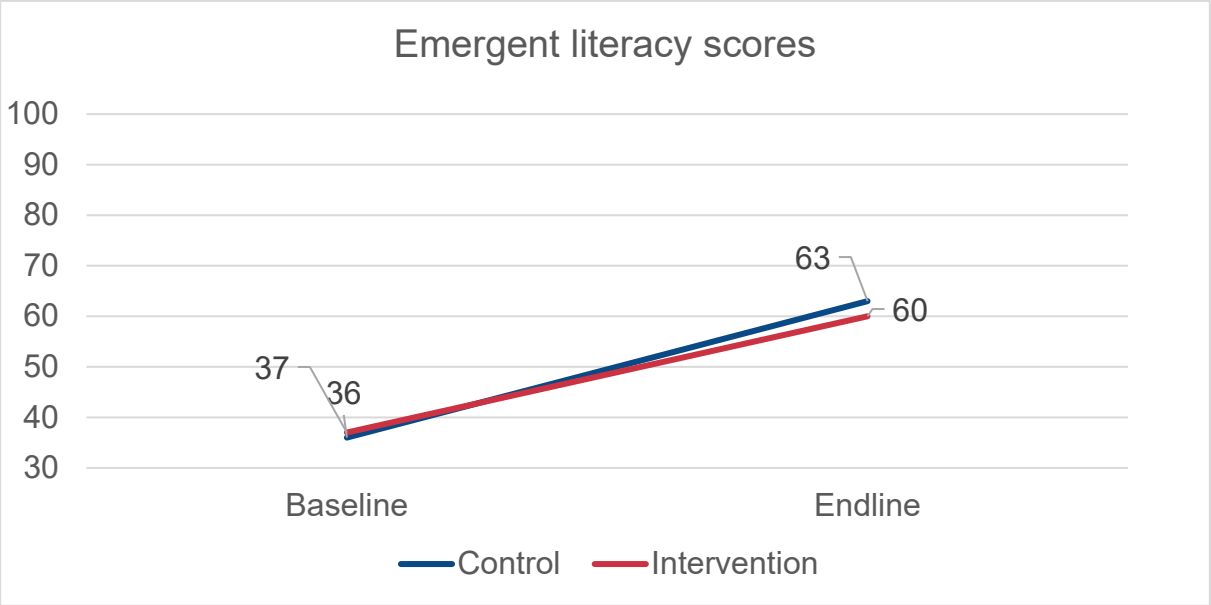

Figure 5: Median emergent literacy scores by study arm at baseline and endline in Homa Bay

Table 17: IDELA emergent literacy scores description (data is median [IQR]) – Homa Bay

	Control				Intervention			
	N	Baseline	Endline	Individual score change*	N	Baseline	Endline	Individual score change*
Overall	395	36[26,48]	63[48,74]	24[14,35]	352	37[26,50]	60[47,71]	21[12,31]
Girls	177	37[26,48]	61[49,75]	25[14,36]	185	38[27,49]	62[48,72]	21[10,31]
Boys	218	36[26,46]	63[48,73]	23[13,35]	167	37[25,51]	59[46,70]	21[12,30]
With functional difficulty	77	36[29,49]	65[52,78]	25[16,36]	69	36[25,48]	59[46,69]	22[12,31]
Without functional difficulty	317	36[26,47]	61[47,73]	23[12,35]	279	38[27,50]	61[47,72]	21[11,31]

* This value is the median of individual children's score change and does not align exactly to the difference between median baseline and endline scores.

Table 18: IDELA emergent literacy scores description (data is median [IQR]) – subset of children with functional difficulties – Homa Bay

	Control				Intervention			
	N	Baseline	Endline	Individual score change*	N	Baseline	Endline	Individual score change*
Physical, sensory, communication or self-care difficulty	30	36 [30,50]	61 [52,75]	22 [17,34]	33	31 [21,47]	52 [41,68]	21 [8,34]
Behavioural or emotional difficulty	44	36 [25,49]	72 [56,82]	29 [18,39]	42	37 [29,49]	61 [51,72]	23 [14,30]
Cognitive difficulty	27	36 [30,46]	65 [55,77]	27 [16,40]	15	27 [19,44]	51 [41,64]	21 [12,25]
Girls	31	42 [30,55]	69 [56,78]	25 [15,36]	29	32 [21,46]	60 [44,68]	23 [14,35]
Boys	46	36 [29,46]	65 [51,78]	26 [17,35]	40	39 [26,48]	59 [47,70]	21 [10,28]

* This value is the median of individual children's score change and does not align exactly to the difference between median baseline and endline scores.

Emergent literacy scores - model results

Univariate age-adjusted model results (Table 19) showed that change in emergent literacy IDELA scores was significantly lower for children from rural schools compared to peri-urban schools (estimate from age-adjusted model: -4.08 [-8.11, -0.06]).

We did not find statistically significant differences in change in IDELA across sex, functional difficulty or type of functional difficulty.

There was no significant difference in change in emergent literacy IDELA scores between control and intervention groups (β-2.90 [-7.30, 1.50]). The multivariable model results were similar (-3.03 [-6.41, 0.34]), however we note that although the change did not reach statistical significance, the upper bound of the confidence interval is very close to zero. Results from the sensitivity matching analyses (-3.61 [-6.92, -0.30]) showed a statistically

significant result, suggesting there might be a lower increase in intervention than control groups in terms of literacy scores.

Interaction tests showed no evidence of heterogeneous effects of the intervention across sex (p=1.00) or functional difficulty status (p=0.84).

Further exploratory analyses among the subset of children with functional difficulties did not reveal any significant association between change in IDELA emergent literacy scores and study arm (β=-3.76 [-10.1, 2.59] for age-adjusted intervention vs control effect; β=-2.99 [-6.39, 0.42] when controlling for all other covariates).

Table 19: Change in IDELA emergent literacy scores – age-adjusted univariate regression model results – data are estimates and associated 95% CI – Homa Bay

	Estimate [95% CI]	
Variable	Overall	Children with functional difficulties
Age	-0.17 [-1.34, 0.99]	1.12 [-0.71, 2.94]
Arm: intervention vs control	-2.90 [-7.30, 1.50]	-3.76 [-10.1, 2.59]
Sex: girls vs boys	0.58 [-2.38, 3.55]	0.39 [-5.44, 6.22]
Relative wealth: wealthier (Q3-Q5) vs poorest (Q1-Q2)	1.63 [-2.6, 5.85]	4.72 [-1.82, 11.25]
With vs without functional difficulty	1.45 [-1.48, 4.38]	-
With vs without physical/sensory etc difficulty	-1.15 [-4.76, 2.46]	-3.58 [-9.02, 1.86]
With vs without behavioural difficulty	3.67 [-0.59, 7.94]	4.66 [-1.67, 10.99]
With vs without cognitive difficulty	2.2 [-3.29, 7.68]	0.33 [-5.02, 5.67]
Cohort 2 vs Cohort 1	1.42 [-2.95, 5.79]	-3.24 [-12.14, 5.66]
Rural vs peri-urban setting	-4.08 [-8.11, -0.06]	-4.11 [-9.82, 1.59]
Household composition: not living with both parents vs living with both parents	-0.8 [-3.1, 1.49]	1.58 [-3.04, 6.2]

Emergent numeracy scores – description

As shown in Table 20 and Figure 6, the median change in IDELA emergent numeracy scores was an increase by 22 points over time in the control arm (23 point for girls, 21 points for boys) and by 23 points in the intervention arm (23 points for girls, 22 points for boys). Median increase was similar in both arms for those with functional difficulties (23 points).

Among children with functional difficulties (Table 21) no substantial differences were observed between study arms across sex or type of functional difficulty.

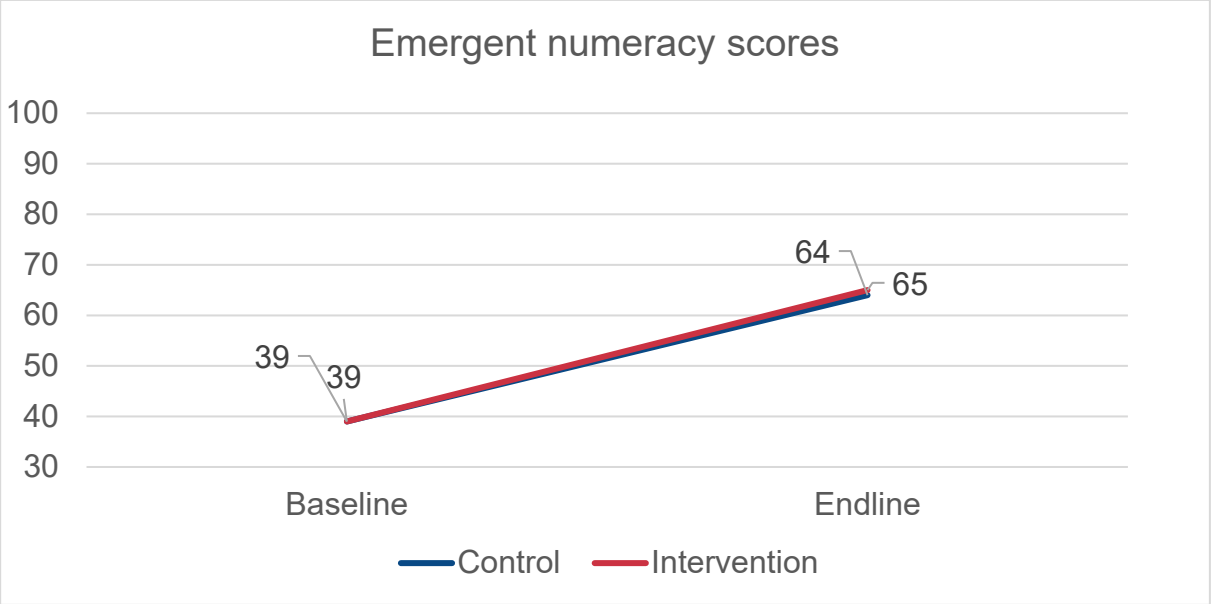

Figure 6: Median emergent numeracy scores by study arm at baseline and endline in Homa Bay

Table 20: IDELA emergent numeracy scores description (data is median [IQR]) – Homa Bay

	Control				Intervention			
	N	Baseline	Endline	Individual score change*	N	Baseline	Endline	Individual score change*
Overall	395	39[28,50]	64[50,76]	22[13,32]	352	39[27,51]	65[48,75]	23[11,33]
Girls	177	40[29,52]	66[51,77]	23[13,34]	185	37[27,49]	64[49,74]	23[10,34]
Boys	218	39[26,49]	63[49,75]	21[13,31]	167	41[28,53]	66[49,76]	22[12,33]
With functional difficulty	77	43[30,51]	65[56,75]	23[14,32]	69	40[25,52]	64[46,79]	23[12,34]
Without functional difficulty	317	39[27,50]	64[48,76]	22[12,32]	279	39[29,49]	65[49,74]	23[11,33]

* This value is the median of individual children's score change and does not align exactly to the difference between median baseline and endline scores.

Table 21: IDELA emergent numeracy scores description (data is median [IQR]) – subset of children with functional difficulties – Homa Bay

	Control				Intervention			
	N	Baseline	Endline	Individual score change*	N	Baseline	Endline	Individual score change*
Physical, sensory, communication or self-care difficulty	30	41[32,51]	65[53,77]	20[14,34]	33	40[27,51]	59[38,78]	18[5,32]
Behavioural or emotional difficulty	44	42[29,53]	67[59,77]	24[16,33]	42	42[24,52]	66[53,79]	23[18,38]
Cognitive difficulty	27	46[27,52]	66[59,73]	20[11,29]	15	38[24,48]	63[42,72]	21[11,23]
Girls	31	45[39,58]	69[60,78]	23[13,33]	29	40[20,52]	63[52,70]	21[4,40]
Boys	46	36[28,47]	64[52,69]	22[14,31]	40	42[29,52]	67[45,79]	23[15,32]

* This value is the median of individual children's score change and does not align exactly to the difference between median baseline and endline scores

Emergency numeracy scores - model results

Age-adjusted univariate model results (Table 22) showed no statistically significant differences in change in IDELA emergent numeracy scores across sex, functional difficulty status or type of functional difficulty.

There was no significant difference in change in emergent numeracy IDELA scores between control and intervention arms (β=-0.51 [-5.06, 4.03]). The multivariable model results were similar (-0.81 [-5.34, 3.72]) as were results from the sensitivity matching analyses (-2.42 [-6.35, 1.5]). Interaction tests showed no evidence of heterogeneous effects of the intervention across sex (p=0.61) or functional difficulty status (p=0.85).

Further exploratory analyses among the subset of children with functional difficulties (Table 22) did not reveal any significant association between change in IDELA and study arm. (Age-adjusted β=-0.58 [-9.67, 8.52] and β=-0.78 [-5.19, 3.63] when controlling for all other covariates).

Table 22: Change in IDELA emergent numeracy scores – age-adjusted univariate regression model results – data are estimates and associated 95% CI – Homa Bay

	Estimate [95% CI]	
Variable	Overall	Children with functional difficulties
Age	-0.88 [-2, 0.24]	-0.6 [-2.46, 1.26]
Arm: intervention vs control	-0.51 [-5.06, 4.03]	-0.23 [-9.02, 8.55]
Sex: girls vs boys	0.28 [-2.02, 2.57]	-1.48 [-8.74, 5.78]
Relative wealth: wealthier (Q3-Q5) vs poorest (Q1-Q2)	2.81 [-1.41, 7.02]	4.72 [-0.8, 10.23]
With vs without functional difficulty	0.62 [-3.04, 4.28]	-
With vs without physical/sensory etc difficulty	-2.62 [-8.45, 3.22]	-5.09 [-11.59, 1.4]
With vs without behavioural difficulty	3.36 [-2.06, 8.78]	5.85 [-1.9, 13.59]
With vs without cognitive difficulty	-1.07 [-5, 2.86]	-2.5 [-7.78, 2.79]
Cohort 2 vs Cohort 1	1.08 [-2.74, 4.9]	-2.27 [-11.25, 6.72]
Rural vs peri-urban setting	0.28 [-3.93, 4.49]	-0.82 [-9.55, 7.92]

	Estimate [95% CI]	
Household composition: not living with both parents vs living with both parents	-1.86 [-3.78, 0.05]	-3.72 [-9.48, 2.03]

Kakuma

Total scores - description

As shown in Table 23 and Figure 7, IDELA total scores increased by a median of 22 points over time in the control arm (23 points for girls, 21 points for boys) and also by a median of 22 points in the intervention arm (23 points for girls, 21 for boys). Median changes were slightly lower among those with functional difficulty (increase by 18 points) compared to those without (increase by 22 points) in both study arms.

The number of children with functional difficulties was too small (N=33) to justify further disaggregation within this group.

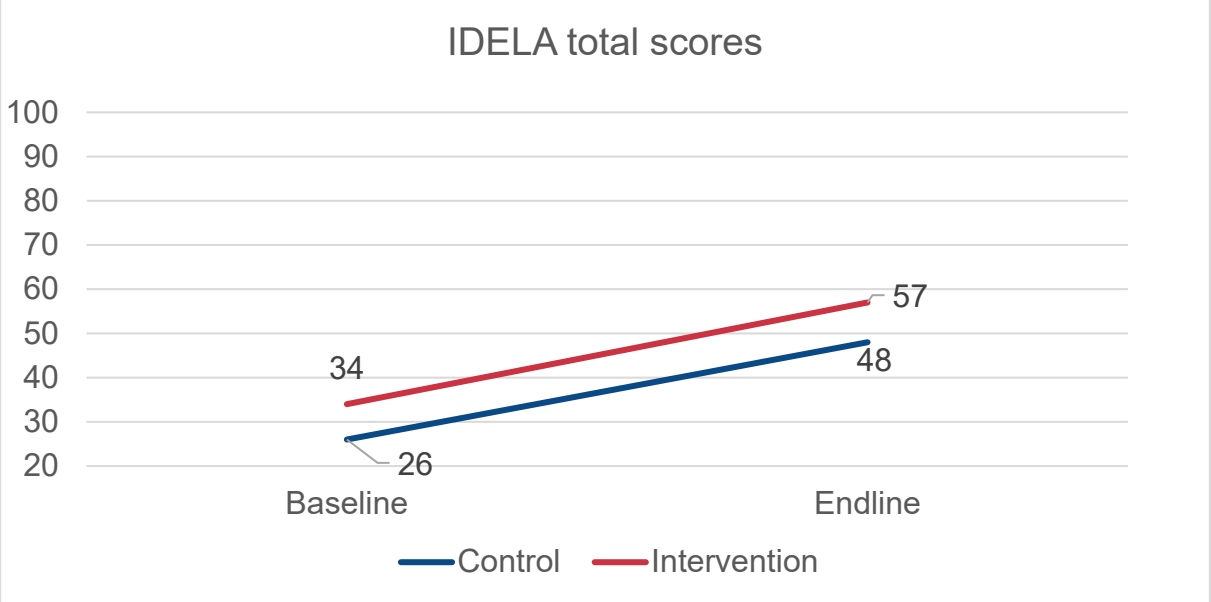

Figure 7: Median IDELA total scores by study arm at baseline and endline in Kakuma

Table 23: IDELA total scores description – data is median [IQR] – Kakuma

	Control				Intervention			
	N	Baseline	Endline	Individual score change*	N	Baseline	Endline	Individual score change*
Overall	174	26[15,35]	48[37,59]	22[10,34]	199	34[23,45]	57[47,67]	22[12,33]
Girls	88	23[13,35]	46[36,58]	23[10,34]	97	32[20,42]	56[48,66]	23[14,33]
Boys	86	27[19,38]	53[39,61]	21[10,33]	102	35[25,46]	57[46,68]	21[10,33]
With functional difficulty	12	32[24,39]	59[42,65]	18[10,32]	21	35[26,46]	55[47,64]	18[10,27]
Without functional difficulty	162	26[14,35]	48[37,58]	22[10,34]	177	33[23,45]	57[47,67]	22[12,34]

* This value is the median of individual children's score change and does not align exactly to the difference between median baseline and endline scores

Total scores - model results

Univariate model results showed that change in IDELA was on average lower for older children and for children who did not live with both their parents, compared to those who did (Table 24). We did not find any statistically significant differences in IDELA change across sex or functional difficulty status.

There was no significant difference in change in total IDELA scores between control and intervention groups. Results remained similar when controlling for all the other covariates with the difference-in-difference estimate between intervention and control being 1.79 [-2.48, 6.06]. Results from the sensitivity matching analyses also supported these conclusions, with the estimated effect for intervention vs control being 0.81 [-3.82, 5.43].

Interaction tests showed no evidence of heterogeneous effects of the intervention across functional difficulty status (p=0.53) nor sex (p=0.21), meaning there was no evidence that the effect of intervention differed across functional difficulty status or sex.

The number of children with functional difficulties was too small to conduct modelling within this subset.

Table 24: Change in IDELA scores – age-adjusted univariate regression model results – data are estimates and associated 95% CI - Kakuma

Variable	Estimate [95% CI]	
	Overall	Children with functional difficulties
Age	1.44 [-1.99, -0.9]	-
Arm: intervention vs control	1.90 [-2.63, 6.42]	-
Sex: girls vs boys	1.78 [-2.86, 6.41]	-
Relative wealth: wealthier (Q3-Q5) vs poorest (Q1-Q2)	0.46 [-2.68, 3.61]	-
With vs without functional difficulty	0.90 [-8.81, 10.61]	-
With vs without physical/sensory etc difficulty	0.48 [-14.5, 15.45]	-
With vs without behavioural difficulty	2.16 [-8.36, 12.67]	-
With vs without cognitive difficulty	4.17 [-20.39, 28.74]	-
Cohort 2 vs Cohort 1	-0.07 [-8.36, 8.23]	-
Household composition: not living with both parents vs living with both parents	-2.61 [-4.43, -0.78]	

Motor scores - description

As shown in Table 25 and Figure 8, IDELA motor scores increased by a median of 31 points over time in the control arm (32 points for girls, 31 points for boys) and by 29 points in the intervention arm (30 points for girls, 25 for boys).

Median increases were higher in the control arm for those with functional difficulty (37 points versus 19 points in the intervention arm). Results must be interpreted with caution at this level of disaggregation due to the small sample size.

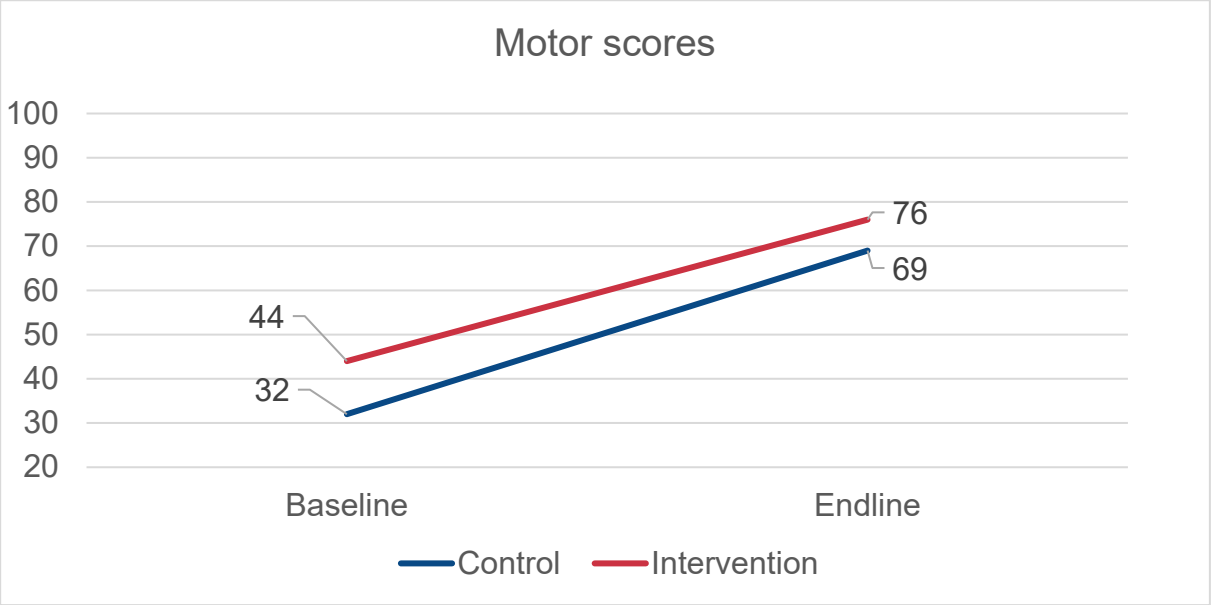

Figure 8: Median motor scores by study arm at baseline and endline in Kakuma

Table 25: IDELA motor scores description (data is median [IQR]) – Kakuma

	Control				Intervention			
	N	Baseline	Endline	Individual score change*	N	Baseline	Endline	Individual score change*
Overall	174	32[12,51]	69[45,81]	31[12,47]	199	44[25,66]	76[62,88]	29[8,44]
Girls	88	32[5,52]	69[43,81]	32[8,51]	97	44[25,62]	75[59,88]	30[9,44]
Boys	86	32[19,50]	69[48,81]	31[16,45]	102	40[25,69]	78[62,88]	25[7,45]
With functional difficulty	12	48[28,55]	81[55,95]	37[16,54]	21	53[44,75]	81[64,88]	19[9,28]
Without functional difficulty	162	32[12,50]; N=162	69[44,81]; N=162	31[12,46]; N=162	177	41[25,65]; N=177	76[62,88]; N=177	31[8,45]; N=177

* This value is the median of individual children's score change and does not align exactly to the difference between median baseline and endline scores

Motor scores - model results

Univariate model results (Table 26) showed that change in IDELA motor scores decreased with age. Adjusting for age, we did not find statistically significant differences in change in IDELA across sex, functional difficulty status or two of the three types of functional difficulty: physical/sensory/communication and cognitive. However, the change in motor scores was significantly higher among those with behavioural difficulties than those without behavioural difficulties (13.12 [3.06, 23.18]).

There was no significant difference in change in motor IDELA scores between control and intervention groups (-1.06 [-4.66, 2.54]). The multivariable model results were similar (-1.6 [-5.84, 2.64]). Results from the sensitivity matching analyses drew the same conclusions (-2.81 [-10.62, 5.01]). Interaction tests showed no evidence of heterogeneous effects of the intervention across sex (p=0.47) or functional difficulty status (0.32).

Table 26: Change in IDELA motor scores – age-adjusted univariate regression model results – data are estimates and associated 95% CI – Kakuma

Variable	Overall	Children with functional difficulties
Age	-4.3 [-6.39, -2.2]	-
Arm: intervention vs control	-1.06 [-4.66, 2.54]	-
Sex: girls vs boys	1.89 [-2.71, 6.49]	-
Relative wealth: wealthier (Q3-Q5) vs poorest (Q1-Q2)	0.38 [-8.59, 9.34]	-
With vs without functional difficulty	5 [-10.39, 20.4]	-
With vs without physical/sensory etc difficulty	0.07 [-17.52, 17.66]	-
With vs without behavioural difficulty	13.12 [3.06, 23.18]	-
With vs without cognitive difficulty	14.85 [-50.33, 80.02]	-
Cohort 2 vs Cohort 1	-1.33 [-17.02, 14.36]	-
Household composition: not living with both parents vs living with both parents	-6.89 [-14.82, 1.05]	-

Socio-emotional scores - description

As shown in Table 27 and Figure 9, the median change in IDELA socio-emotional scores was an increase by 21 points over time in the control arm (20 points for girls, 23 points for boys) and also by a median of 21 points in the intervention arm (23 points for girls, 16 for boys).

Median changes were higher among those with functional difficulty in the control arm (increase by 21 points) compared to the intervention arm (increase by 14 points). These results need to be interpreted with caution due to the small sample size.

The number of children with functional difficulties was too small (N=33) to justify further disaggregation within this group.

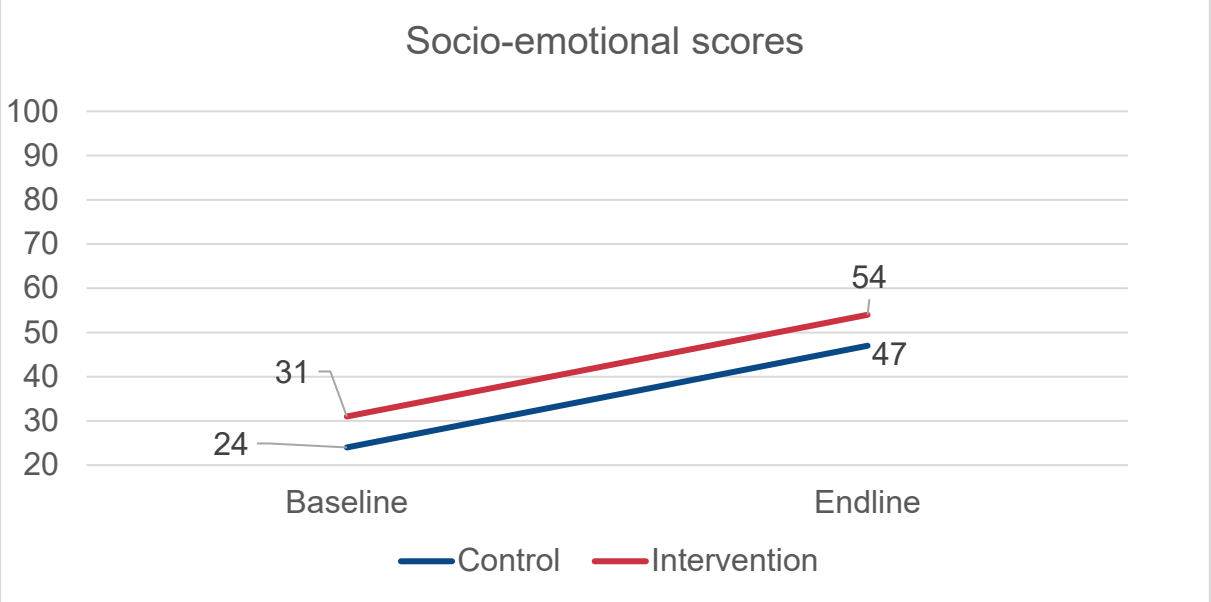

Figure 9: Median socio-emotional scores by study arm at baseline and endline in Kakuma

Table 27: IDELA socio-emotional scores description – data is median [IQR] – Kakuma

Variable	Control				Intervention			
	N	Baseline	Endline	Individual score change*	N	Baseline	Endline	Individual score change*
Overall	174	24[15,35]	47[30,61]	21[9,34]	199	31[21,45]	54[38,69]	21[4,35]
Girls	88	22[13,33]	42[28,56]	20[9,33]	97	28[19,41]	56[39,68]	23[9,38]
Boys	86	26[17,37]	54[32,67]	23[8,40]	102	35[23,48]	52[36,70]	16[0,32]
With functional difficulty	12	29[22,35]	52[39,64]	26[18,31]	21	29[17,40]	48[35,66]	14[5,29]
Without functional difficulty	162	24[15,35]	46[29,60]	20[6,34]	177	32[22,46]	54[39,70]	21[4,35]

* This value is the median of individual children's score change and does not align exactly to the difference between median baseline and endline scores

Socio-emotional scores - model results

We did not find any statistically significant patterns of association between IDELA scores and any of the covariates of interest (Table 28). More specifically, there was no significant difference in the change in IDELA socio-emotional scores between control and intervention arm (0.12 [-6.21, 6.46]). The multivariable model results were similar (0.25 [-4.47, 4.96]). Results from the sensitivity matching analyses also supported these conclusions, with the estimated effect for intervention vs control being -0.29 [-5.79, 5.21].

Interaction tests showed no evidence of heterogeneous effects of the intervention across functional difficulty status (p=0.60) nor sex (p=0.17), meaning there was no evidence that the effect of intervention differed across functional difficulty status nor sex.

The number of children with functional difficulties was too small to conduct modelling within this subset.

Table 28: Change in IDELA socio-emotional scores – age-adjusted univariate regression model results – data are estimates and associated 95% CI – Kakuma

Variable	Overall	Children with functional difficulties
Age	-0.87 [-3.1, 1.36]	-
Arm: intervention vs control	0.12 [-6.21, 6.46]	-
Sex: girls vs boys	1.45 [-8.29, 11.20]	-
Relative wealth: wealthier (Q3-Q5) vs poorest (Q1-Q2)	-0.48 [-11.22, 10.27]	-
With vs without functional difficulty	1.53 [-8.98, 12.05]	-
With vs without physical/sensory etc difficulty	2.53 [-14.06, 19.13]	-
With vs without behavioural difficulty	0.56 [-17.05, 18.17]	-
With vs without cognitive difficulty	7.96 [-36.86, 52.78]	-
Cohort 2 vs Cohort 1	-3.87 [-15.69, 7.95]	-
Household composition: not living with both parents vs living with both parents	-0.03 [-1.79, 1.73]	

Emergent literacy scores - description

As shown in Table 29 and Figure 10, the median change in IDELA emergent literacy scores was an increase by 17 points over time in the control arm (20 point for girls, 14 points for boys) and by 22 points in the intervention arm (23 points for girls, 21 points for boys). Median increase was higher in the intervention arm for those with functional difficulties (24 points in the intervention arm, 16 points in the control arm). Results should be interpreted with caution given the small number of children with functional difficulties in each study arm.

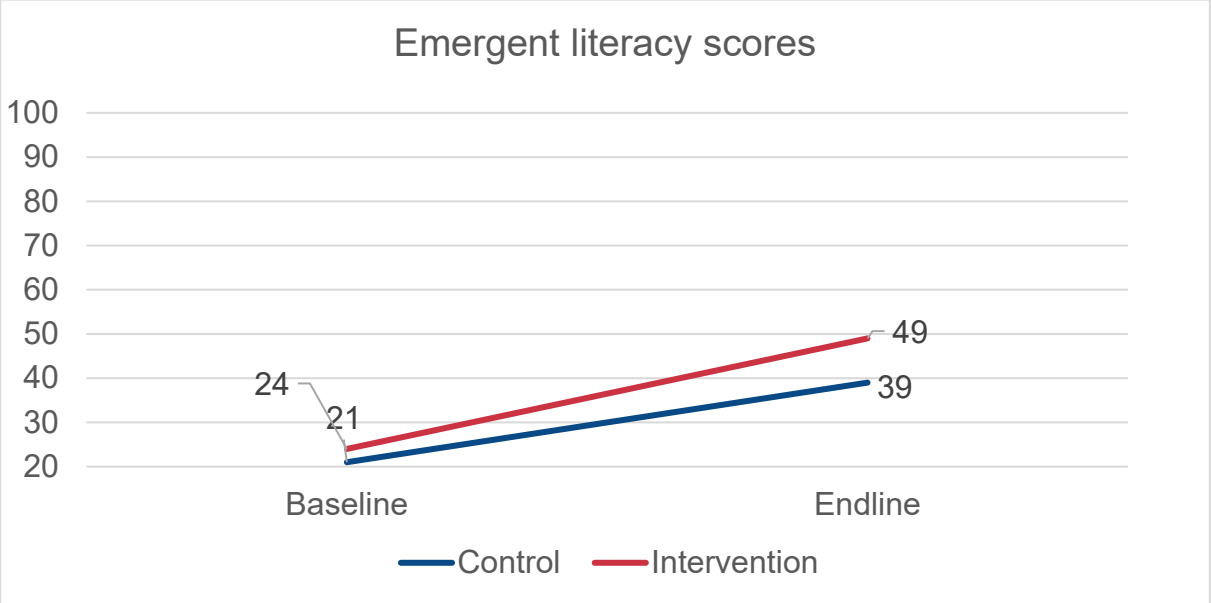

Figure 10: Median emergent literacy scores by study arm at baseline and endline in Kakuma

Table 29: IDELA emergent literacy scores description (data is median [IQR]) – Kakuma

	Control				Intervention			
	N	Baseline	Endline	Individual score change*	N	Baseline	Endline	Individual score change*
Overall	174	21[6,31]	39[27,52]	17[7,31]	199	24[14,38]	49[35,59]	22[8,36]
Girls	88	19[5,28]	37[26,48]	20[10,30]	97	22[11,38]	48[35,59]	23[7,36]
Boys	86	23[6,37]	43[31,54]	14[6,33]	102	26[16,38]	52[36,60]	21[10,36]
With functional difficulty	12	29[26,40]	44[38,54]	16[8,23]	21	22[17,38]	49[36,59]	24[11,35]
Without functional difficulty	162	20[6,31]	39[27,52]	18[7,32]	177	25[14,38]	49[35,60]	21[8,36]

* This value is the median of individual children's score change and does not align exactly to the difference between median baseline and endline scores

Emergent literacy scores - model results

We did not find statistically significant differences in change in IDELA emergent literacy scores across sex, functional difficulty status or type of functional difficulty (Table 30).

There was no significant difference in change in IDELA emergent literacy scores between control and intervention groups (4.86 [-5.43, 15.15]). The multivariable model results were similar (5.14 [-5.26, 15.54]). Results from the sensitivity matching analyses 3.89 [-1.83, 9.61] were similar.

Interaction tests showed no evidence of heterogeneous effects of the intervention across sex (p=0.80) or across functional difficulty status (p=0.92).

Table 30: Change in IDELA emergent literacy scores – age-adjusted univariate regression model results – data are estimates and associated 95% CI – Kakuma

Variable	Overall	Children with functional difficulties
Age	-1.2 [-3.7, 1.29]	-
Arm: intervention vs control	4.86 [-5.43, 15.15]	-
Sex: girls vs boys	0.24 [-2.86, 3.35]	-
Relative wealth: wealthier (Q3-Q5) vs poorest (Q1-Q2)	-2.86 [-10.73, 5.01]	-
With vs without functional difficulty	0.17 [-12.23, 12.57]	-
With vs without physical/sensory etc difficulty	-0.19 [-22.93, 22.56]	-
With vs without behavioural difficulty	-0.04 [-15.55, 15.48]	-
With vs without cognitive difficulty	3.13 [-27.17, 33.43]	-
Cohort 2 vs Cohort 1	1.79 [-4.62, 8.21]	-
Household composition: not living with both parents vs living with both parents	-4.63 [-9.53, 0.27]	

Emergent numeracy scores - description

As shown in Table 31 and Figure 11, the median change in IDELA emergent numeracy scores was an increase by 16 points over time in the control arm (18 point for girls, 13 points for boys) and by 21 points in the intervention arm (22 points for girls, 19 points for boys). Median increase was higher in the intervention arm for those with functional difficulties (18 points in the intervention arm, 9 points in the control arm). Results should be interpreted with caution given the small number of children with functional difficulties in each study arm.

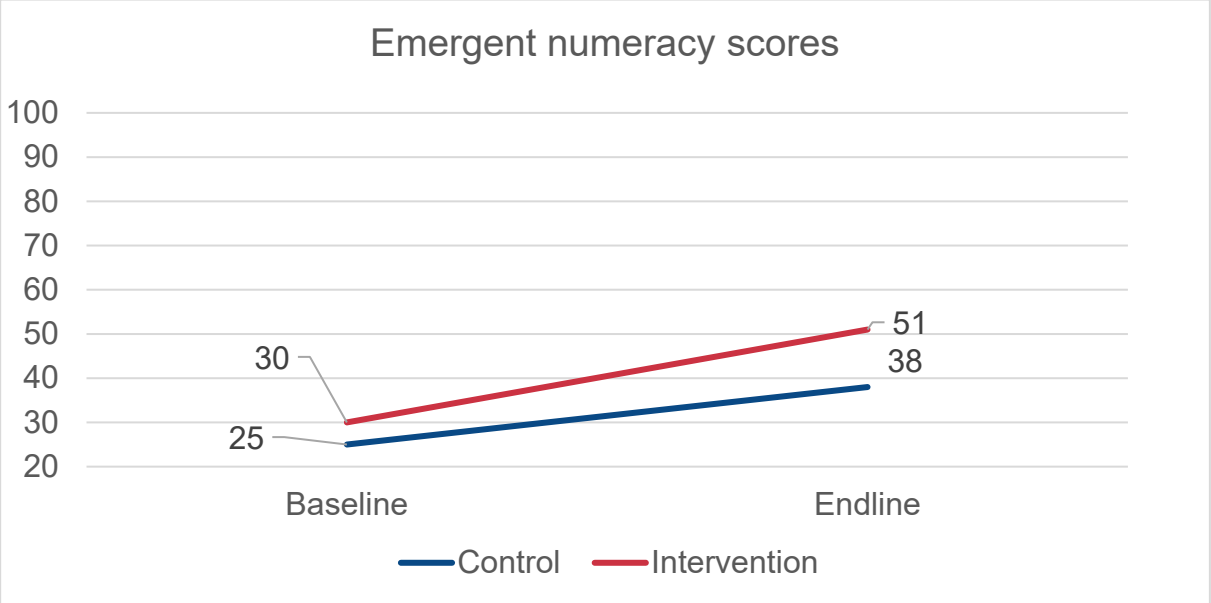

Figure 11: Median emergent numeracy scores by study arm at baseline and endline in Kakuma

Table 31: IDELA emergent numeracy scores description (data is median [IQR]) – Kakuma

	Control				Intervention			
	N	Baseline	Endline	Individual score change*	N	Baseline	Endline	Individual score change*)
Overall	174	25[14,34]	38[28,53]	16[3,28]	199	30[19,41]	51[37,63]	21[4,37]
Girls	88	22[12,33]	37[29,53]	18[7,29]	97	26[17,38]	51[37,63]	22[8,39]
Boys	86	27[16,35]	41[28,56]	13[1,23]	102	34[21,44]	51[36,65]	19[2,32]
With functional difficulty	12	29[22,34]	40[34,63]	9[0,35]	21	34[20,42]	46[37,62]	18[3,27]
Without functional difficulty	162	24[14,34]	38[28,52]	16[3,27]	177	29[20,40]	52[37,64]	21[4,38]

* This value is the median of individual children's score change and does not align exactly to the difference between median baseline and endline scores.

Emergent numeracy scores - model results

Univariate age-adjusted model results (Table 32) showed no evidence of statistically significant patterns of association between the change in IDELA emergent numeracy scores and any of the covariates of interest.

There was no significant difference in change in total IDELA scores between control and intervention arms (3.67 [-1.71, 9.05]). The multivariable model results were similar (3.40 [-1.13, 7.92]). Results from the sensitivity matching analyses (2.17 [-4.29, 8.63]) showed similar results.

Interaction tests showed no evidence of heterogeneous effects of the intervention across sex (p=0.24) nor across functional difficulty status (p=0.64).

Table 32: Change in IDELA emergent numeracy scores – age-adjusted univariate regression model results – data are estimates and associated 95% CI – Kakuma

Variable	Overall	Children with functional difficulties
Age	0.61 [-0.39, 1.6]	-
Arm: intervention vs control	3.67 [-1.71, 9.05]	-
Sex: girls vs boys	3.51 [-1.36, 8.39]	-
Relative wealth: wealthier (Q3-Q5) vs poorest (Q1-Q2)	4.81 [-7.97, 17.58]	-
With vs without functional difficulty	-3.12 [-15.06, 8.82]	-
With vs without physical/sensory etc difficulty	-0.51 [-24.1, 23.08]	-
With vs without behavioural difficulty	-5.03 [-20.47, 10.42]	-
With vs without cognitive difficulty	-9.25 [-52.59, 34.1]	-
Cohort 2 vs Cohort 1	3.14 [-4.85, 11.13]	-
Household composition: not living with both parents vs living with both parents	1.11 [-2.48, 4.70]	

3.4 Education data

It is important to emphasise that given the patterns in record-keeping/data availability as well as the heterogenous nature of the data (heterogeneity in recording across teachers and across time) – compounded with the small proportion of children having outcomes for both baseline and endline – the interpretation of results on education data is unclear and any conclusions should be treated with caution.

Homa Bay

Attendance data

Among intervention schools in Homa Bay, attendance data was available on average for 72% of children at baseline and for 93% of children at endline. In control schools, attendance data was available on average for 64% of children at baseline and 75% at endline.

Description of rates

Conditional on attendance data being available, in Homa Bay median attendance rates (number of days attended out of potential attendance days in a term) in intervention schools increased from 86% to 89% (86% to 91% among boys and 86% to 88% among girls). Median attendance rates in control schools decreased slightly, from 94% at baseline to 93% at endline (remained at 92% for boys, decreased from 96% to 93% among girls).

Among children with functional difficulties, median attendance rates increased from 88% at baseline to 91% at endline, remaining at 90% for boys and improving from 88 to 92% among girls.

Improvement in rates

Description by arm overall and by sex

Among children with attendance data available at both baseline and endline (N=469), 42.5% of children in control schools had an improvement in attendance rates or remained at full attendance rates, versus 50% in intervention schools. This difference was not statistically significant (padj=0.60).

Among boys (N=237), 42.4% of children in control schools had an improvement in attendance rates or remained at full attendance rates, versus 55.2% in intervention schools. This difference was not statistically significant (padj=0.30).

Among girls (N=232), 42.6% of children in control schools had an improvement in attendance rates or remained at full attendance rates, versus 45.8% in intervention schools. This difference was not statistically significant (padj=1.00).

Description among the children with functional difficulties

Among those with functional difficulties (N=88), 39.0% of children in control schools had an improvement in attendance rates or remained at full attendance rates versus 63.8% in intervention schools. This difference was not statistically significant (padj=0.21).

Among boys with functional difficulties (N=54), 46.4% of children in control schools had an improvement in attendance rates or remained at full attendance rates, versus 69.2% in intervention school. This difference was not statistically significant (padj=0.96).

Among girls (N=34), 23.1% of children in control schools had an improvement in attendance rates or remained at full attendance rates versus 57.1% in intervention schools. This difference was not statistically significant (padj=0.67).

Model results

Results of univariate models are given in Table 33. Univariate models showed no significant association between study arm and improvement in attendance rates (or constant full rates), both overall (OR=1.37 [0.67, 2.81]) and among those with functional difficulties (OR=2.76 [0.87, 8.79]).

Multivariable model results controlling for age, sex, wealth, disability status, cohort and household composition also showed no statistically significant difference in improvement in rates between intervention and control arm overall (OR=1.41; 95% CI= [0.63, 3.16]), and for children with functional difficulties (OR=3.18 [0.96, 10.5]). However, the lower confidence interval bound being very close to 1 suggest children with functional difficulties in intervention schools might be more likely to experience improvement in attendance rates, or to remain at full attendance rates, than those in control schools.

Table 33: Improvement in attendance rates – univariate logistic regression model results – data are odds-ratios and associated 95% CI – Homa Bay

Variable	Overall	Children with functional difficulties
Age	1.10 [0.9, 1.34]	1.11 [0.57, 2.17]
Arm: intervention vs control	1.37 [0.67, 2.81]	2.76 [0.87, 8.79]
Sex: girls vs boys	0.87 [0.56, 1.34]	0.59 [0.25, 1.38]
Relative wealth: wealthier (Q3-Q5) vs poorest (Q1-Q2)	0.60 [0.42, 0.86]	0.69 [0.18, 2.75]
With vs without functional difficulty	1.36 [0.76, 2.41]	-
Cohort 2 vs Cohort 1	0.69 [0.28, 1.69]	0.22 [0.06, 0.87]
Household composition: not living with both parents vs living with both parents	1.08 [0.61, 1.92]	0.79 [0.30, 2.05]
Rural vs peri-urban setting	1.10 [0.47, 2.61]	1.68 [0.40, 7.13]

Academic outcomes

Academic outcomes data was collected using the Competency-Based Curriculum (CBC) grading. Among intervention schools in Homa Bay, academic outcomes data was available on average for 81% of children at baseline and for 91% of children at endline. In control schools, academic outcomes data was available on average for 74% of children at baseline and 92% at endline.

Description of academic outcomes

Conditional on academic outcomes data being available, in Homa Bay the proportion of children who met or exceeded expectations in at least one subject in intervention schools increased from 88% (N=246) to 96% (N=307) (83% to 94% among boys and 92% to 98% among girls). The proportion of children who met or exceeded expectations in at least one subject in control schools increased from 84% (N=242) to 92% (N=334) (79% to 87% for boys, 92% to 98% among girls).

Academic performance

Description by arm overall and by sex

Among children with academic outcomes available at both baseline and endline (N=536), 94.6% met or exceeded learning expectations in at least one subject in control schools versus 96.1% in intervention schools. This difference was not statistically significant (padj=1.00).

Among boys (N=278), 91.9% met or exceeded learning expectations in at least one subject in control schools versus 94.1% in intervention schools. This difference was not statistically significant (padj=1.00).

Among girls (N=258), 98.3% met or exceeded learning expectations in at least one subject in control schools versus 97.8% in intervention schools. This difference was not statistically significant (padj=1.00).

Description among children with functional difficulties

Among children with functional difficulty (N=80), 91.9% performed academically in control schools versus 97.7% in intervention schools. This difference was not statistically significant (padj=1.00).

Among boys (N=50), 88.9% performed academically in control schools versus 95.7% in intervention schools. This difference was not statistically significant (padj=1.00).

Among girls (N=30), 100% performed academically in both control and intervention schools.

Model results

Results of univariate models are given in Table 34. Univariate models showed no significant association between study arm and academic performance, both overall (OR=1.40 [0.29, 6.65]) and among those with functional difficulties (OR=3.71 [0.21, 65.17]). The large confidence intervals are an indication of high uncertainty around the results.

Multivariable model results controlling for age, sex, wealth, disability status, rural/peri-urban location, cohort and household composition showed no statistically significant difference in academic performance, between intervention and control arm (OR=1.09; 95% CI= [0.21, 5.79]).

Table 34: Academic performance – univariate logistic regression model results – data are odds-ratios and associated 95% CI – Homa Bay

Variable	Overall	Children with functional difficulties
Age	0.88 [0.58, 1.36]	1.29 [0.33, 5.1]
Arm: intervention vs control	1.40 [0.29, 6.65]	3.71 [0.21, 65.17]
Sex: girls vs boys	3.97 [1.18, 13.3]	NA (failed to converge)
Relative wealth: wealthier (Q3-Q5) vs poorest (Q1-Q2)	1.43 [0.82, 2.49]	3.51 [0.2, 62.41]
With vs without functional difficulty	0.92 [0.3, 2.88]	-
Cohort 2 vs Cohort 1	0.47 [0.14, 1.59]	0.69 [0.06, 8.19]
Household composition: not living with both parents vs living with both parents	0.98 [0.38, 2.5]	0.46 [0.04, 5.68]
Rural vs peri-urban setting	0.74 [0.16, 3.45]	2.56 [0.14, 46.48]

Kakuma

Attendance data

In intervention schools in Kakuma, attendance data was available on average for 67% of children at baseline and for 72% of children at endline. In control schools, attendance data was available on average for 56% of children at baseline and 60% at endline.

Description of rates

Conditional on attendance data being available, median attendance rates in intervention schools increased from 73% (N=134) to 75% (N=143) (73% to 75% among boys, and 72% to 75% among girls). Median attendance rates in control schools decreased slightly from 67% (N=98) to 66% (N=100) (68% to 67% for boys, 67% to 64% among girls).

Improvement in rates

Description by arm overall and by sex

Among children with attendance data available at both baseline and endline (N=150), 27.1% of children in control schools had an improvement in attendance rates or remained at full

attendance rates versus 52.7% in intervention schools. This proportion was significantly higher in intervention schools (padj=0.01).

Among boys (N=74), 19.2% of children in control schools had an improvement in attendance rates or remained at full attendance rates versus 41.7% in intervention schools. This difference was not statistically significant (padj=0.27).

Among girls (N=76), 33.3% of children in control schools had an improvement in attendance rates or remained at full attendance rates versus 65.1% in intervention schools. This proportion was significantly higher in intervention schools (padj=0.04).

Description among the children with functional difficulties

There were only ten children with functional difficulties among those who had attendance data available at both baseline and endline. This sample size was too small for further disaggregation or modelling.

Model results

Results of univariate models are given in Table 35. Univariate models showed no significant association between study arm and improvement in attendance rates or remaining at full rates for all children (OR=3.00 [0.31, 29.06]).

Multivariable model results controlling for age, sex, wealth, disability status, rural/peri-urban location, cohort and household composition also showed no statistically significant difference overall in improvement in rates or remaining at full rates between intervention and control arm (OR=3.30 [0.51, 21.48]).

Modelling was not conducted on the subset of children with functional difficulties due to small sample size.

Table 35: Improvement in attendance rates –univariate logistic regression model results – data are odds-ratios and associated 95% CI – Kakuma

Variable	Overall	Children with functional difficulties
Age	0.86 [0.66, 1.11]	-
Arm: intervention vs control	3.00 [0.31, 29.06]	-
Sex: girls vs boys	2.07 [1.04, 4.10]	-
Relative wealth: wealthier (Q3-Q5) vs poorest (Q1-Q2)	2.88 [0.33, 25.09]	-
With vs without functional difficulty	0.56 [0.04, 7.3]	-
Cohort 2 vs Cohort 1	0.71 [0.06, 8.78]	-
Household composition: not living with both parents vs living with both parents	0.54 [0.16, 1.82]	-

Academic outcomes

Among intervention schools in Kakuma, academic outcomes data was available on average for 83% of children at baseline and for 67% of children at endline. In control schools, academic outcomes data was available on average for 66% of children at baseline and 71% at endline.

Description of academic outcomes

Conditional on academic outcome data being available, the proportion of children who met or exceeded expectations in at least one subject in intervention schools increased from 80% (N=131) to 100% (N=134) (77% to 100% among boys and 83% to 100% among girls). The proportion of children who met or exceeded expectations in at least one subject in control schools increased from 72% (N=83) to 92% (N=112) (78 % to 86% for boys, 67% to 97% among girls).

Academic performance

Description by arm overall and by sex

Among children with academic data available at both baseline and endline (N=197), 88.9% performed academically in control schools versus 100% in intervention schools. This difference was statistically significant (padj<0.01).

Among boys (N=92), 81% performed academically in control schools versus 100% in intervention schools. This difference was statistically significant (padj<0.01).

Among girls (N=105), 95.8% performed academically in control schools versus 100% in intervention schools. This difference was not statistically significant (padj=0.62).

Description among children with functional difficulties

Among children with academic performance data at baseline and endline, there were only 18 children with functional difficulties, all of whom performed academically.

Model results

Models exploring the association between academic performance and study arm failed to converge due to quasi-separation of the data (all children from the intervention group performed academically).

Due to the small sample size, no modelling was conducted among the subset of children with functional difficulties.

4 Discussion

This is one of a small number of studies which have examined the relationship between early childhood development, education and disability in young children of pre-school age in sub-Saharan Africa. According to our knowledge, this is the first study to use the IDELA tool to measure developmental and learning outcomes for a specific sample of children with disabilities in sub-Saharan Africa, and the first to do this in a humanitarian setting.

4.1 Summary of the study and results

The aim of the study was to generate new evidence on early development and education of children with disabilities attending mainstream pre-primary schools in Kenya, and to assess the impact of disability-inclusive education practices on the developmental and learning outcomes of children with and without disabilities in this context.

The project was implemented in two distinct locations: rural and peri-urban areas of Homa Bay county in western Kenya (Homa Bay study site), and the area hosting Kakuma refugee camp in Turkana county, north-western Kenya (Kakuma study site).

In this study, we aimed to generate several pieces of evidence previously lacking or limited in the inclusive ECDE discourse, namely:

- Prevalence and type of disability among young children attending mainstream public pre-schools.
- Similarities and differences in the developmental and early learning outcomes of children with and without disabilities, as measured by the IDELA tool.
- Impact of inclusive education interventions on the development and early learning of children with and without disabilities.

Participant characteristics and attrition

In this study, children's disability status was determined by applying recommended cut-offs to caregivers' responses to the UNICEF/Washington Group Child Functioning Module (CFM). Of 523 children enrolled into the study in intervention schools in Homa Bay, 106 (20.5%) were found to have a functional difficulty. In intervention schools in Kakuma, prevalence of functional difficulty was lower, but still substantial: out of 344 children enrolled into the study, 35 (10.2%) had a functional difficulty.

We used control schools in the study, which were similar to the intervention schools in size, but did not have project-supported interventions. Control schools delivered "business as usual" ECDE activities and are used as a counterfactual, i.e. they showed what would have happened in intervention schools without project-supported interventions. A study design

using intervention and control sites substantially strengthens an impact evaluation, as it allows measurement of the net effect of a particular intervention.

In the study's control schools in Homa Bay, 551 children were enrolled in the study, and 106 of them (19.3%) had a functional difficulty. In control schools in Kakuma, 330 children were enrolled in the study, and 24 of them (7.3%) had a functional difficulty.

One of the key challenges we encountered in this study was a high level of attrition between the baseline and endline measurement points. In Homa Bay intervention schools, 171 children, including 37 with functional difficulties, could not be assessed at endline. According to school records, the majority of these children (over 83%) had left the school altogether. Patterns of attrition in control schools were similar.

In Kakuma intervention schools, 95 children, including 14 children with functional difficulties, could not be found at endline. The reasons for the attrition were different than in Homa Bay: about a third of children who could not be found had left the school altogether, another third was still enrolled but were absent during the whole endline assessment data collection period, and around 18% could not be identified as the teacher could not recognise their names. Patterns of attrition in control schools in Kakuma were similar. As the impact evaluation analysis could only include children with IDELA assessments at both baseline and endline, these high levels of attrition meant that the number of children who could be included in the impact evaluation analysis was smaller than anticipated.

IDELA scores and impact evaluation

At baseline (the start of PP1), the median overall IDELA score for all children in intervention schools in Homa Bay was 48 (49 for girls and 47 for boys). We did not find any difference in the baseline scores of children with and without functional difficulties (49 and 48 respectively). In Kakuma intervention schools, the overall median baseline score was lower than in Homa Bay, at 34 (32 for girls and 35 for boys). As in Homa Bay, scores were similar for children with and without functional difficulty (35 and 33 respectively). Results for specific IDELA domains were broadly similar to the overall scores.

At endline (towards the end of PP2, five academic terms later), IDELA scores had increased for all groups of participants. In Homa Bay intervention schools, the median sample score had increased from 48 to 68 (from 49 to 68 for girls, and 47 to 68 for boys). The median change in children's individual scores was 19 (20 for girls and 18 for boys). The scores of children in the Homa Bay control schools also increased in a similar way. Among this group, the median overall IDELA score increased from 48 to 70 (from 49 to 71 for girls and from 47 to 71 for boys). The median change in children's individual scores was 20 (20 for girls and 21 for boys). Median changes in children's individual scores in specific IDELA domains were similar: 17 points in motor development in intervention schools (19 in control), 16 points in socio-emotional (13 in control), 21 points in early literacy (24 in control) and 23 points in early numeracy (22 in control).

In both control and intervention schools in Homa Bay, developmental scores of children with and without functional difficulties increased following the same trajectory. The overall IDELA score for children with functional difficulties in intervention schools increased by 20 points, and by 19 in control schools. Patterns were similar for scores in specific IDELA domains: for children with functional difficulties, motor development scores increased by 19 points in intervention schools (16 in control), socio-emotional scores by 15 points in both intervention and control schools, emergent literacy by 22 points in intervention (25 in control) and emergent literacy by 23 points (23 in control).

In Kakuma, results were similar. In intervention schools, the sample median overall IDELA score increased from 34 to 57 (from 32 to 56 for girls, and 35 to 57 for boys). The median change in children's individual scores was 22 (23 for girls, and 21 for boys). The scores of children in the control schools increased following the same pattern. The sample median score increased from 26 to 48 (from 23 to 46 for girls, and 27 to 53 for boys). The median change in children's individual scores was 22 (23 for girls, and 21 for boys). In intervention schools, median changes in children's individual scores for specific IDELA domains were 29 points in motor development (31 in control schools), 21 points in socio-emotional development (21 in control), 22 points in emergent literacy (17 in control) and 21 points in emergent numeracy (16 in control).

In Kakuma, developmental scores increased similarly for children with and without functional difficulties. The median overall IDELA score for children with functional difficulties increased by 18 points in both intervention and control schools. Scores in specific domains also increased but the pattern was not consistent. This inconsistency is unsurprising given the very small number of children with functional difficulties in the Kakuma sample at endline (33 across both control and intervention schools), and the results should be treated with caution. The median change in children's individual scores in motor and socio-emotional domains was lower in interventional schools than in control schools (19 versus 37, and 14 versus 26 points respectively), while the median change in emergent literacy and numeracy was higher in intervention schools than in control schools (24 versus 16, and 18 versus 9 points).

School attendance and educational outcomes

In this study, we also examined children's ECDE attendance rate and academic outcomes. In terms of their academic outcomes, we looked at whether the child's teacher reported that the child was meeting or exceeding expectations in any area of the national competency-based curriculum.

In intervention schools in Homa Bay, the availability of attendance records increased from 72% at baseline to 93% at endline. In control schools, it increased from 64% to 75%. In Kakuma, the availability of attendance records improved from 67% to 72% in intervention schools, and from 56% to 60% in control schools.

In Homa Bay, among children who had attendance records at both baseline and endline, 50% either improved their attendance or remained at full attendance in intervention schools, compared to 42.5% in the control schools. In Kakuma, among children with attendance

records at both points in time, 52.7% of those in intervention schools either improved their attendance or remained at full attendance compared to 27.1% in control schools.

In Homa Bay intervention schools, academic outcome records were available for 81% of children at baseline, and 91% at endline. In control schools, these proportions were 74% and 92%. Among children at intervention schools with academic outcomes records at both baseline and endline, 88% met or exceeded expectations at baseline and 96% at endline, compared to 84% and 92% of such children in control schools.

In Kakuma intervention schools, the proportion of children with academic outcomes records decreased from 83% at baseline to 67% at endline. In control schools, the proportion increased slightly over time, from 66% to 71%. Among children with academic outcome records at both baseline and endline, the proportion who met or exceeded expectations increased from 80% to 100% in intervention schools, and from 72% to 92% in control.

4.2 Key points for future policy and programmes

Critical new evidence

The study generated several important pieces of evidence that need to be considered in future policies and programmes. First, we found that a considerable number of children with functional difficulties attend pre-schools in Kenya: around 10% of all enrolled children in the study schools in Kakuma and around 20% in Homa Bay. The prevalence of functional difficulty in children is difficult to interpret, as the data continues to be limited and varied. The prevalence in Kakuma was similar to that found in an earlier ECDE study in Malawi (16). The prevalence in Homa Bay appeared to be high for this age group and requires better understanding of the types of functional difficulties and specific impairments causing them.

In contrast to common perceptions, we did not find any evidence that the developmental scores of children with functional difficulties were lower than those of children without functional difficulties, either at the start or end of pre-school. We also did not find evidence that the IDELA scores of children with functional difficulties changed on a different trajectory than those of children without functional difficulties. In our study, scores for children with functional difficulties increased by around 20 points over a period of five academic terms, which was much the same as children without functional difficulties.

It is important to note that IDELA scores would be expected to increase over time, as children grow and develop. However, extensive evidence exists demonstrating that in children without functional difficulties, attendance at ECDE significantly boosts early learning and development. Our data therefore suggests that in our sample, both children with and without functional difficulties are benefitting equally from participation in ECDE. This is crucial additional evidence in support of the importance of ensuring that children with functional difficulties have access to, and are able to participate in, ECDE. Further studies comparing developmental outcomes for children with functional difficulties attending and not attending ECDE will be critical in generating more definitive conclusions.

It is important to highlight that many children with very complex and profound disabilities are unlikely to be attending mainstream schools in study settings. This study, therefore, cannot say anything about their development scores, or how these change over time. Although the broader project did support children with complex disabilities enrolled in home schooling, these children were not included in this impact evaluation trial. Further studies of the developmental scores of children with complex disabilities receiving home-based educational support will be needed.

Regional variations

While our findings were broadly similar for both Homa Bay and Kakuma, we identified some noteworthy regional differences. Importantly, the developmental scores of children in Kakuma refugee camps were lower than those in Homa Bay. This is not surprising, given that these children came from households significantly affected by displacement, and often conflict. Children in this area also spoke a wide variety of languages, and often had no exposure to English or Kiswahili prior to starting school. This posed challenges for early learning in these languages, and also complicated the consistent administration of the IDELA (17). We did find that the developmental scores of these children improved over time at a rate similar to those in Homa Bay, indicating that they are continuing to develop, but may not be catching up. These findings highlight the particular importance of ECDE services for young children in humanitarian contexts.

Another regional difference was in poverty levels. We found very high levels of household poverty among children recruited in Kakuma. In this region, Equity Tool data placed 80% to 90% of households in both intervention and control areas in the two lowest quintiles, indicating that the sample was substantially poorer than the average Kenyan population. These extreme findings may relate partly to the nature of the Equity Tool which assesses households based on their assets, such as the type of roof or floor in their dwellings, the source of water and ownership of livestock (18). In a humanitarian context, this may be an inappropriate measure of poverty because the temporary nature of displacement likely affects refugees' behaviour in terms of accumulation and use of assets. For example, refugees may choose not to invest as much in high-quality durables as other households (19).

Variations by sex and household composition

We did not find any significant differences in the developmental scores or patterns of development between boys and girls in the sample as a whole, or among those children with functional difficulties. There is some evidence that girls showed better attendance at ECDE centres in Kakuma than boys. Girls attained slightly better academic outcomes than boys in Homa Bay, although this data should be treated with caution due to incompleteness and heterogeneity of these school records.

A substantial proportion of children in the sample (about 30% in Homa Bay and over 35% in Kakuma) were from single-parent (primarily mother) households. We did not find any

relationship between this household characteristic and child developmental outcomes, but children from single parent households were more likely to drop out from ECDE than children living with both parents. Further research to better understand the profiles of these children, and the relationship between family composition and ECDE participation, will be important – for both children with and without functional difficulties.

High levels of attrition in the study sample

One important finding of this study was the high proportion of children who were found to have left ECDE services during their pre-primary schooling. This was observed in both regions for children with and without functional difficulties, and in both control and intervention schools. Further studies exploring the characteristics of children who left, and their reasons for dropping out, will be of great importance.

It was also concerning to learn that among children who were not known to have left schools, there were many whose whereabouts were unknown, particularly in Kakuma. One of the reasons reported for high absenteeism during data collection was the erratic supply of food, firewood and water in schools, impacting on school feeding programmes. Food is a key incentive for school attendance in this setting and anything that affected its supply also affected school attendance. In Kakuma, there was also a substantial proportion of children who could not be recognised by their name by the teacher. This may have been driven by large class sizes (consistently well over 100 children per class) and high teacher turnover.

Interpretation of impact evaluation findings

Finally, our study did not show any additional impact of the disability-inclusive ECDE interventions delivered by the project on child developmental scores. The changes in children's developmental scores in intervention schools were similar to the changes in control schools across both regions, overall and for children with functional difficulties. It is worth documenting a number of factors related to the design of the intervention, its implementation and the context in which it was delivered, which may have reduced the likelihood that this impact evaluation would find any difference in children's developmental scores over the fairly short study timeframe.

Firstly, the project included a broad range of activities, some of which (awareness raising, advocacy, community mobilisation) did not have a direct impact on the teaching and learning practices within schools. The impact of these activities would need to be assessed in other ways, and potentially over a longer timeframe.

Secondly, although the project did deliver teacher training and capacity-building activities, this component was relatively small. Some of these interventions also took a long time to put in place, meaning that children in our study cohorts would have had only limited exposure to changes in teaching practices. Debrief meetings and discussions with teachers, which took place during the trial, showed that while teachers appreciated the capacity-building sessions on inclusive education, they also faced challenges in the application of new skills in their

classrooms due to the high student-to-teacher ratio. The teachers also requested additional support and refresher training sessions on various topics, such as how to effectively implement individualised education plans for children with disabilities.

Thirdly, some children did not attend ECDE regularly, meaning that their exposure to improved teaching practices would have been limited. In some intervention schools, teacher transfers also meant that trained teachers left the schools during the trial period.

Finally, the COVID-19 pandemic and its after-effects may have caused disruption and affected implementation of the interventions. The delayed start of the project, adjusting of term dates and compressing of school years that were highlighted in the baseline report (11) reduced the intended duration of exposure of children to the interventions. Pandemic-related effects may also have reduced children's attendance.

There is growing evidence of the pandemic's impact on children and schools, with many learners experiencing compromised acquisition of literacy and numeracy skills, despite various catch-up strategies including "crash" programmes and abridged curricula. The pandemic may also have exacerbated mental health issues experienced by both teachers and children, for example through increased tensions at home, financial constraints, sexual and gender-based violence, and COVID-related deaths. Teachers' own struggles during this period may also have negatively impacted on their ability to teach as effectively, or provide children with needed psychosocial support (20). Taken together, these may have affected the development scores of children.

Further, we did observe that in Homa Bay, median overall IDELA scores and median socio-emotional and motor scores were significantly higher for children in cohort 2 than in cohort 1, across both intervention and control schools. As cohort 1 children were the first group enrolled in pre-primary following COVID-19-related disruptions, this may suggest an impact of these disruptions. Detecting an intervention impact among this group may therefore have required a longer exposure duration.

Complementary qualitative research conducted during the project period reported that the interventions did have benefits that were not directly measurable by IDELA. These included better disability awareness in the community and reduced stigma around children with disabilities (21-23).

Finally, we did find some evidence to suggest that the project had a positive effect on the availability of attendance records in intervention schools, and also on children's attendance at ECDE. In both Homa Bay and Kakuma, more children in the intervention schools than in the control schools showed improvements in attendance rates during the study period. In Homa Bay, this was observed for all children, and for children with functional difficulties. In Kakuma, it was observed specifically for girls. While these findings are positive, they need to be treated with caution since in both areas the proportion of children included in this analysis was fairly low, due to gaps in data availability. Further studies to explore drivers of children's ECDE attendance will be of great value.

4.3 Limitations

The following limitations should be considered in relation to study findings:

- Literature supports the use of the IDELA for programme evaluation and monitoring purposes, but cautions are given against its use for international and cross-country comparisons (24). Given the substantial contextual differences between Kakuma and Homa Bay, it is therefore unclear how comparable the IDELA results are, and they should therefore be considered separately.
- Findings are not representative of all ECDE schools in Kenya, or even those within Homa Bay and Kakuma. The intervention schools were selected purposively, and some had been previously involved in other inclusive education projects.
- Sample attrition was substantial. Although the measured socio-demographic characteristics of those retained for the endline were generally similar to those who dropped out, and the attrition was not associated with either of the study arms, we do not know the IDELA scores for those who were lost to follow up. The high attrition rates additionally affected our overall sample size.
- The study used the 2017 version Equity Tool (based on 2014 Demographic and Health Survey data) to collect data on relative wealth, as this was the available version during baseline data collection activities. An updated version of the tool was subsequently released in March 2022, based on data from Kenya's 2020 Malaria Indicator Survey (18).

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6 Appendices

Appendix A: Demographic content from the caregiver interview

Background information

Parent/guardian's name/ Jina la mzazi/mlezi: _____

Relationship to the child/ Uhusiano na mtoto: _____

Marital status/ Hali ya kindoa: _____

Parent/guardian's highest level of education/ Kiwango cha juu cha elimu ya mzazi/mlezi: _____

Phone number/ Nambari ya simu: _____

Child's name/ Jina la mtoto: _____

Date of birth/ Tarehe ya kuzaliwa: _____

Gender/ Jinsia: _____

How many people usually live with you in your household?/ Mnaishi na watu wangapi katika boma hili?_____

How many siblings does the child have/ Mtoto huyu ana ndugu wangapi?

Is the child's natural mother alive/ Mama mzazi wa mtoto huyu angali hai?

Does the child's natural mother live with him/her in the same household/ Mtoto huyu anaishi na mama yake mzazi?

Is the child's natural father alive/ Baba mzazi wa mtoto huyu angali hai?

Does the child's natural father live with him/her in the same household/ Mtoto huyu anaishi na mama yake mzazi katika boma hili?

Appendix B: Kenya EquityTool

Questions	Option 1	Option 2	Option 3
Q1 Does your household have: electricity?	Yes	No	
Q2 a television?	Yes	No	
Q3 a sofa?	Yes	No	
Q4 a cupboard?	Yes	No	
Q5 a DVD player?	Yes	No	
Q6 a radio?	Yes	No	
Q7 a table?	Yes	No	
Q8 a clock?	Yes	No	
Q9 What is the main material of the floor of your dwelling?	Cement	Earth, sand	Other
Q10 What is the main material of the external walls of your dwelling?	Dung/mud/soil	Other	
Q11 What is the main material of the roof of your dwelling?	Thatch/grass/makuti	Other	
Q12 What type of fuel does your household mainly use for cooking?	Wood	LPG/natural gas	Other
Q13 What kind of toilet facility do members of your household usually use?	No facility/bush/field	Other	

Appendix C: UNICEF/Washington Group CFM

Appendix C.1: For 2 to 4 year-olds

Child functioning (age 2-4) CF		
CF1. I would like to ask you some questions about difficulties your child may have. Does (name) wear glasses?	Yes = 1 No = 2	2ðCF3
CF2. When wearing his/her glasses, does (name) have difficulty seeing? Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	1ðCF4 2ðCF4 3ðCF4 4ðCF4
CF3. Does (name) have difficulty seeing? Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	
CF4. Does (name) use a hearing aid?	Yes = 1 No = 2	2ðCF6
CF5. When using his/her hearing aid, does (name) have difficulty hearing sounds like people's voices or music? Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	1ðCF7 2ðCF7 3ðCF7 4ðCF7
CF6. Does (name) have difficulty hearing sounds like people's voices or music? Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	
CF7. Does (name) use any equipment or receive assistance for walking?	Yes = 1 No = 2	2ðCF10

Child functioning (age 2-4) CF		
CF8. Without his/her equipment or assistance, does (name) have difficulty walking? **Would you say (name) has: some difficulty, a lot of difficulty or cannot do at all?**	Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	
CF9. With his/her equipment or assistance, does (name) have difficulty walking? **Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?**	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	1ðCF11 2ðCF11 3ðCF11 4ðCF11
CF10. Compared with children of the same age, does (name) have difficulty walking? **Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?**	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	
CF11. Compared with children of the same age, does (name) have difficulty picking up small objects with his/her hand? **Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?**	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	
CF12. Does (name) have difficulty understanding you? **Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?**	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	
CF13. When (name) speaks, do you have difficulty understanding him/her? **Would you say you have: no difficulty, some difficulty, a lot of difficulty or cannot do at all?**	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	

Child functioning (age 2-4) CF		
CF14. Compared with children of the same age, does (name) have difficulty learning things? **Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?**	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	
CF15. Compared with children of the same age, does (name) have difficulty playing? **Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?**	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	
CF16. Compared with children of the same age, how much does (name) kick, bite or hit other children or adults? **Would you say: not at all, the same or less, more or a lot more?**	Not at all = 1 The same or less =2 More = 3 A lot more = 4	

Appendix C.2: For children aged 5 years and above

Child functioning (age 5-17) CF		
CF1. I would like to ask you some questions about difficulties your child may have. **Does (name) wear glasses or contact lenses?**	Yes = 1 No = 2	2ðCF3
CF2. When wearing his/her glasses or contact lenses, does (name) have difficulty seeing? **Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?**	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	1ðCF4 2ðCF4 3ðCF4 4ðCF4
CF3. Does (name) have difficulty seeing?	No difficulty = 1 Some difficulty = 2	

Child functioning (age 5-17) CF		
Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	A lot of difficulty = 3 Cannot do at all = 4	
CF4. Does (name) use a hearing aid?	Yes = 1 No = 2	2ðCF6
CF5. When using his/her hearing aid, does (name) have difficulty hearing sounds like people's voices or music? **Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?**	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	1ðCF7 2ðCF7 3ðCF7 4ðCF7
CF6. Does (name) have difficulty hearing sounds like people's voices or music? **Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?**	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	
CF7. Does (name) use any equipment or receive assistance for walking?	Yes = 1 No = 2	2ðCF12
CF8. Without his/her equipment or assistance, does (name) have difficulty walking 100 yards/meters on level ground? That would be about the length of 1 football field. [Or insert country specific example]. **Would you say (name) has: some difficulty, a lot of difficulty or cannot do at all?**	Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	3ðCF10 4ðCF10
CF9. Without his/her equipment or assistance, does (name) have difficulty walking 500 yards/meters on level ground? That would be about the length of 5 football fields. [Or insert country specific example].	Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	

Child functioning (age 5-17) CF		
Would you say (name) has: some difficulty, a lot of difficulty or cannot do at all?		
CF10. With his/her equipment or assistance, does (name) have difficulty walking 100 yards/meters on level ground? That would be about the length of 1 football field. [Or insert country specific example]. **Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?**	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	3ðCF14 4ðCF14
CF11. With his/her equipment or assistance, does (name) have difficulty walking 500 yards/meters on level ground? That would be about the length of 5 football fields. [Or insert country specific example]. **Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?**	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	1ðCF14 2ðCF14 3ðCF14 4ðCF14
CF12. Compared with children of the same age, does (name) have difficulty walking 100 yards/meters on level ground? That would be about the length of 1 football field. [Or insert country specific example]. **Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?**	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	3ðCF14 4ðCF14
CF13. Compared with children of the same age, does (name) have difficulty walking 500 yards/meters on level ground? That would be about the	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	

Child functioning (age 5-17) CF		
length of 5 football fields. [Or insert country specific example]. **Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?**		
CF14. Does (name) have difficulty with self-care such as feeding or dressing him/herself? **Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?**	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	
CF15. When (name) speaks, does he/she have difficulty being understood by people inside of this household? **Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?**	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	
CF16. When (name) speaks, does he/she have difficulty being understood by people outside of this household? **Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?**	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	
CF17. Compared with children of the same age, does (name) have difficulty learning things? **Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?**	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	
CF18. Compared with children of the same age, does (name) have difficulty remembering things?	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3	

Child functioning (age 5-17) CF		
Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	Cannot do at all = 4	
CF19. Does (name) have difficulty concentrating on an activity that he/she enjoys doing? **Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?**	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	
CF20. Does (name) have difficulty accepting changes in his/her routine? **Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?**	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	
CF21. Compared with children of the same age, does (name) have difficulty controlling his/her behaviour? **Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?**	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	
CF22. Does (name) have difficulty making friends? **Would you say (name) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?**	No difficulty = 1 Some difficulty = 2 A lot of difficulty = 3 Cannot do at all = 4	
CF23. How often does (name) seem very anxious, nervous or worried? **Would you say: daily, weekly, monthly, a few times a year or never?**	Daily = 1 Weekly = 2 Monthly = 3 A few times a year = 4 Never = 5	

Child functioning (age 5-17) CF		
CF24. How often does (name) seem very sad or depressed? **Would you say: daily, weekly, monthly, a few times a year or never?**	Daily = 1 Weekly = 2 Monthly = 3 A few times a year = 4 Never = 5	

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