Background paper prepared for the 2020 Global Education Monitoring Report

Inclusion and education

EDUCATION OF CHILDREN WITH VISUAL IMPAIRMENTS IN SUB-SAHARAN AFRICA: CHALLENGES AND OPPORTUNITIES

FOREWORD

It is my great pleasure to write the foreword to this report on the education of children with visual impairments in sub-Saharan Africa.

Education is something that is very close to my heart.

When I first went to school, I was able to read and write print. However, when I was 10, I started to find reading difficult and was given a pair of spectacles. When I was 14, I was unable to see print, even with the spectacles, but stayed in my mainstream school until I was 17. I then went to a special school for the blind where I learned braille and touch-typing. Due to the support I received in school, I acquired valuable skills and knowledge which in turn meant I obtained the qualifications that enabled me to go to college and enter the world of work. In short, without education I would not be where I am today.

This report is very important as it shows that the vast majority of children with visual impairments in sub-Saharan Africa do not receive an education of good quality. Even more worryingly, it shows that large numbers of these children do not go to school at all. The report also identifies the factors responsible for the educational marginalisation of children with visual impairments.

If the report only looked at the problems, it would be a very depressing piece of reading. Fortunately, it also provides examples of children being given good quality education, thanks to the collaborative efforts of parents, teachers, adults with disabilities, government and non-governmental organisations, and even children in schools. The final chapter also provides some clear recommendations for stakeholders at all levels of the education system.

I would like to congratulate everyone who has contributed to the production of the report, especially the Ministries of Education that provided valuable data and information. I would also like to thank GEM Report Team for commissioning this report.

I would urge everyone to read the report and strive to implement its recommendations.

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ACRONYMS AND ABBREVIATIONS

ADHD: Attention Deficit Hyperactivity Disorder

APCD: Association of Parents of Children with Disabilities

C-BC: Competency-based curriculum

CPD: Continuous professional development

CRPD: Convention on the Rights of Persons with Disabilities

DBSTs: District-based Support Teams

DHS: Demographic and Health Study

DPOs: Disabled People's Organisations

EARCs: Educational Assessment and Resource Centres

ECD: Early Childhood Development

EGRA   : Early Reading Grade Assessment

EMIS: Education Management Information System

FGD: Focus group discussion

FTFSSs: Field Test Full Service Schools

GPE: Global Partnership for Education

ICEVI: International Council for the Education of People with Visual Impairments

IEPs: Individual education plans

ILSTs: Institutional level support teams

MEST: Ministry of Education, Science and Technology

MoBE: Ministry of Basic Education

MoGE: Ministry of General Education

NEMIS: National Education Management Information System

NGOs: Non-governmental organisations

O&M: Orientation and mobility

PCD: Partnership for Child Development

SDGs: Sustainable Development Goals

SHIP (Initiative): School Health Integrated Programming

SHN: School health and nutrition

SSRCs: Special Schools as Resource Centres

SMCs: School Management Committees

UMAV: Malian Union of the Blind

URE: Uncorrected refractive errors

WGSSQD: Washington Group Short Set of Questions on Disability

VICTAR: Vision Impairment Centre for Teaching and Research (at the University of Birmingham)

WBU: World Blind Union

CONTENTS

EXECUTIVE SUMMARY

This report analyses education provision for children with visual impairments across sub-Saharan Africa. It draws on data from a variety of sources, including data provided by 11 Ministries of Education in sub-Saharan Africa – much of it collected through their Education Management Information Systems (EMISs).[1] As will be discussed, this data is often lacking in reliability, comparability and comprehensiveness. There are also significant differences in education provision between and within countries. However, despite these limitations, it is still possible to draw tentative generalisations about educational realities for children with visual impairments in sub-Saharan Africa.

Achievements

Census data from 13 sub-Saharan Africa countries[2] indicates that there has been significant progress in recent decades as an increasing percentage of children with visual impairments are both enrolling in primary school and completing a full course of primary education (Wodon *et al*, 2019). According to the data, gains for girls with visual impairments have been particularly striking – while boys are 5.2% more likely to complete a full course of primary education, girls are now 17.9% more likely to do so. In fact, in terms of primary enrolment and completion, the data indicates girls are catching up with boys – although, as will be discussed, EMIS data provided by 11 Ministries of Education for this study presents a different picture. Census data also indicates literacy rates for both boys and girls with visual impairments have significantly increased, again with girls making greatest progress (*ibid*).[3]

This progress can be attributed to:

- The commitment of parents, teachers and other community stakeholders to ensuring children with disabilities (girls and boys), including children with visual impairments, have the same educational opportunities as other children

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[1] Data was provided by Ministries of Education in Cameroon, Ghana, Kenya, Liberia, Malawi, Mali, Nigeria, Senegal, Sierra Leone, Uganda and Zambia.

[2] Benin 2013; Burkina Faso 2006; Ethiopia 2007; Ghana 2010; Kenya 2009; Liberia 2008; Malawi 2008; Mali 2009; Mozambique 2007; Senegal 2012; South Africa 2011; South Sudan 2008; Zambia 2010.

[3] However these figures should be treated with caution as they are subjective perceptions of the literacy of household members by census respondents (Wodon *et al*, 2019).

- The dynamism and creativity of the disabled people's movement in sub-Saharan Africa and civil society organisations generally

- The increased importance attached to inclusive education for children with disabilities by Ministries of Education, other government agencies, and the international development community

- The impact of international conventions and agreements on educational policy, practice, and discourse, particularly:

– The Millennium Development Goals (2000-2015), especially Goal 2 (Universal Primary Education) and Goal 3 (Gender Equality)

– The United Nations Convention on the Rights of Children with Disabilities (2006), especially Article 24 which identifies the non-negotiable educational entitlements of children with disabilities

– The Sustainable Development Goals which will run from 2015-2030 and commit governments to providing inclusive, equitable and quality education for children with disabilities, girls and boys, by 2030, as well as a range of other services

Challenges

Table 1 presents further analysis of the census data from 13 sub-Saharan countries (see previous page). It shows that, despite significant progress, boys and girls with visual impairments in these countries are significantly less likely to enrol in primary education and acquire literacy than their non-disabled peers. It also shows boys with visual impairments are less likely to complete a full course of primary education. Regression analysis revealed that the gaps between children with visual impairments and other children were due to the children's disability – i.e. the impact of disabling social attitudes, practices and environments on the children's education, combined with the impact of children's impairments on their educational functioning – rather than other factors (e.g. socio-economic disadvantage). The authors of the study also concluded that the gaps between children with visual impairments and non-disabled children (in terms of primary enrolment, primary completion and the acquisition of literacy) had not narrowed over recent decades (Wodon et al, 2019).

Table 1: Disability Gaps between Children with Visual Impairments and Non-Disabled Children in sub-Saharan Africa (%)[4]						
Sample: 13 sub-Saharan African Countries						
	Ever enrolled (12 years old)		Primary completed (16 years old)		Literacy[5] (12 years old)	
	Boys	Girls	Boys	Girls	Boys	Girls
No disability	76.0	74.4	50.3	48.8	62.2	62.1
Visual impairment	70.6	69.8	46.2	49.3	56.8	60.1
Gap	5.4	4.6	4.1	-0.5	5.4	2.0

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[4] Source: Wodon et al, 2019, p. 15.

[5] See footnote 2.

The above authors also analysed the 2014 PASEC test results in ten francophone countries[6] and found that, in the vast majority of countries, average scores in both reading and mathematics were substantially lower for Grade 6 students reporting difficulties with seeing than other Grade 6 students (Wodon *et al*, 2018).

Data collected from 11 Ministries of Education in sub-Saharan Africa for this study similarly reveal significant 'disability gaps' between children with visual impairments and non-disabled children, and indeed present a bleaker picture than the census data.[7] For instance:

- In Kenya, Liberia, Malawi and Uganda, only a small proportion of the total number of students with visual impairments enrolled in education were attending secondary schools (5.2%, 13.8%, 8.5% and 9.2% respectively), indicating that large numbers of children in these countries are not transiting from primary to secondary education.[8]

- Data from Uganda indicates that only a small proportion of children enrolled in primary and secondary education actually took end-of-school formal examinations.[9]

Eight of the 11 Ministries provided sex-disaggregated data for primary enrolment (collected through their EMISs). As Table 2 shows, the data shows disproportionately low number of girls recorded by EMISs as enrolled in primary education in six of the eight countries – again, in contrast to the census data analysed by Wodon *et al* (2019). Only in Malawi and Mali were there marginally more girls recorded as enrolled in primary education. In the other countries, the percentage of girls recorded as enrolled in primary education ranged from 46.4% in Senegal to 31.5% in Zambia.

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[6] The countries were Benin, Burkina Faso, Burundi, Cameroon, Chad, Cote d'Ivoire, Congo, Niger, Senegal and Togo. Children reporting seeing difficulties only scored higher in mathematics in Chad and in reading in Chad and Togo.

[7] However, this data should be treated with caution, as will be discussed.

[8] The secondary data from Kenya only includes students enrolled in special and integrated schools so does not provide a full picture.

[9] Again, this data was not available from other countries.

	Ghana	Kenya	Liberia	Malawi	Mali	Senegal	Uganda	Zambia
Boys	214	24,790	488	17,789	125	89	24,790	5,004
Girls	133	12,002	429	17,843	127	77	12,002	2,300
Total	347	36,792	927	35,632	247	166	36,792	7,304
% girls	38.3	32.6	46.3	50.1	50.6	46.4	32.6	31.5

Table 2: Numbers of children with visual impairments enrolled in primary education according to EMIS data provided by Ministries of Education in 2019

The data in Table 2 is not comprehensive, reflecting the limitations of national EMISs, and therefore should be treated with caution. Specifically, the data for Ghana is only for children enrolled in special schools who are blind, the data for Zambia only includes children enrolled in special and integrated schools, and the data for Mali only includes students enrolled in special schools. However, the incompleteness of the data is itself significant, as it shows that EMIS in some countries do not collect data on certain groups of students (likely to include disproportionate numbers of girls).[10] This is a matter of concern as Ministries of Education in these countries are unable to provide these unrecorded students with targeted support because their number and whereabouts are unknown.

As will be discussed in this report, girls with visual impairments are not only the group of students with visual impairments who experience disproportionate educational disadvantage. Other, often overlapping, groups include: children who are blind or who have severe visual impairment; children with additional disabilities (such as children with deafblindness); children with albinism (particularly those living in Southern African countries); children from particularly socio-economically-disadvantaged backgrounds; children living in rural areas; and children living in fragile states and conflict/post-conflict situations.

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[10] The situation in Kenya is different from Ghana, Mali and Zambia. The Ministry of Education in Kenya informed us that they collect enrolment data for children in mainstream schools (as well as children in special and integrated schools), but this data at present is neither utilised by the Ministry of Education nor made externally available.

Due to lack of educational opportunities, young people with visual impairments often lack the qualifications and social skills and connections to enter the labour market and lead meaningful and fulfilling lives in their communities.

Why do children with visual impairments still experience disproportionate educational disadvantage and discrimination? Analysis of available data and information indicates:

- Teachers in mainstream schools are often unable or unwilling to make even minor pedagogical adaptations to accommodate the impairment-related special educational needs of children with visual impairments due to a variety of factors – lack of access to appropriate training and continuous professional development, low teacher morale, large classes, shortage of resources, dilapidated classrooms, and so on.

- Children with visual impairments (particularly those enrolled in mainstream schools) have little or no access to necessary assistive technology – for instance, optical and non-optical low-vision aids for children with low vision and braille writing equipment and braille reading materials for children who are blind.

- Classrooms are noisy and poorly lit, making learning particularly difficult for children with visual impairments.

- Children with visual impairments are often excluded from certain subjects such as Mathematics and Science because it is erroneously believed that their lack of sight means they cannot study these subjects and/or their teachers do not have the skills and equipment to deliver these subjects to children with visual impairments.

- School buildings and grounds lack accessibility, and travelling to and from school can be challenging.

- Children with visual impairments (particularly those in mainstream schools) have little or no access to the specialist tuition and training that will enable them to acquire key sets of skills – for instance, orientation and mobility instruction and braille tuition.

- Children with visual impairments, particularly children with albinism, suffer disproportionate levels of bullying and other forms of child abuse.

- Children with visual impairments often do not receive functional and clinical assessments and, even if they do, may not receive the necessary follow-up-services such as assistive devices, treatment, medication and therapy. Post-assessment, eye health/education professionals often fail to provide parents and teachers of children with visual impairments with clear, practical advice.

These problematic realities described above can be placed in the broader context of:

– Lack of good quality early childhood development which provides the foundations for children's future development and a stepping-stone to formal education

– Lack of investment/poorly-targeted investment in schools and education support systems – for instance, school inspection systems, advisory support services, teacher training colleges, and systems for providing continuous professional development

– EMISs that collect insufficient/unreliable data

– Eye health services that are patchy and of variable quality

– Lack of coordination between service providers and particularly Ministries of Education and Health

– Policy frameworks that are insufficiently comprehensive, internally contradictory, poorly disseminated, and lack effective monitoring mechanisms and budgetary provisions

– Lack of priority traditionally attached to the education of children with disabilities by large swathes of the international development community

The presence of large numbers of special schools, particularly in Anglophone countries, is also a subject for ongoing debate and discussion. Concerns have been raised about the quality of the education in these institutions, the extent to which they segregate children with visual impairments from their sighted peers, their lack of accessibility for some children (for instance, those from poorer families), and the vulnerability of children in residential care to various types of abuse. Children with low vision enrolled in these institutions are also sometimes required to learn braille, even though they should be reading and writing print. Finally, children with visual impairments enrolled in special schools often have more access to specialist support and resources than those enrolled in mainstream schools, raising concerns about inequity of provision.

Opportunities

While there are immense challenges, there are also grounds for optimism. Ministries of Education in sub-Saharan Africa – working in close association with civil society, non-government education providers, and the international development community – are increasingly prioritising the education of children with disabilities, including children with visual impairments. For instance, they are:

- recognising the importance of promoting early childhood development of good quality for young children with disabilities.

- strengthening EMISs so they collect more disability- and sex-disaggregated data and do so more effectively.

- increasingly expecting special schools to play a broader role in education systems, providing outreach services for mainstream schools.

- actively participating in a range of inclusive education initiatives, although these initiatives still tend to be overly dependent on donor-funding and external technical assistance.

The final section of this report (*Looking to the future*) describes examples of good practice in five different countries. Each case study describes how local stakeholders, working at different levels of education systems and focusing on different elements of these systems, have sustainably improved education provision for children with visual impairments. Collectively, the studies show what can be achieved in even the most challenging circumstances.

INTRODUCTION

The Global Education Monitoring (GEM) Report is an editorially-independent report established in 2002 that is hosted and published by the United Nations Educational, Scientific and Cultural Organization (UNESCO) headquarters in Paris. The Report monitors progress towards education targets in the Sustainable Development Goals (SDGs) adopted by the United Nations member states in September 2015. Its mandate is drawn from the World Education Forum and the Education 2030 Framework for Action, which requested it to be the mechanism for monitoring and reporting on:

- SDG 4 (the global education goal) and education in the other SDGs

- The implementation of national and international strategies to help hold all partners to account for their commitments, as part of SDG follow-up and review mechanisms

2020 Global Education Monitoring Report focuses on inclusion. The Report will take as its starting point General Comment 4 of the Convention on the Rights of Persons with Disabilities (CRPD) Committee, made in 2016. The Comment specifies that inclusive education "focuses on the full and effective participation, accessibility, attendance and achievement of all students, especially those who, for different reasons, are excluded or at risk of being marginalised" (UNESCO 2019).

GEM Report Team requested Sightsavers to produce a report on educational realities for children with visual impairments in sub-Saharan Africa. It was suggested the report provides relevant statistics, broader analyses of education systems, and illustrative case-studies in order to generate useful learning for policy makers and implementers around the world.

The term "children with visual impairments" in this report refers to both children who are blind and children with low vision[11]. The report will also discuss children with uncorrected refractive error, as these children experience significant difficulties that prevent them achieving their potential unless provided with appropriate refraction.

In 2010, there were an estimated 1.26 million children who were blind, globally. About one third of these children or an estimated 419,000 of them lived in sub-Saharan Africa (Asferaw *et al*, 2017). In addition, there is a large number of children with functional low vision and a still larger number of children with uncorrected refractive error (Gilbert & Lepvrier-Chomette, 2019). Major causes of visual impairment in

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[11] Someone who is blind has a visual acuity of 3/60 or worse, or a visual field of less than 10 degrees in diameter. A person with low vision has an impairment of visual functioning – not correctable by glasses, contact lenses, medicine, or surgery – that interferes with the person's ability to perform everyday activities. These individuals have a reduced visual acuity (poor detailed vision) in the range of less than 6/18 to better than 3/60 (as measured on a distance eye chart), or a reduced visual field (poor peripheral vision) of less than 20 degrees in diameter.

children depend on the local context but may include cataract, Vitamin A deficiency, retinopathy of prematurity, paediatric glaucoma, amblyopia and uncorrected refractive error (Courtright *et al*, 2011; Courtright 2012; Gilbert & Lepvrier-Chomette, 2019). In sub-Saharan Africa, visual impairments in children must be put in the broader socio-economic context of "poverty, lack of education, inadequate health-care services and the lack of opportunity for people to control or influence their health care" (Naidoo, 2007, p. 417).

This report describes educational realities for children with visual impairments in sub-Saharan African countries and the factors shaping these realities. It also identifies ways of improving educational access and quality for these children. In order to do this, it draws on a substantial and varied evidence-base. The report not only discusses the educational needs of children who are blind and children with low vision, but the specific needs of particular groups: girls with visual impairments, children with albinism, and children with deafblindness. The educational needs of children with uncorrected refractive error are also discussed.

Article 24 of the United Nations Convention on the Rights of Persons with Disabilities (2006) identifies the non-negotiable educational entitlements of children with disabilities. Children with disabilities have the right to "an inclusive, quality and free primary and secondary education" "at all levels" within the "general education system", which develops their "personality, talents and creativity (and) their mental and physical abilities", as well as providing them with "the life and social development skills" necessary for their participation in education and community life. Such provision should involve "reasonable accommodation" – in other words, educational institutions should be as responsive as possible to the impairment-related special educational needs of children with disabilities who should also receive the necessary types and levels of one-to-one assistance. When necessary, children with disabilities should also access "augmentative and alternative modes, means and formats of communication." Children with disabilities and their non-disabled peers should be encouraged to form friendship groups and support one another's learning.

General Comment 4 on UNCRPD (2016) emphasises that inclusive education is only possible if educational systems are fully accessible, including "buildings, information and communication…, assistive systems, curriculum, education materials, teaching methods, assessment and language support services". Accessibility necessitates the application of the principles of Universal Design, but "does not exclude the provision of assistive devices, applications, and software to those learners with disabilities who may require them". General Comment 4 (2016) also notes that "Progressive realisation means that state parties have a specific and continuing obligation to move as expeditiously and effectively as possible towards the full realisation of article 24."

What are the specific implications of UNCRPD for children with visual impairments? UNCRPD affirms their right to access:

- a broad and balanced curriculum.
- in line with the principle of progressive realisation, fully-accessible mainstream education systems in which they learn alongside their non-disabled peers.

- participatory and relevant learning opportunities that, among other things, enable children who are blind to learn through non-visual pathways, and children with low vision to make best use of their residual vision.
- additional classroom-based support when this is necessary – for instance, from classroom assistants.
- necessary assistive devices – for instance, customised spectacles, magnifiers, thick-tipped pens, and sloping desks for children with low vision, and braille reading and writing equipment and materials for braille users (see Appendix 2).
- accessible school infrastructure (classrooms, latrines, corridors, pathways, and so on).
- the 'plus curriculum' – for instance, training/tuition by skilled personnel in orientation and mobility and daily living skills (for all children with visual impairments) and braille tuition (for children who are blind, have severe visual impairments, or will experience progressive sight loss).
- transport arrangements that enable them to travel easily, safely and comfortably to and from school and other centres of learning.

The Sustainable Development Goals reinforce UNCRPD as they affirm the right of children with disabilities, including children with visual impairments, to "inclusive, equitable and quality education", starting with "early childhood development, care and pre-primary education" (Target 4.2) and progressing to primary and secondary education and from there to vocational and tertiary education.

This report will address the question: "Are children with visual impairments in sub-Saharan Africa able to access inclusive education as defined in UNCRPD, and, if not, how can state- governments, working in association with civil society and the international development community, ensure these children have this access?"

SOURCES OF DATA AND INFORMATION

In order to obtain a broad, balanced and multi-dimensional picture of educational realities, data and information was obtained from a variety of sources:

1. **A questionnaire-based survey** completed by representatives of Ministries of Education. The survey was conducted by Sightsavers staff in 11 sub-Saharan African countries: Cameroon, Ghana, Kenya, Liberia, Malawi, Mali, Nigeria, Senegal, Sierra Leone, Uganda and Zambia. These countries were chosen because they represented Western, Central, Eastern and Southern African countries and included both Francophone and Anglophone countries. They are also all countries in which Sightsavers has developed close working relationships with Ministries of Education. Ministries of Education were asked to provide data on enrolment, transition and outcomes for children with visual impairments at pre-primary, primary and secondary levels of the education system. They were also asked to provide information on:

   - Education Management and Information Systems (EMISs)

   - Types of education provision available for children with visual impairments (special schooling, integrated education and full mainstreaming)[12]

   - Availability of different types of human resource support for children with visual impairments (for example, specialist teachers of children with visual impairments, orientation and mobility instructors, habitation and rehabilitation professionals)

   - Types and levels of access to assistive technology

   - Availability of braille and large-print reading materials

   - Quality and coverage of eye health services

   - Current programmes in the field of disability and education supported by the international development community

   - Perceived strengths and weaknesses of their education systems in the field of inclusive education for children with disabilities, particularly children with visual impairments

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[12] Integrated schools are mainstream schools with resource centres/units attached. Children with visual impairments spend a certain proportion of their school-time in these centres/units, and sometimes all their time. Children who are fully mainstreamed spend all their time in mainstream classes, studying alongside their fully-sighted peers.

2. **Literature review**. This drew on relevant literature on the education of children with visual impairments in sub-Saharan Africa. This consisted largely of articles in peer-reviewed journals, but relevant grey literature was also reviewed. These documents included both qualitative and quantitative primary studies (Habulezi & Phasha, 2012; Habulezi *et al*, 2017; Human, 2010; Morelle, 2016; Lynch *et al*, 2011a; Lynch *et al*, 2011b; Brydges & Mkandawire, 2016; Asamoah *et al*, 2018); evaluations of education projects supported by the international development community (Lynch *et al*, 2018; Ceralli, 2019); multi-level analyses of education systems (Sukhraj-Ely, 2008; Fish-Hodgson & Khumalo, 2015); and analyses of existing statistical data (Wodon *et al*, 2018, 2019).

3. **Focus group discussion**. A 90-minute focus group discussion (FGD) was held in August 2019, with five leading members of the disabled people's movement in sub-Saharan Africa, all of whom are visually impaired and hold senior positions in national disability organisations, as well as international bodies such as the International Council for the Education of People with Visual Impairments (ICEVI) and the World Blind Union (WBU). FGD participants were from Ghana, Kenya, South Africa, Tanzania and Togo. The focus group discussion gave an opportunity for the participants to discuss education provision in their respective countries at length, and accordingly provided rich insights into education provision in the region. A transcript of this discussion is available from the authors.

4. **Project-level information**. This report also includes information from Sightsavers' education and eye health projects in sub-Saharan Africa. Sightsavers' Global Policy and Advocacy team also provided information on policy frameworks in sub-Saharan African countries and the progress of the Marrakesh Treaty. Sense International provided information about educational realities for children with deafblindness in sub-Saharan Africa, and the organisation's work in this field.

While the responses to the survey were extremely useful, the data has various limitations, which need to be taken into account while using and interpreting the data:

- Three of the 11 countries did not provide enrolment data. The enrolment data collected by the other eight countries through their EMISs was incomplete in various respects – i.e. the data only covered certain phases of education, types of education provision, sets of school, and/or groups of students, or was not disaggregated by sex/degree of impairment. Only four of the countries provided data on the number/ percentage of children transiting from one grade to the next at the end of the academic year, and this data raises more questions than it answers. (The above issues are discussed in greater detail on pages 21 to 23 of this report.) It is also likely that variations between the data-sets submitted by the individual countries not only reflected differences between their education systems and surrounding

contexts, but different definitions[13] and contrasting data-collection methodologies and competencies (see below).

- The Ministry of Education in Kenya noted that the data provided by schools was not always reliable, as relevant teaching staff sometimes lacked the IT skills to enter data correctly, and head teachers sometimes exaggerated the number of children with visual impairments (and presumably other children with disabilities) in their schools in order to collect enhanced capitation allowances. Furthermore, schools are only able to register children with birth certificates. Given the limitations of EMISs across sub-Saharan Africa and the challenges involved in collecting disability-disaggregated data, it is likely that the data provided by all the Ministries of Education possess similar sorts of limitations.[14]

- The data is not always up-to-date. For instance, the data from Uganda is from 2015/2016 and the data from Liberia is from 2016/2017.

- The Ministries did not have any estimates for the total number of children with visual impairments in the country and therefore could not estimate the proportion of children with visual impairments who are in-school/out of school.

Encouragingly, when asked to assess the capacity of their EMISs to collect educational data on children with visual impairments, nine countries recognised their EMISs needed to be significantly strengthened (the other two countries did not answer this question). Encouragingly also, Sierra Leone started to collect disability-disaggregated educational data in 2019 (although the data was not available at the time of writing), and Senegal will collect such data from 2020.

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[13] Not only differences in defining visual impairments and associated terms (e.g. blindness, low vision), but differences in defining education phenomena (e.g. enrolment).

[14] It is not only EMIS systems in sub-Saharan Africa that possess significant limitations, re the collection of disability-disaggregated data. According to UNESCO Institute for Statistics (2019), a multi-regional review in 2015 of 40 EMIS census forms found 19 countries did not have any data on students with disabilities. Furthermore, when such data was included it was done in "an ineffective or in an inappropriate fashion" (p. 6).

EDUCATIONAL EXPERIENCES AND OUTCOMES FOR CHILDREN WITH VISUAL IMPAIRMENTS

Enrolment and transition

This section of the report draws on the results of the literature review, the survey of the Ministries of Education, and the focus group discussion conducted as part of this study.

Literature review

There is a lack of reliable data on education for children with visual impairments, including data on enrolment and transition. This is because data collected through censuses, surveys and education management information systems (EMISs) (when such data exist) is highly problematic due to conceptual and operational difficulties in defining and measuring different types of disability in children (Loeb *et al*, 2018).

However, available data provides some valuable insights into the current situation. For example, Mizunoya *et al* (2016, 2018) have identified five comparable surveys that used the *Washington Group Short Set of Questions on Disability* (WGSSQD) in six sub-Saharan African countries – Ethiopia (rural), Malawi, Nigeria, South Africa, Tanzania, and Uganda. These surveys found that children with disabilities were between 1.9 to 3.7 times more likely to be out of primary education and 1.8 to 2.1 times more likely to be out of secondary education than their non-disabled peers. The rates of exclusion for primary education varied from 7.0% in South Africa to 69.1% in Nigeria and for secondary education from 20.7% in South Africa to 98.0% in rural Ethiopia. Data for Uganda, Malawi and Tanzania showed that the majority of children with disabilities had never attended school.

Mizunoya's analyses did not discuss educational access for children with visual impairments in particular. However, based on their analysis of census data from 13 sub-Saharan Africa countries[15], Wodon *et al* (2019) concluded that enrolment and completion rates for children with visual impairments have significantly improved in recent decades. They found an increasing proportion of children with visual impairments are not only enrolling in primary school but also completing a full course of primary education. They also found the gains for girls with visual impairments were particularly striking – while boys were 5.2% more likely to complete a full course of primary education, girls were now 17.9% more likely to do so. Despite this progress, Wodon *et al* found that, compared with their fully-sighted peers, children with visual impairments were 5% more likely never to enrol in primary school. They also found that these gaps had not narrowed over time. The authors of the study carried out regression analysis to establish the extent to which the educational disadvantage experienced by children with visual impairment was due to their 'disability' – in other words, the impact of their visual impairment in interaction with disabling social and physical

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[15] Benin 2013; Burkina Faso 2006; Ethiopia 2007; Ghana 2010; Kenya 2009; Liberia 2008; Malawi 2008; Mali 2009; Mozambique 2007; Senegal 2012; South Africa 2011; South Sudan 2008; Zambia 2010.

environments. They concluded that it was highly significant – equivalent in terms of its impact to a "quintile of wealth of the child's household" (p. 3).

Based on their analysis of the same data, they also concluded that enrolment and completion rates for children with visual impairments were higher than for children with disabilities in general "perhaps because visual impairment tends to be have smaller negative effects on educational outcomes than more severe types of disabilities" (Wodon *et al*, 2019, p. 10). Similarly, data from the *Uganda Demographic and Health Survey* (DHS) indicated that school attendance for children aged 6-17 years was higher for children with hearing and seeing difficulties (69.53% and 71.30% respectively) than for children experiencing severe difficulties with mobility (49.69%), communicating (40.75%) and self-care (35.77%) (Moyi, 2012).

Kuper *et al* (2014), reviewing data on children enrolled in Plan International's sponsorship programme in 13 countries in sub-Saharan Africa, also found disproportionately high rates of educational exclusion for children with disabilities, with considerable variation between countries. They also noted that children with disabilities were often studying alongside much younger children – presumably because they started their education late, experienced an interrupted education, and/or were prevented from transiting from one class to another (often due to poor test results).

Survey and FGD data

Eight of the 11 countries participating in the survey provided enrolment data obtained through their EMISs (Ghana, Kenya, Liberia, Mali, Malawi, Senegal, Uganda and Zambia). Three countries did not provide this data – Cameroon, Sierra Leone and Nigeria. However, the data from these eight countries was incomplete in various respects:

- Only three countries (Ghana, Liberia and Uganda) provided data for all three stages of education – pre-primary, primary and secondary. Kenya, Malawi and Zambia provided primary and secondary enrolment data, but no pre-primary enrolment data. Mali and Senegal provided primary enrolment data only.

- Liberia, Malawi and Uganda provided data for all the forms of education provision available for children with visual impairments in their countries (these forms characteristically consisted of special schooling, integrated schooling and full mainstreaming).[16] Zambia only provided data for children enrolled in special and integrated schools, the secondary school data provided by Kenya only covered special and integrated schools, while Ghana and Mali

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[16] Integrated schools are mainstream schools with resource centres/units attached. Children with visual impairments spend a certain proportion of their school-time in these centres/units, and sometimes all of their time. Children who are fully mainstreamed spend all their time in mainstream classes, studying alongside their fully-sighted peers.

only provided data for children enrolled in special schools. Senegal only provided data for children enrolled in mainstream primary schools supported by Sightsavers.

- All eight countries provided at least some sex-disaggregated enrolment data. However, Kenya and Malawi did not provide sex-disaggregated secondary enrolment data.

- Kenya, Malawi, Mali, Senegal, Uganda and Zambia provided data disaggregated by severity of impairment – i.e. they provided data both for blind children and children with low vision. Ghana provided data only for blind children. Liberia only provided data for children with visual impairments in general.

- Only Ghana, Malawi, Mali and Zambia provided enrolment data for children with visual impairments with additional disabilities. Kenya, Liberia, Senegal and Uganda did not provide this data.

- No countries provided net enrolment data for children with visual impairments. Wodon *et al's* 2019 study provides this data and is therefore very useful (see Table 1 on page 9).

It is also important to note that the study did not collect information on the definitions or methodologies used by the countries to record data on children with visual impairments. Significant variations between the countries may reflect the differences in the definitions and methodologies used. For example, in some countries reporting large numbers of children with visual impairments enrolled in schools, the records may include the number of children diagnosed with refractive error. Ministry of Kenya acknowledged that data only covered children with birth registration certificates. Ministry of Kenya also acknowledged that head teachers sometimes lack the ICT skills and may exaggerate the number of children with visual impairments in their schools to obtain the associated capitation funds. Data collection processes may be similarly problematic in other countries.

The number of children reported in school varied from 166 in Senegal[17] to 46,750 in Uganda. In Nigeria, the Ministry of Education could not provide data on enrolment of these children but estimated that there could be up to 100,000 children with visual impairments enrolled in primary and secondary schools across the country.

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[17] As already mentioned, the data from Senegal did not cover pre-primary and secondary education.

Among the eight countries providing primary enrolment data disaggregated by sex (see Table 2 on page 10), the proportion of girls among children with visual impairments enrolled in primary education ranged from 50.6% in Mali[18] to 31.5% in Zambia. In six of these countries, there were significantly fewer girls than boys enrolled in primary education according to the data.

As already mentioned, data disaggregated by severity of visual impairment (blind or low vision) was only available in six countries. The proportion of children who were blind among all children with visual impairments enrolled in education varied from 1.6% in Malawi to 38.6% in Senegal.

Only three of the countries provided data disaggregated for all three levels of education – pre-primary, primary and secondary (Ghana, Liberia and Uganda). Of the six countries providing data on enrolment in both primary and secondary education, Ghana and Zambia had relatively high proportions of students with visual impairments enrolled in secondary education (47.7% and 30%) (see Table 3 on page 32). However, it is important to note that in Ghana, the enrolment data was available only for children who were blind and attended special schools, and the total number was relatively small (663 children in total). In the remaining four countries, the proportion of children enrolled in secondary education ranged from 13.8% in Liberia to 5.2% in Malawi.

When asked about the type of schools available for children with visual impairments, all 11 countries reported that some children with visual impairments attended special schools (separate institutions in which they are taught apart from their fully-sighted peers). Six countries (Kenya, Malawi, Mali, Nigeria, Uganda and Zambia) also reported integrated schooling (in which children with visual impairments attend mainstream schools but learn separately from the other pupils at least some of the time). Full-mainstreaming (in which children with visual impairments learn alongside their fully-sighted peers all the time) was reported in all of the countries except Malawi.[19]

Home-based educational provision for children with visual impairments was reported in Kenya and Uganda only.

Four countries provided data on the number/percentage of children with visual impairments transiting from one grade to the next in the last academic year (2018 or the latest available) – Mali, Senegal, Uganda and Zambia. However, the reported data varied and was difficult to interpret. In Senegal and Mali, where a relatively small number of children with visual impairments was reported (166 and 252, respectively) and where children with visual impairments attended primary education only, the transition rates were reported as 100% and 73% respectively. In Uganda and Zambia, where much larger numbers of children with visual impairments were reported across different levels of education, the transition rates were much

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[18] However, Mali only provided data for children enrolled in special schools.

[19] The response from Malawi appears to be incorrect. In their inclusive education situation analysis, Grimes *et al* (2013) found significant numbers of children with visual impairments enrolled in mainstream schools in Malawi, including mainstream schools without resource centres. It is possible the respondents misunderstood the survey question.

lower. In Uganda, the number of children with visual impairments who transitioned was reported to be 539 out of 46,750 enrolled (1.2%). In Zambia, 10,432 children with visual impairments were enrolled in schools and the transition rate was reported at 7%. The transition rates for Uganda and Zambia are implausibly low, and the figures should therefore be treated with considerable caution. Transition rates between the different phases of education are discussed on pages 32-33 of this report.

Comprehensive and reliable enrolment/transition data assists Ministries of Education to assess the extent to which their education systems are meeting the needs of educationally marginalised and excluded children and, in the light of this analysis, to make their education systems more accessible and inclusive for these children. Unfortunately, the 11 countries surveyed did not collect this data.

Data from the FGD conducted by Sightsavers corroborated findings of the survey, showing that the system of education based on residential special schools continued to be strong in sub-Saharan Africa. However, these schools were described as expensive and the number of places available was reported to be low. Only a fraction of children with visual impairments could therefore access such schools. Education of children with visual impairments in mainstream schools was reported to be limited due to low budget allocations and limited capacity of these schools to provide quality education, as described by a participant from Ghana.

Participant FGD, Ghana:

"In Ghana…the residential special schooling system remains strong, despite efforts to promote inclusive education. Because of the strength of the special schooling system, it limits the number of children who can access education. I also want to say that boarding schools as a whole is a kind of a class thing in Ghana and so the residential schools are seen to be of higher class and quality. The inclusive education approach started many years ago, but we haven't got where we want to. For instance, the budget allocation for inclusive education is lower this year than last year."

Similar experiences were reported by a participant from South Africa, where mainstream inclusive schools were set up to improve access to education for children with disabilities who could not access special schools. But in practice, the implementation of the policy experienced many challenges.

Participant FGD, South Africa:

"In South Africa, we've tried to implement inclusive education because it was felt that this would be the best way to ensure that larger numbers of children with disabilities actually get into a classroom…We published a White Paper in 2001 that had a 20-year implementation plan. It was intended that we would achieve inclusive education in South Africa, at least partly, in the space of two years. However, this hasn't happened. I think a key problem is the fact that we have 380 special schools in the country, of which 22 deal specifically with children with visual impairments. Unfortunately, those 22 schools take maybe a maximum of 5,000 visually-impaired children in the country, but our statistics indicate we have more than 200,000 visually-impaired children. So the reality is, yes, there are the 22 special schools where children with visual impairments are placed ... Most of the rest of the children don't have access to any education at all. Yes, some children with visual impairments are getting mainstreamed, but they're not being included because they're not receiving a quality education in the classroom."

A participant from Tanzania reported many challenges in mainstream inclusive schools in the mainland Tanzania, while in Zanzibar, inclusive education seemed to be more developed.

Participant FGD, Tanzania:

"The problem of access to education has remained a challenge for years. Some research and statistics show we have not even enrolled 50 per cent of the children with visual impairments in schools. The government has consistently allocated low resources to inclusive education, and they know the country is running a double system. On the one hand, there are special schools and integrated schools, and, on the other hand, there are inclusive schools. Sadly, not enough resources have been allocated to cater for the entire learning/teaching needs of pupils or students of that category. It's a bit different in Zanzibar where they are implementing inclusive education and the children are commuting to and from school. They are facing a few challenges there but they are managing these and things are running smoothly."

When describing the benefits of data on children with visual impairments and children with disabilities more broadly, participants mentioned that this data could be used for the purpose of decision-making and planning; tracking transition and movement of children between schools; guiding interventions; and providing information on geographic and socio-economic disparities. Among the key weaknesses of the

current information system, participants identified incomplete, inaccurate and delayed data that was often unavailable at the national level or to the general public. In addition, the available data did not capture school attendance or academic performance of children with visual impairments and was not adequate to guide decision-making at the different levels of education systems. Both schools and local education authorities did not have the required resources or skills to collect and analyse data. FGD participants also referred to the lack and poor quality of data on children with visual impairments.

Participant FGD, Tanzania:

"One thing that we also needed to look at is the whole issue of reporting on issues related to education for children with visual impairments, because now you can come into a country and ask a responsible ministry official, how many children were enrolled last year? No information. What are the ratios between the pupils and teachers? No information. So reporting and documenting the existing practice is essential as it will mean we have the data to both understand the present situation and do things better in the future."

Educational quality

This section is based on the literature review and the FGD conducted as part of the study.

Literature review

Qualitative studies of education provision help to understand day-to-day educational realities for children with visual impairments in particular locales. However, the capacity of the systems and experiences of education described vary significantly between the settings. For example, Ceralli (2019) assessed a Sightsavers-supported inclusive education programme in three primary schools in Dakar, Senegal (see Case Study 1). Data collection methods were a document review, interviews with key stakeholders, and observation in schools and communities. He found that the classrooms were providing supportive and stimulating environments. Children with visual impairments were studying the same subjects as other children, with teachers making the necessary pedagogical adaptations. Children with visual impairments and their non-disabled peers had formed friendship groups and were supporting one another's learning. Children with visual impairments were using a range of assistive devices effectively, and children who were blind were receiving the necessary braille tuition. Classrooms were free of clutter and adequately lit, while school environments had been made more accessible and attractive. School inclusion teams had been established in the pilot schools to coordinate provision, and home-school liaison was good. Student volunteers helped children with visual impairments to travel to and from their homes.

Inaccessible classroom in Sierra Leone. © Sightsavers/Peter Caton.

Morelle (2016) describes a very different state-of-affairs in her case study of two mainstream primary schools in Klerksdorp, South Africa. Newly-enrolled students were not provided with orientation sessions to familiarise them with the physical environments of schools. Children with visual impairments frequently experienced bullying and teasing from the other children, with teachers often failing to intervene. Schools and classrooms lacked accessibility and were perceived as unsafe by the principals. Teachers had not adapted their teaching and learning assessment strategies to take into account the needs of children with visual impairments – inclusive education was just perceived as putting children with disabilities in the same class as their non-disabled peers. There was no specialised equipment in the classes and no learning support was available.

Human (2010) outlines a similar situation in her case study of a secondary school in Namibia. While some teachers adapted their classroom practice in order to take into account the specific needs of children with visual impairments, others failed to do so – for instance, they did not write in large letters on the board and relay verbally what they had written to their classes. In the classroom, children with visual impairments were often exposed to bright light, due to lack of window-blinds.[20] There was widespread bullying, with fully-sighted children even exploiting the lack of sight of children with visual impairments to steal food from their plates. Children with albinism were particularly likely to be targeted (see Box 1). Such abusive behaviour was in part attributed to the fact that the eye conditions of children with visual impairments were not explained to the other children, making the fully-sighted children "cautious and uncomfortable in their presence" (p. 83). Children with visual impairments particularly struggled in subjects with strong practical components, such as science (see Box 2). Children with visual impairments did not participate in sports, although one child was a member of the school choir. The school's physical environment was unsafe due to the stone-strewn uneven playground, loose tiles and clutter.

Brydges and Mkandawire (2017) carried out in-depth interviews with senior secondary students with visual impairments in Lagos, Nigeria, as did Asmoah (2018) in Ghana. In both studies, the students with visual impairments said they preferred to study in mainstream schools alongside their sighted peers, rather than in special schools. However, in both studies, the students also expressed concern about the lack of

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[20] Many children with low vision are photophobic. This means they cannot see properly or at all when exposed to bright light and simultaneously experience acute discomfort. Children with albinism are highly photophobic.

educational support and said they struggled in mathematics in particular.[21] In both studies, the students described highly unpleasant examples of bullying, as illustrated in the following quotations in Brydges and Mkandawire (2017) (p. 221).

Students with visual impairments, Nigeria:

"When, maybe, your writing material falls down, and when you need someone to pick it [up] for you; instead, he kicks it further away from you. And it becomes hard for you to find it. And when you tell them to help you find it, instead of helping you to get it they only laugh at you and mock you".

"We have chairs, but as soon as we are through for that day, those sighted ones that have grudges against us, they will go and look for a means to hide the chairs, so that we will not be able to see them anymore. And next day, if we are about to start the class again, we start walking around looking for chairs and all that, so it's stressful for us."

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[21] The International Council for the Education of People with Visual Impairments (ICEVI) is running a mathematics project sponsored by the Nippon Foundation that will identify effective strategies for teaching mathematics to children who are blind, and will produce an associated video training package for teachers. More information about the initiative can be found at: http://icevi.org/maths-project/

Many published studies referenced above focused on education provision for children with visual impairments enrolled in mainstream schools. It is, however, important that education provision in special schools is also considered, as large numbers of children with visual impairments continue to be educated in such institutions.

A pupil with visual impairments in Mali learning white cane skills. ©Sightsavers/Javier Acebal.

The most valuable source of information on this subject is the report *Left in the Dark*, commissioned by Section 27 [22] on the 22 special schools that enrol children with visual impairments in South Africa. The report makes depressing reading. While the teacher-student ratio should be 1:8, it is sometimes as high as 1:22, making it hard for the teachers to provide individualised support for their students, especially as there was a shortage of classroom assistants. As 12 of the 22 schools catered for children with other severe disabilities, children with visual impairments were sometimes taught in the same classes as deaf children, creating almost insuperable pedagogical challenges for the teachers.

There were shortages of assistive devices and learning materials, including braille texts. School premises were difficult and dangerous to navigate and some schools lacked secure perimeter fences as well as security-guards. House-mothers in the hostels often lacked the necessary skills – for instance, their lack of braille skills meant they were unable to help students with their homework in the evenings.

There was a shortage of social workers and occupational therapists, and, in as many as 14 of the 22 schools, students received no training in orientation and mobility due to lack of orientation and mobility instructors (see illustration).[23] It should also be noted that lack of necessary fire safety arrangements are a major concern in residential special schools such as those described in *Left in the Dark*, with four students recently dying in a fire at a school for the blind in South Africa (Phakadi, 2019). The vulnerability of students with

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[22] A public interest law centre in South Africa.

[23] Sightsavers has produced posters in English and French illustrating sighted guide techniques for children with visual impairments. These can be downloaded from: https://www.sightsavers.org/reports/2017/10/assisting-children-visually-impaired/

visual impairments, enrolled in residential institutions, to various types of abuse is also a source of extreme concern.

It should also be noted that many students enrolled in special schools and units for children who are blind in sub-Saharan Africa either have low vision or may not even be visually impaired. Among other things, this means they are often taught braille, even though they should be reading and writing print. Tumwesigye *et al* (2009) in their survey of such schools/units in Kenya, Malawi, Tanzania and Uganda, found that 361 (34%) of the children surveyed had a visual acuity of ≥6/60, of whom 120 had normal vision (≥6/18). The authors of the study could not conclusively identify the causes of inappropriate educational placement, but possible reasons were poor record-keeping and the fact that 54% of the students were not examined by an ophthalmologist prior to admission. It is also possible that children with albinism were enrolled in these institutions out of fears for their safety.

FGD data

Participants in the FGD conducted by Sightsavers also talked about multiple challenges affecting quality of education for children with visual impairments, particularly in mainstream schools. They referred to inadequate financial resources, the lack of education materials and assistive devices, inaccessible school infrastructure and high student to teacher ratio:

"There is a shortage of necessary resources in mainstream schools, except where there are programmes supported by an international NGO, a civil society organisation or one of the UN agencies, like UNICEF" (participant FGD, Ghana).

Another participant explained that due to limited capacities and resources available to mainstream schools, these schools tended to focus on children with less severe disabilities, those who could be more independent and did not require an intense individual support:

"The schools available … do not have sufficient capacity to enrol …out-of-school children. Inclusive initiatives … are focusing on those children with mild levels of disability, especially those with low vision who can travel independently, who don't need braille, who don't need a specialised teaching approach. Only children like these are being included." (participant FGD, Tanzania).

A third participant said that mainstream schools struggled to provide the necessary support to children with visual impairments. Mainstream schools lacked the necessary resources and expertise and as a result both the schools and the parents were reluctant to enrol children with visual impairments in mainstream schools:

"Very few children with visual impairments are going to mainstream schools. Number one, parents are reluctant to enrol their children in mainstream schools if they're not going to get the necessary support. Number two, because those 22

(participant FGD, South Africa).

The above evidence indicates that children with visual impairments in mainstream schools across sub-Saharan Africa often receive an education of unacceptably poor quality, and this conclusion is reinforced by the quantitative and qualitative data and information that was provided by the 11 Ministries of Education (see Appendix 1). Inevitably, poor quality education provision has a significant impact on educational outcomes – the next subject for discussion.

How it should be: Mafoune, an eleven-year-old pupil with low vision at a primary school in Mali, with her classmates. The project is supported by USAID. Photo: © Sightsavers/Javier Acebal.

Box 1: Education provision for children with albinism

Albinism is an inherited condition resulting in lack of black pigment in the hair, skin and eyes. Usually, children with albinism are born to parents with typical black pigmentation. Sometimes only one child in a family has albinism and sometimes there are more. Albinism is always associated with poor eye-sight from birth. Children with albinism have low vision and are photophobic (very sensitive to bright light). The prevalence rate has been estimated as 1/5,000-1/15,000, indicating tens of thousands of children in Southern African countries are affected (Franklin *et al*, 2018).

In a number of sub-Saharan African countries, children with albinism experience high levels of stigma and discrimination and even life-threatening physical violence due to myths about the condition (Baker *et al*, 2010). This means parents may be unwilling to send their children to school due to fears they will be abused or even attacked, either *en route* or in the school itself. Parents may also have internalised myths about albinism and therefore doubt if their children are 'worth educating' (Franklin *et al*, 2018). Children with albinism themselves are often unaware of the causes of their condition, heightening their distress and anxiety (Lund, 2001; Lund & Gaigher, 2002).

In school, children with albinism are not only often victims of teasing and bullying, but denied the necessary learning opportunities (Lynch *et al*, 2014). For instance, they may be unable to see what the teacher has written on the blackboard because they are sitting too far from the blackboard, because the teacher has not written largely and clearly on the blackboard, and/or because they do not have spectacles. Lacking spectacles, they also struggle to read books, especially as they are unlikely to have large-print books. They may also be unable to function effectively in the classroom due to bright light. Outside the classroom, children with albinism also often lack the sunglasses, wide-brimmed hats, long-sleeved shirts and sun-screen protection, leading to acute discomfort, often irreparable skin-damage, and significantly increased risk of developing skin cancer later in life.

Pat Lund, Boniface Massah and Paul Lynch have produced an accessible teachers' guide identifying ways of supporting children with albinism inside and outside the classroom. It is available in both English and French and can be downloaded from:

https://www.sightsavers.org/reports/2019/01/albinism-guide/

> **Box 2: Barriers to curriculum access**
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> Habulezi *et al* (2017) carried out an important investigation into the reasons for the unsatisfactory performance of students with visual impairments in science subjects in Botswana. For instance, only nine braille users took the secondary science examination in 2016, and there was a 100% failure rate. In previous years (2010-2015), the pass rate has never been higher than 33%.
>
> They concluded that a number of factors were responsible for the students' difficulties:
>
> - The fact that science is often presented visually (in the forms of tables, graphs, diagrams and illustrations)
>
> - Inappropriate pedagogical practices – for instance, the teachers did not always speak clearly and relay what they had written on the board to their classes
>
> - Lack of access of students to tactile materials and graphics in science lessons that would compensate for the visual nature of the subject
>
> - Lack of provision of braille notes
>
> - Shortage of specialist science teachers in schools and lack of learning support workers, combined with large class sizes
>
> - Pre-conceptions of teachers that students with visual impairments cannot study science
>
> - Exclusion of students with visual impairments from practical experiments
>
> Habulezi *et al* (2017) conclude that while science as a subject poses certain challenges, students with visual impairments can succeed in the subject, as long as they are provided with the necessary types and levels of support.

Education outcomes

Literature review

Analysing census data from 13 sub-Saharan African countries, Wodon *et al* (2019) concluded that literacy rates for children with visual impairments appear to have increased significantly in recent decades, particularly for girls with visual impairments. The number of children with visual impairments identified as literate by household members had increased by 8.7% for boys with visual impairments and a striking 23.4% for girls with visual impairments. Literacy rates were now similar among boys and girls with visual

impairments. However, Wodon *et al* also found that non-disabled children had made similar progress over this time period and therefore the 'disability gap' between children with visual impairments and their non-disabled peers had remained "of an order of four percentage points, although this differs depending on the region and gender being considered" (p. 13). Analysing data from ten francophone countries, Wodon *et al* (2018, 2019) also assessed the performance of Grade 6 children reporting difficulties with seeing in the PASEC tests (that measure proficiency in reading and mathematics). In nine of the ten countries, the average scores of these children was lower for mathematics than for children reporting no difficulties with seeing. In eight of the ten countries, the average scores of these children were lower for reading.

Qualitative analyses also indicate that children with visual impairments particularly struggle to achieve their potential in 'hands on' and/or 'visually based' subjects, such as mathematics, science and agriculture (Human 2010; Brydges & Mkandawire, 2017; Habulezi *et al,* 2017; Asamoah *et al*, 2018). Although there is a lack of hard data about this, Habulezi *et al* reported that there was a 100% failure rate for the nine braille-users entered from the 2016 secondary science examination in Botswana (see Box 2 on page 31).

EMIS data

The 11 Ministries of Education surveyed in this study do not routinely collect data on education outcomes through their EMIS. The data collected on transition of children with visual impairments from primary to secondary education was therefore used as a proxy for education outcome data.

Six countries provided data on total number of children in both primary and secondary education. As Table 3 shows, the data suggests that a large proportion of children with visual impairments in four of these six countries appear not to be transiting from primary to secondary education. While a large proportion of students with visual impairments are enrolled in secondary schools in Ghana and Zambia (47.7% and 30% respectively), the percentages are much lower for Kenya (5.2%), Liberia (13.8%), Malawi (8.5%), and Uganda (9.2%). However, the data should be treated with considerable caution (see pages 21-23 of this report). The primary and secondary data from Ghana only includes students who are blind and enrolled in special schools. The primary and secondary education data from Zambia only includes students in special and integrated schools, as is the case for secondary data from Kenya. It is plausible that significant numbers of children in Kenya and Zambia are enrolling in mainstream secondary schools when they graduate from special/integrated primary schools.

Table 3: Number of children with visual impairments enrolled in primary and secondary education according to EMIS data provided by Ministries of Education						
	Ghana	Kenya	Liberia	Malawi	Uganda	Zambia
Primary education	347	12,316	917	35,632	36,792	7,304
Secondary education	316	680	147	3,326	3,709	3,137
Total	663	12,996	1,064	38,958	40,501	10,441
% of students in secondary education	47.7	5.2	13.8	8.5	9.2	30

Unfortunately, enrolment data for secondary education was not disaggregated by sex for Malawi and Kenya – but in the other four countries, significantly fewer girls than boys were reported as enrolling in secondary education (41.1% in Ghana, 44.9% in Liberia, 43.25% in Uganda and 43.12% in Zambia).

Finally, data from Uganda showed that that disproportionate number of children with visual impairments were failing to sit terminal examinations at both primary and secondary levels:

- 39,792 children with visual impairments were recorded as enrolled in primary education, but only 388 took the Primary Leaving Exam.

- 3,709 children with visual impairments were recorded as enrolled in secondary education, but only 135 took the Uganda Certificate of Education (at the end of lower secondary school) and 71 took the Uganda Advanced Certificate of Education (at the end of upper secondary school).[24] [25]

Seeing the bigger picture

Educational outcomes not only refer to test and examination results and levels of literacy and numeracy, but broader developmental outcomes.

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[24] Unfortunately these data were not disaggregated by sex.

[25] The alternative explanation is that these children are being disbarred from these examinations. Further investigation of the reasons for such low numbers is necessary.

Lack of access of children with visual impairments in sub-Saharan Africa to training in subjects such as orientation and mobility and daily living skills inevitably makes it harder for them to lead meaningful, productive and independent lives.

Negative school experiences can also have a long-term impact on the psycho-social wellbeing of youths and adults with visual impairments. In her qualitative analysis of the lived experiences of students with visual impairments in two universities in South Africa, Lourens (2015) found that students who had been bullied, ridiculed and ignored in mainstream schools were distrustful of others, had low self-esteem, and found it hard to make friends. By contrast, students who had been educated in special schools initially found it hard to interact with fully-sighted students and also found the less routinised and enclosed environment of universities physically and socially challenging. In short, these students had become somewhat institutionalised. However, over time, the special school students managed to establish friendships with their fully sighted peers. By contrast, "very few of those students who came from a mainstream school…made any non-disabled friends during their tertiary years" (p. 166). Students from special schools were also more used to receiving accommodations (e.g. learning resources, extra-time in examinations) than students from mainstream schools, so were more willing to ask for these accommodations when at university.[26]

ACCESS TO SUPPORT AND ASSISTIVE TECHNOLOGY

Support

The introduction to this report outlined the learning support needs of children with visual impairments, as articulated by the United Nations Convention on the Rights of People with Disabilities.

Unfortunately, children with visual impairments often not only lack the necessary classroom-based support (see previous section), but also the necessary additional learning support.

Availability and distribution of specialist teachers

Data provided by the Ministries of Education indicates great variations between countries in terms of quantity and quality of specialist teachers of children with visual impairments. Nine out of 11 Ministries of Education participating in the survey said that they had specialist teachers for children with visual impairments in their countries. Liberia said that they did not have such cadre and Sierra Leone provided no response. Data on the number of specialist teachers for children with visual impairments were provided by five countries (Kenya, Zambia, Uganda, Malawi and Mali) and the number varied from 76 teachers in Malawi to 1,865 in Zambia. In countries with large numbers of specialist teachers, the majority of these teachers tended to be based in special schools and units. In Senegal, all specialist teachers for children with visual impairments were based in the single special school for children who are blind. Unsurprisingly, this

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[26] It should be noted that this is only one study, and its findings are therefore not generalisable.

availability and distribution of specialist teachers raises concerns about levels of access to specialist support – for instance braille tuition – mainstream schools.

Eight out of 11 countries said that training institutions provided specialist training for teachers of children with visual impairments. Such training was not available in Mali, Senegal and Liberia.

Ten countries (all except Sierra Leone) responded to the question on the overall quantity and quality of human resources available to support children with visual impairments. Out of ten countries, only Uganda said that they had an adequate number of specialist teachers, but also noted the quality of these teachers needed to improve. Six countries said that they required improvements in both quantity and quality of specialist teachers and three countries said that their current system of HR support was inadequate.

Orientation and mobility instructors

The Ministries of Education also expressed concerns about the shortage of orientation and mobility instructors, as well as their lack of professional competence. These instructors – like specialist teachers of children with visual impairments – are often based in special schools and units, raising concerns about levels of access to orientation and mobility instruction for children with visual impairments enrolled in mainstream schools.

Blind pupil in Mali reading braille. © Sightsavers/Javier Acebal.

In Kenya, specialist teachers of children with visual impairments, rather than orientation and mobility specialists, provide orientation and mobility (O&M) instruction – potentially a pragmatic solution for resource-poor countries that cannot afford to employ cadres of orientation and mobility specialists, as long as good quality O&M instruction is provided. Overall, eight countries said that they had O&M professionals in their country (the cadre is not available in Kenya, Senegal and Malawi). However, the data on the number of O&M specialists available was provided only by three countries — Liberia, Mali and Zambia, who reported 3, 16 and 96 O&M professionals, respectively. Out of eight countries that reported O&M professionals in their country, seven responded to the question on the quantity and quality of the O&M support, all of them said this provision needed to be significantly improved.

Rehabilitation specialists

The ministries expressed similar concerns about the lack of rehabilitation specialists providing training in areas such as daily living skills and communication skills. Although eight countries participating in the survey said that they had rehabilitation professionals to support children with visual impairments, only one country (Liberia) reported the number of specialists available, and that number was one. Out of eight ministries that replied to the question about the quantity and quality of rehabilitation support available in their countries, four regarded their system as inadequate and four said the system required significant improvements in both quantity and quality. Case Study 3 in this report describes a community-based early childhood development programme in Malawi that could potentially be scaled-up in Malawi and elsewhere.

Some Ministries of Education said that they employed small numbers of itinerant teachers to provide outreach services for children with visual impairments in mainstream schools. Lynch *et al* (2009, 2011a, 2011b) investigated the work of itinerant teachers in Malawi, Kenya and Uganda, and, while recognising they provided valuable services, raised concerns about the quality of braille literacy support. In particular, they observed:

- The teachers did not have always have an adequate grasp of the braille code – often their knowledge did not extend much beyond the braille alphabet, and sometimes they were not even familiar with the braille alphabet itself.

- Due to difficult travelling conditions, large/widely dispersed caseloads and additional responsibilities,[27] the itinerant teachers were sometimes only able to visit the children less than once week – completely inadequate for children with intense support needs.

- There was often a shortage of braille books and equipment in schools, which not only limited curricular access for braille users, but deprived them of opportunities to practice their braille reading skills.

- The itinerant teachers sometimes lacked the pedagogical skills necessary for teaching braille reading and writing.

Visual screening/assessment services

Ten countries responded to the question about availability and quality of visual screening, assessment and treatment services for children with visual impairments. Two countries (Sierra Leone and Malawi) said that

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[27] In some cases, the itinerant teachers were also classroom teachers. They were therefore only able to provide itinerant support two days every week and, when away from their schools, had to identify colleagues to take their classes.

their services were adequate in terms of availability but required improvement in terms of quality. The other countries said the services needed to be improved in terms of availability and quality.

Analysing data from ten francophone sub-Saharan African countries, Wodon *et al* (2019) found that less than 5% of primary school teachers reported that their students benefited from seeing and hearing tests, although slightly more than 25% reported that medical check-ups were in place in their schools. It is therefore likely that there are significant numbers of students with visual impairments in schools in sub-Saharan Africa whose difficulties with seeing have not been identified and therefore not received the necessary medical treatment, assistive devices and adaptations. Eye health services in sub-Saharan Africa are further discussed on pages 36 and 39 and in Case Study 5 of this report.

Assistive technology

A child who is blind in Sierra Leone exploring a tactile globe. The project is supported by the European Union. © Sightsavers/Peter Caton.

The introduction to this report identified some of the assistive technology requirements of children with disabilities. Appendix 2 provides further information on this subject.

Overall access to assistive devices

Data provided by the Ministries of Education indicates significant differences between countries. According to the Ministry of Education in Liberia, the only assistive devices available are a small number of writing frames with styluses, white canes, and 15 Perkins Braillers for the entire country. Other ministries reported a greater variety of assistive devices, but noted these devices were often in short supply because they were expensive and often needed

to be imported. All the ministries expressed concern about the shortage of braille reading materials, and large-print texts were rarely available for students with low vision.[28]

These same concerns are expressed in studies of education provision in Botswana (Habulezi & Phasha, 2012; Habulezi *et al*, 2017), Ghana (Asamoah *et al*, 2018), Namibia (Human, 2010), Nigeria (Brydges & Mkandawire, 2017), Malawi (Lynch *et al*, 2009), and South Africa (Sukhraj-Ely, 2008; Fish-Hodgson & Khumalo, 2015; Morelle, 2016).

Availability of spectacles

Ministries of Education also expressed concern about shortages of spectacles. Among the countries who responded to the question about availability of spectacles, only Zambia described this provision as adequate in both quantity and quality. In Malawi, the availability of spectacles was adequate in quantity but not in quality. Four countries required improvements in both quantity and quality of spectacles and in three countries the system was described as inadequate. These concerns are echoed in a study of an integrated school in Malawi that found "nearly 63 per cent of the students (with refractive errors) (20 of 31) had never worn spectacles, even though they needed them" (Kaphle *et al*, 2015, p. 373). Similarly, a study of school children in Durban, South Africa, found that although there was "an overall prevalence of 4.0 per cent myopia[29] and 2.6 per cent hyperopia,[30] only 19 per cent of the children requiring spectacles were wearing them or had had an eye examination" (Naidoo, 2007, p. 418).

Access to ICT

Finally, the Ministries of Education reported that children with visual impairments had little or no access to Information and Communication Technology (ICT). ICT can be a valuable tool for students with visual impairments (see Box 3). Unfortunately, ICT is still prohibitively expensive in many educational contexts in sub-Saharan Africa, given the capitation grant[31] for students can be as low as US$10 per head per annum (Ngowi, 2015). Intermittent electricity supply and lack of infrastructure for maintaining and repairing ICT creates further challenges. However, ICT is increasingly being used by students with visual impairments in

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[28] Pikoli (2019) reports that the right of braille users in schools to a full range of braille textbooks has been legally established in South Africa. However, civil society will need to provide ongoing monitoring in order to ensure this right is implemented.

[29] Myopia, also known as nearsightedness or short-sightedness, is a common type of refractive error where objects that are near are clearer than distant objects. Among other things, myopia, unless corrected, prevents students reading what has been written on the blackboard or, at least, makes it hard for them to do so.

[30] Hyperopia, also known as farsightedness, is a common type of refractive error where distant objects may be seen more clearly than objects that are near. Amongst other things, hyperopia, unless corrected, prevents students reading print or, at least, makes it hard for them to do so.

[31] The amount of money given to a school by the government based on the number of students enrolled.

tertiary education (Lourens, 2015; Nasiforo, 2015), and, as it becomes more affordable and available, will increasingly be used in schools, particularly comparatively well-resourced schools in urban areas.

Box 3: the potential of ICT

ICT is potentially a valuable tool for students with visual impairments.

Students with low vision can find it easier to read and write using a computer screen. For instance, they can expand the print so it is the right size for them and use their preferred font. Computer screens also provide good contrast, high quality resolution and picture-steadiness. Some students with low vision find print easier to read if certain colour combinations are used, and again this is possible on the computer. Screen-glare can also be reduced through using anti-glare filters or by adjusting the on-screen colours. Once these students have finished typing, they can print off their work in their preferred print size, font, and colour-combination (assuming they have access to a colour printer).

Students who are blind can also benefit from ICT.

If they have text-to-speech software (like screen-readers) on their computers, they can listen to what they have just typed and make any necessary changes. (Some versions of this software are prohibitively expensive, but others can be downloaded free of charge.) These students can also listen to texts that they have downloaded from the internet or stored on USB sticks. If they have access to a scanner, they can scan texts and then listen to them. Once they have completed their work, they can print it out for their teachers and even produce braille copies for themselves (if they have access to a braille embosser).

Refreshable braille displays are particularly useful for braille users, as they provide a readable braille display of the text on a computer screen.

ICT is also useful in other ways. For instance, through accessing the internet, students with visual impairments – along with other students – can keep in touch with others and stay informed about world events.

The Daisy Consortium is an international non-profit membership organisation promoting access to information and technology for people with visual impairments. More information on the organisation can be downloaded from:

https://daisy.org/

EDUCATION SYSTEMS, SERVICES AND POLICIES

In order for children to access the necessary classroom provision, assistive technology and learning support described in the previous sections of the report, appropriate systems and policies need to be in place.

Systems and services

Eye health services

There should be effective school eye health services that ensure that children experiencing difficulties with seeing are swiftly identified and referred for assessment. Children identified as having visual impairments should then receive the clinical care necessary, such as surgery, treatment and medication. If required, they should receive customised spectacles and other optical low-vision aids (for instance, hand-held magnifiers).[32] Once children with visual impairments have been assessed, eye health and education services should collaborate closely to provide 'joined up' services. Specifically, eye health and education personnel should collectively identify the educational requirements of children with visual impairments, given their eye conditions. Do they require assistive devices? If so, which devices are most appropriate? Do they need to learn to read and write braille? Do they require large-print reading material? Where should they sit in the class? Should they be protected from bright light? Will they require orientation and mobility training? What modifications should teachers make to their pedagogical practices? The child's parents should be involved in these discussions and the views of the children must also be taken into account.

Unfortunately, all the evidence provided by the Ministries of Education in sub-Saharan Africa indicates joined up, multi-faceted eye health services are rarely available and, where they exist, can usually only be found in urban areas, especially in comparatively prosperous and urbanised sub-Saharan African countries.[33]

Support and advisory services

As already discussed, other necessary services tend to be of poor quality or even non-existent. For instance, a shortage of trained instructors often means children with visual impairments receive little or no mobility

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[32] Children with uncorrected refractive error also require customised spectacles.

[33] Kenya has a national network of Educational Assessment and Resource Centres (EARCs). EARCs can potentially play a vital role in ensuring that children with visual impairments receive functional assessments and, based on these assessments, their teachers and parents receive necessary guidance. EARCs can also refer children with visual impairments to eye health services for further assessment, treatment, refraction, and so on. However, according to the Ministry of Education, further investment is needed in this system. For instance, EARCs sometimes lack basic equipment such as Snellen Charts and pen-lights. At present, Sightsavers is working with the Ministry of Education to strengthen this system for all children with disabilities, including children with visual impairments.

and orientation instruction unless they are enrolled in special schools. They are also unlikely to receive training in other key areas, such as daily living skills, communication skills and braille literacy. There is also a need for well-funded systems for procuring, producing and distributing assistive technology and braille and large print reading materials, but unfortunately such systems are often underfunded, and therefore struggle to meet demand.

Teacher development and oversight

Teachers need high quality pre-service training and, later on, continuous professional development if they are to meet the needs of children with disabilities, including children with visual impairments. Unfortunately, student teachers in Cameroon, Liberia, Nigeria, Senegal, Sierra Leone and Zambia often do not even receive a basic orientation on the education of children with visual impairments, according to information provided by the respective Ministries of Education – although, encouragingly, the Ministry of Education in Sierra Leone reports that its teacher training curriculum is at present being revised. The situation is reportedly better in Kenya, Malawi, Mali and Uganda, and, again encouragingly, the Ministry of Education in Kenya believes that pre-service training will improve once the teacher-training curriculum is aligned with the new Competency Based Curriculum. According to most of the Ministries of Education contacted for this report, practising teachers have little or no access to continuous professional development (CPD), unless they are willing to pay for it or it is funded by an international development agency.

Classroom teachers require external support and supervision, especially classroom teachers in mainstream schools encountering students with visual impairments for the first time. However, such support and supervision is often lacking. Unlike other countries, South Africa has established a system of District-based Support Teams (DBSTs) responsible for supporting schools that have included children with disabilities. However, in her case study of two mainstream primary schools in Klerksdorp, Morelle (2016) reported that the local DBST was unable to provide any practical assistance as it lacked the necessary visual impairment expertise.[34] Sukhraj-Ely (2008) reports similar problems. Institutional levels support teams (ILSTs) have also been set up within the schools themselves, but these too lack capacity, according to the above authors.

Education management information systems

Education management information systems (EMISs) can potentially play a key part in collecting data on educational enrolment, transition and outcomes for children with visual impairments and other children with disabilities. Having analysed EMIS data, ministries can then intervene to strengthen education systems and improve educational provision. It is encouraging that the majority of the Ministries of Education contacted collect primary and secondary enrolment data for children with visual impairments,

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[34] Some states in Nigeria now have Inclusive Education Desk Officers. For instance, Kaduna State has 23 such officers, one per district, along with School Support Officers. This provides the potential basis for an effective system of outreach support for mainstream schools.

disaggregated by sex and severity of impairment. Ministries of Education in a minority of countries also collect examination data for these children, again disaggregated by sex and severity of impairment. However, it is concerning that children with visual impairments not enrolled in special schools or units/centres are sometimes not included in the data – an indication of their broader marginalisation within education systems. Several of the ministries contacted also stressed the lack of reliability of the data provided.[35] Fortunately, EMISs in sub-Saharan Africa are likely to be significantly strengthened over the next decade, given the emphasis in the Sustainable Development Goals on strengthening national data collection systems and the increased use of the Washington Group Questions to assess the prevalence of disability.[36]

Special schools

Finally, it should be noted that many countries in sub-Saharan Africa have extensive systems of special schooling for children with visual impairments. For instance, Uganda has 37 special primary schools and 20 special secondary schools, Malawi has 12 special schools, and South Africa has 22 (although 12 of these also cater for children with other impairments). These institutional arrangements raise a number of concerns:

- The evidence indicates that children with visual impairments enrolled in these institutions generally have much greater access to specialist assistance (including braille tuition, orientation and mobility instruction) than their peers in mainstream schools – although it should also be noted that this assistance is often insufficient and of poor quality.

- These institutions tend to be based in urban areas, making it difficult for children from rural areas to access these institutions.

- Many of these institutions are residential, raising concerns about the safety and wellbeing of the students, and their capacity to reintegrate into their communities, post-education.

- They sometimes charge fees for food and accommodation, making the schools unaffordable for children from disadvantaged socio-economic backgrounds.

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[35] It was beyond the scope of this report to analyse Ministry of Education data collection systems and consequently asses their effectiveness.

[36] UNICEF (2014) have produced a useful guide, specifying what data on disability should be collected by an EMIS, and UNESCO Institute of Statistics (2019) have produced a guide outlining how such data can be collected through an EMIS.

- Students in special schools, and even units, have no day-to-day contact with their fully-sighted peers, perpetuating the broader social marginalisation of people with disabilities.

- Such segregation is also contrary to international agreements promoting inclusive education – such as the Salamanca Declaration on Special Needs Education (1994), the United Nations Convention on the Rights of Children with Disabilities (2006) and the 2030 Agenda for Sustainable Development (2015). It is also contrary to domestic legislation and policies affirming the rights of children with disabilities to inclusive education.[37]

In a number of countries, significant numbers of children with visual impairments attend integrated schools – mainstream schools with units/resource centres attached. Theoretically, children with visual impairments can enjoy the 'best of both worlds' in these institutions. Early in their school careers, they can spend a limited amount of time learning specific skills and receiving learning support in the centres/units, while spending the majority of their time in mainstream classrooms. Later on, these students can spend the entire school day in mainstream schools, learning alongside their fully-sighted peers. However, unless this provision is carefully monitored, there is a danger that children enrolled in these units/centres will spend the majority of or even the entire school-day studying apart from their peers (Wapling, 2010).

Policies

A number of sub-Saharan African countries have complex policy frameworks[38] affirming the rights of children with disabilities to receive a full course of good quality education in mainstream schools. These policies are aligned with relevant international agreements. For instance, the Government of Nigeria has not only signed and ratified United Nations Convention on the Rights of People with Disabilities, but produced/passed:

- a National Policy on Education (1997; updated in 2004) requiring all children to completely fully cycle of basic education.

- A National Policy on Special Needs in Education (2015) committing the government to zero rejection from education systems of any children.

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[37] However, if Ministries of Education decide to phase out special schools or at least reduce their number, these ministries need to ensure that good quality inclusive education provision is available in mainstream schools, including high-quality braille support for children who are blind – a point made eloquently by Sukhraj-Ely (2008).

[38] However, these frameworks are not necessarily complete and may also contain internal contradictions, as will be discussed in this section.

- a National Disability Rights Law (2019) which, among other things, commits the government to making all public buildings accessible for children with disabilities within the next five years.

Anecdotal evidence from education stakeholders in sub-Saharan Africa indicates that significantly more children with disabilities are going to mainstream schools than was the case in the past. However, as already discussed, the evidence also indicates that large numbers of children with disabilities continue to be excluded from education and, if enrolled in education, to be receiving an education of sub-standard quality. Why is this the case, given the existence of elaborate policy frameworks which are supportive of inclusive education?

Challenges facing policy makers and implementers

Sukhraj-Ely's (2008) multi-level case study of the implementation of the inclusive education policy in South Africa illustrates some of the challenges faced by policy makers and implementers across sub-Saharan Africa.

According to Sukhraj-Ely, the Ministry of Education released Education White Paper 6 (EWP6) in June 2006. EWP6 outlined the government's plans for establishing an education system in South Africa that would meet the needs of all learners. It was intended that EWP6 would be implemented over 20 years and eventually cover 500 primary schools. However, the initial focus was 20 mainstream schools, designated as Field Test Full Service Schools (FTFSSs) which would include children with diverse impairments. FTFSSs would receive outreach support from neighbouring special schools, designated as Special Schools as Resource Centres (SSRCs). SSRCs would also continue to take responsibility for the education of some children with disabilities, but these would be children requiring "high intensity support" (Sukhraj-Ely, 2008, p. 155). SSRCs, like FTFSSs, were expected to enrol children with diverse impairments. Institutional level support teams (ILSTs) would be set up in the FSTSs to support the inclusion of learners with disabilities, with District-based Support Teams (DBSTs) providing further assistance.

Sukhraj-Ely commended EWP6's commitment to inclusive education responsive to the specific, impairment-related needs of children with visual impairments. She also praised the pragmatism of EWP6, as it sought to achieve change gradually through strengthening existing education systems. However, when she carried out field-visits to selected SSRCs and FTSSs, she noted significant implementation difficulties. She attributed these difficulties to various factors, including:

- The failure of central government to establish the costs of implementing EWP6 and allocate sufficient funds to this process – for instance, for training and recruiting staff, procuring necessary resources, and adapting educational infrastructure. Instead, financially hard-pressed provincial governments were expected to cover many of the costs of the new programme, along with the donor community. As Sukhraj-Ely observes, "One cannot help but notice that reliance on donor funding still entrenches disability issues, needs and rights within a charity discourse" (p. 157).

- The lack of capacity of SSRCs to support children with all types of impairments, as the SSRCs lacked the necessary multi-disability expertise, teaching and learning resources and (in some cases) accessible infrastructure. For the same reasons, the SSRCs lacked the capacity to provide support for the FTSSs (which were also supposed to enrol children with diverse impairments). DBSTs similarly lacked the necessary multi-disability expertise to support FTSSs.

- The inability of SSRCs to both educate children with disabilities and provide outreach services for FTSSs, given, for instance, staff shortages in SSRCs.

- The failure of EWP6 to recognise that educating children with certain impairments together in the same classroom is potentially problematic – for instance, Sukhraj-Ely pointed out that children with Attention Deficit Hyperactivity Disorder (ADHD) were likely to be distracted by the sound of a Perkins Brailler used by a learner with a visual impairment.

- The failure of EWP6 to define what it meant by children with severe disabilities (on one hand) and moderate and mild disabilities (on the other hand), even though the former were supposed to be educated in SSRCs and the latter in FTSSs.

- The lack of consistency between EWP6 and enacted laws, and the lack of legislative back-up for EWP6 that would enable EWP6 to overrule these laws. For instance, EWP6 says public schools designated as FTSSs are obliged to enrol children with disabilities, but existing legislation says School Governing Bodies have the final say on admissions. Sukhraj-Ely (p. 159) points out, "As legislation overrides policy, this means that EWP6 is unenforceable…"

- The lack of specificity in EWP6 about the rights of children with disabilities, including children with visual impairments, to services, resources and educational-placements.

- The lack of priority attached by EWP6 to secondary education, even though secondary education, as well as primary education, urgently required investment.

- Insufficient and inappropriate investments in SSRCs, FTSSs and DBSTs due to lack of funds, poor planning and the vagueness of EWP6 (see above).

All over sub-Saharan Africa, disabled persons' organisations are expressing frustration about the lack of inclusive education provision, despite the existence of policy frameworks expressing the

commitment of national governments to inclusive education. Sukhraj-Ely's analysis identifies common factors causing this state of affairs, namely:

- Policies that are insufficiently explicit, specific or comprehensive

- Policies lacking legislative back-up, enforcement mechanisms or SMART indicators for measuring implementation

- Insufficient and inappropriate investments in inclusive education initiatives[39]

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[39] Another factor is ineffective dissemination of policies that means a) policy-implementers are not aware of their responsibilities, and b) beneficiaries are not aware of their rights – see, for instance, Grimes *et al*, 2013; Mattingly & Ratsifandrihamanana, 2016; Omona *et al*, 2017.

The goal of the Marrakesh Treaty is to end the 'book famine' experienced across the world by people who are blind, have low vision, or are otherwise print-disabled. These individuals have little or no access to many published materials because they are only available in print (usually small print) and copyright laws prevent people accessing soft copies of the texts.

The Marrakesh Treaty obliges governments to waive the copyright law for people who are print-disabled. The treaty also permits the import and export of accessible versions of books and other copyrighted works, again without copyright holder permission.

So far, 29 governments in sub-Saharan Africa have signed the Marrakesh Treaty, of which a further 13 have ratified the treaty. It is expected that many other countries in the region will sign/ ratify the treaty over the next few years.

After the treaty has been signed/ratified, the next stage is implementation. However, a number of challenges exist:

- In some countries, the Marrakesh Treaty has to be incorporated into national legislation before implementation can be considered.

- There is some resistance within the publishing industry to the treaty.

- Some governments, including signatories to the treaty, do not appreciate the full ramifications of the treaty and/or are not sure how to operationalise it.

Despite these challenges, students with visual impairments across sub-Saharan Africa should eventually have much greater access to a wide variety of texts in diverse formats thanks to the treaty. World Blind Union has produced a guide to the Marrakesh Treaty downloadable from:

http://www.worldblindunion.org/English/our-work/our-priorities/Pages/WBU-Guide-to-the-Marrakesh-Treaty.aspx

LOOKING TO THE FUTURE: FIVE EXAMPLES OF GOOD PRACTICE…

CASE STUDY 1: INCLUSIVE EDUCATION FOR CHILDREN WITH VISUAL IMPAIRMENTS IN SENEGAL

The education system in Senegal faces significant challenges. An estimated 47% of school-aged children are not in education, and, in 2013, 66% of children with disabilities aged seven to 16 years reported that they had never attended or had dropped out of school (Ceralli, 2019).

For the last ten years, Sightsavers, with financial support from Irish Aid, has been working with the Ministry of Education in Senegal to include children with visual impairments (and other children with disabilities) in primary schools in and around Dakar City. At present, 241 children benefit from the project – 125 girls and 116 boys.

The project has sought to utilise existing systems and structures to build networks of support for children with disabilities through various initiatives.

Mobilising communities

School Management Committees (SMCs), Disabled People's Organisations (DPOs) and the Association of Parents of Children with Disabilities (APCD) are responsible for mobilising community support for inclusive education. Selected teachers from the pilot schools also visit homes to discuss the progress of children with disabilities with their parents. Fully-sighted children accompany children with visual impairments to and from school to ensure their safety.

Integrating education and health services

SMCs, DPOs and APCD (see above) are also responsible for identifying children with visual impairments in the community and referring them to health professionals for screening. Screening is also carried out in schools through the National Eye Health Programme. All students with disabilities in the pilot schools have received medical consultations, with recommendations for their care and support. They have also received necessary treatment and assistive devices.

Promoting universal design

In order to make school environments more conducive for children with visual impairments, ramps have been constructed and toilets made more accessible. In addition, the schools have made their environments more welcoming, clean, orderly, cheerful and colourful, in line with universal design principles.

Promoting child-friendly teaching and learning

The project sought to make teaching and learning more tailored to the specific needs of children with disabilities. Accordingly, the project has encouraged:

- differentiated teaching and learning where teachers use different approaches to teach pupils with different abilities and needs, and adapt their teaching styles accordingly.

- cooperative learning that responds to the diverse needs of children, promotes respect for students' differences, and encourages collaboration and interdependence.

Individual education plans (IEPs) ensure students with disabilities receive individualised support and their progress is monitored.

Mobilising teachers

Within each school, Inclusion Champions (two or three volunteer teachers, at least one of whom is female) lead the inclusion process, while larger School Inclusion Teams coordinate IE provision.

All staff have received training in inclusive education, using comprehensive training manuals and modules validated by the ministry. Teachers have also received additional training in braille.

Strengthening school oversight

Inspectors monitor the pilot schools using tools developed by the project, including quality standards and evaluation questionnaires and grids.

In 2018, an independent consultant carried out a comprehensive review of the project, along with a similar project managed by Humanity & Inclusion. Data-collection processes included a document review, interviews with a range of stakeholders, and school visits and classroom observations.

Reflecting on both projects, the review concluded:

- Children with disabilities are no longer ignored or hidden away. They are consulted, referred to health and social services, and receive necessary care and support.

- Where possible, children access school. Their attendance-rates are improving, particularly among girls, and they are making sustained progress. Children are acquiring more self-confidence and self-esteem. They are also more socially active, both inside and outside school.

- Families understand better their children's needs. Parents are more involved in their children's education and are satisfied with their progress.

- Schools are more welcoming in terms of safety, cleanliness and food provision. School environments are more accessible because of ramps, accessible toilets and other infrastructure adaptations.

- Teachers are better trained, more motivated, and tend to work more closely together.

- The education system, including school management, inspections, and the Board of Elementary Education (BEE), is better equipped to supervise, monitor and evaluate children's learning and support.

- Local and regional authorities are increasingly committed to inclusive education, and multi-sectoral collaboration around inclusive education is developing.

Drawing on learning from the programme, Sightsavers has produced a guide on inclusive education children with visual impairments that can be downloaded from:

https://www.sightsavers.org/reports/2018/09/inclusive-teaching-and-learning-for-children-with-visual-impairments/

Mbathio, a blind pupil, reading braille at a primary school in Rufisque, Senegal. The project is supported by Irish Aid. © Sightsavers/Peter Nicholls.

CASE STUDY 2: ADAPTING THE EARLY GRADE READING ASSESSMENT (EGRA) IN MALI

Funded by USAID and working in close association with the Ministry of Education and the Malian Union of the Blind, Sightsavers has been promoting inclusive education for children with visual impairments in Mali since 2017. Vision Impairment Centre for Teaching and Research (VICTAR) at the University of Birmingham has provided technical assistance.

The project has particularly focused on strengthening children's literacy. Working with parents, it has identified ways in which they can support their children's reading and writing in the home. Working with teachers, it has identified ways of supporting children's literacy in the classroom, even though they teach large classes and possess few resources. As part of the project, Early Grade Reading Assessment (EGRA) has

been adapted so it is accessible for children with visual impairments. EGRA is an oral test that assesses children's ability:

- To identify the sounds in words (phonological skills)

- To combine letters together to produce words (phonic skills)

- To read at a steady rate with appropriate expression (fluency)

- To understand what they are writing (comprehension)

USAID developed EGRA in response to a growing body of evidence that children in developing countries were failing to acquire basic literacy, and were thus failing to realise their potential, both in school and after they left school. As of 2015, EGRA was used in more than 70 countries.

In order to ensure that children with visual impairments could take the EGRA tests, Sightsavers, working in close association with our partners, produced detailed guidelines for assessors. Recommendations included:

1. Braille users should be provided with freshly-brailled texts, as otherwise they might struggle to read flattened braille.
2. Large-print versions of the test should be produced, when necessary, for students with low vision.
3. Braille users should be able to use familiar reading and writing technology when sitting the tests.
4. Assessors should ensure that test conditions are conducive – for instance, there should be sufficient light for children with low vision.
5. Assessors should recognise that children with visual impairments tend to be slower readers than their fully-sighted peers,[40] and should therefore be provided with sufficient time and rest-breaks.

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[40] Best, A., 1992. *Teaching Children with Visual Impairments*. Open University: Milton Keynes. McCall, S., 1997. 'The development of literacy through touch', in Mason, H, McCall, S., *Visual Impairment: Access to Education for Young People* (pp.143-158). David Fulton, London.

The guidelines also identified the various reasons why students with visual impairments might struggle with certain parts of EGRA, and identified teaching and learning strategies for helping these students to overcome these difficulties. Strategies for using EGRA test results to provide targeted literacy support for students were also identified.

Girl with low vision in a school in Mali. The project is supported by USAID. © Sightsavers.

We then piloted the revised EGRA in special and mainstream schools across the country, further revising EGRA in the light of programme learning. Discussions with assessors during and after the piloting process indicated they felt confident administering the test to children with visual impairments. More importantly, the children told us they had enjoyed sitting their tests, were pleased with their performance, and felt they had received appropriate support from the assessors.

In many development contexts, testing and examination systems are often inaccessible for children with disabilities. This project shows that these systems can be made accessible through simple, cost-effective interventions.

CASE STUDY 3: EARLY CHILDHOOD DEVELOPMENT IN MALAWI

Early childhood development (ECD) provides the basis for children's future development and prepares children for primary education (World Bank/UNICEF, 2012). ECD is particularly important for children with visual impairments (children with visual impairments) as it develops their willingness and ability to explore the world, to interact with others, and to care for themselves. Furthermore, ECD interventions can develop the capacity of young children with low vison to make best use of their residual sight.

Funded by Sightsavers, a team of researchers from the University of Birmingham, University of Liverpool and Montfort Special Needs College, Malawi, created, adapted and tested a training package to support the development of young children with visual impairments in Malawi (aged 0-3+) (Lynch *et al*, 2018). The study was conducted in three districts in Southern Malawi that constitute one of the most disadvantaged regions in the country with high levels of poverty, malnutrition, Vitamin A deficiency and active trachoma.

The study consisted of three stages.

Stage 1: designing and developing the intervention

A training package[41] was developed based on the World Health Organization's *Care for Child Development*, but specifically designed to address the needs of children with visual impairments and their caregivers. Additional materials were also added to ensure cultural appropriateness.

The package consisted of 16 laminated counselling cards, each demonstrating play and communication activities for children of different ages (see illustration below). A larger card captured all 16 pieces of advice. Instructions (in Chichewa and English) consisted of short sentences such as "Can you find mama's face?" Later on, the cards were modified to take into account the needs of children with visual impairments with additional needs – for instance, children with cerebral palsy who needed additional assistance to sit upright and to grasp and play with objects.

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[41] The training manual can be downloaded from: https://www.birmingham.ac.uk/Documents/college-social-sciences/education/victar/early-childhood-development.pdf

The team designed a participatory three-day ECD training programme based on the cards, consisting of group and plenary activities, role-play, and material development sessions. Training was then provided to 15 professional community workers.

Stage 2: piloting the intervention

Having received the training, the community workers visited children with visual impairments and their families twelve times over a six-month period. Each community worker supported between one and three children, with home-visits taking an hour on average. Each visit usually consisted of the community worker sharing information about the child, discussing possible activities using the counselling cards, modelling the activity for the caregiver to see, and then setting a small number of activities for the caregiver to try out between visits. All the caregivers were given age-appropriate laminated cards to use at home, as well as a small number of low-cost locally sourced toys to carry out agreed communication and play activities (for example, a rattle to increase a child's ability to stretch their arm and reach for objects).

Stage 3: evaluating the intervention

Post-intervention in-depth interviews, combined with a focus group discussion, showed the intervention had had a significant impact:

- Parents were now more likely to allow their children to go out of the house and interact with their peers.

- Through communicating more effectively with their children, caregivers were better able to identify the needs of their children.

- Children were now playing with a greater range of more stimulating toys, as community workers and caregivers had made their own toys (these included a doll stuffed with paper, cars made from wire coat hangers, and a sorting game using coloured plastic squares).

- Most carers said they had incorporated an element of play into everyday activities, although they had originally said this would be difficult to do.

- Caregivers were more loving towards their children and more accepting of their child's disability.

- Community attitudes were improving due to the increased visibility of the children in their communities.

- Parents of the older children who had visited local nurseries as part of the intervention were now more positive about their children's future.

The study demonstrated the impact of low cost ECD interventions for children with disabilities using existing systems and structures, and adapting existing training materials.

What is deafblindness?[42]

Deafblindness is a combination of vision and hearing impairments. It is also described as multi-sensory impairment (MSI). Some children are completely deaf and blind, but many have a little sight and/or hearing they can use. Children with deafblindness may have other physical and learning disabilities as well. Some children are born with deafblindness – for example, if their mother had German measles (rubella) during pregnancy. They may lose their sight and/or hearing gradually due to a genetic condition, while others may suffer an accident or illness that causes sight and hearing loss.

Barriers

Children with deafblindness face many barriers including:

- Communication - it can be hard for children with deafblindness to express their needs and make themselves understood.

- Isolation – communication barriers can lead to children and their family becoming isolated and excluded.

- Understanding – without the right support, it is difficult for a child with deafblindness to understand what is going on around them.

- Mobility – children with deafblindness often need support to move around safely.

Assistive devices and support

All children with deafblindness need functional and clinical assessments so that they can be fitted with appropriate assistive devices such as reading glasses and hearing aids. Some people with deafblindness use a red and white striped cane to aid their mobility and to identify themselves as having a combined sight and hearing impairment.

In some countries, professional interpreter-guide services are available to support people with deafblindness with communication and mobility. Where trained interpreter-guides are not available, family members often have to provide support.

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[42] The content for this case study was provided by Alison Marshall, Director, Sense International, a UK-based international non-government organisation supporting children with deafblindness and their families in developing countries.

Communicating with children with deafblindness

Children with deafblindness and those working with them can use a range of different approaches to communicate, often in combination (known as 'total communication').

Approaches include:

- Using hand signs and objects of reference, such as holding out a mug to indicate that they are thirsty and want a drink.

- Tactile sign language, including signs indicated in the palm of one hand, finger-spelling and tactile alphabet/signs.

- Braille, including accessing the internet through a braille keyboard.

Access to education

Global data shows that children with deafblindness are much less likely to be in school compared to children without disabilities, and are also less likely to be in school compared to children with other disabilities (World Federation of the Deafblind, 2018). In some countries, children with deafblindness are 23 times less likely to be in school compared to children without disabilities.

Supporting children with deafblindness

With the right support, children with deafblindness can learn alongside their peers in local schools. Early identification and referral programmes for infants and young children with deafblindness can make a big difference to their educational outcomes.

Learners with deafblindness have different needs, so teaching and learning strategies may vary a lot between different individuals. Sometimes children with deafblindness need to sit close to the front of the class to see the blackboard and hear the teacher. Others may need enhanced lighting. A teaching assistant can make a big difference, supporting a child with deafblindness to take part in the lesson that the class teacher is leading.

Aadila

Aadila in the classroom with her learning assistant © Sense International.

Aadila (not her real name) is a six-year-old girl in Tanzania. She has poor vision and significant hearing loss. Initially she would only communicate through signs and do nothing else, but now, with support from Sense International, a UK-based international non-governmental organisation, she has started going to her local primary school.

Since going to school, she has learned to write numbers from 1 to 5 and plays with the other children. According to her class teacher, she takes good care of her possessions and is very self-aware. She can follow instructions and learns well by imitation. She enjoys brushing her teeth, watering the school garden, and writing in her exercise book. She has a classroom assistant in school, and teachers from a local special school visit her every three months to provide additional assistance.

When Aadila received a medical examination, it was found she would benefit from using a hearing aid. However, Aadila refused to wear the aid and it has therefore been decided to re-introduce the hearing aid when she is older.

Despite all the progress she has made, Aadila still faces a number of challenges. There are 98 other children in her class, and this creates a distracting environment for her. It is also very difficult for her to access the school toilet because of various obstacles. She becomes frustrated and can take a long time to calm down when she needs something and the people around her don't understand her needs.[43]

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[43] From Mmbaga & Kisenha (2018).

Uncorrected refractive errors (URE) are the most common cause of poor vision in children. These treatable conditions affect a child's life through difficulties with activities of daily living, mobility, reading and fine work. Refractive errors result in an unfocused image falling on the retina that causes blurred and/or distorted vision, and can usually be fully corrected by spectacles.

School-based vision screening programmes have been developed to address the issue of REs in school-age children. However, these programmes are often non-standardised, are conducted on an ad hoc basis, and are not aligned with current systems and structures within the country.

Sightsavers' response: the SHIP initiative

The School Health Integrated Programming (SHIP) project was developed and implemented by Sightsavers and the Partnership for Child Development (PCD), with support from the World Bank and the Global Partnership for Education (GPE). The aim was to demonstrate how schools can be used as a platform to deliver health interventions using deworming and vision screening as exemplars. The approach used the two health interventions as entry points to raise awareness, capacity and engagement among governments towards comprehensive School Health and Nutrition (SHN). The SHIP project was initially implemented in four focus countries: Cambodia, Ethiopia, Ghana, and Senegal.

The model is now being scaled up to Liberia, where Sightsavers, in collaboration with the Ministries of Education and Health, is working to vision screen and deworm all primary and secondary school students in four out of the 15 counties. In order to support sustainability, Sightsavers is advocating that vision screening is incorporated into the school health policy and that school health is incorporated into the Education Sector Plans.

The SHIP Model

In the SHIP model, teachers are trained to conduct vision screening and provide deworming drugs in an integrated training session, based on standardised guidelines. The teacher would screen the children using a simple vision screening kit that was provided during the training, and refer children who failed the screening to a mobile refraction team. The teachers also provide the deworming drugs to the children during this period.

The mobile refraction team travel to each school, or a cluster of schools, to examine children who failed the screening and provided ready-made spectacles on the spot, or custom-made spectacles that are ordered and delivered to the child when available, at no cost to the student. If the student cannot be corrected or has other ocular conditions, they will be referred to the closest eye unit for further examination and treatment, as needed. Teachers are also screened for visual impairment.

Key lessons learned

The key lessons learned from the SHIP initiative are as follows:

Eye screening at Wenchi Catholic School, Ghana. © Sightsavers.

1. **Schools can be used as an effective platform for delivering health interventions.** Schools can be used to deliver health interventions, such as vision screening and deworming. By raising awareness that poor health affects a student's ability to perform in school, the interventions can be seen as an education issue, not just a health issue. This shift in approach targets the MOE in the country, and creates synergies between the ministries of education and health. Therefore, it is crucial to identify and target key departments and stakeholders from the inception of a programme.

2. **Collaboration between Ministries of Education and Health is vital, and proper mechanisms must be put in place at the very start of the programme to support this partnership.** In order to effectively use schools as a platform to deliver health interventions, mechanisms must be put in place to facilitate the collaboration and coordination between education and health sector staff, with identified roles and responsibilities. Ongoing dialogue between the two ministries is crucial to identify and address issues and challenges early on in the process. Furthermore, coordinating SHN programmes under a single umbrella can streamline activities and ensure that SHN programmes do not duplicate implementation MOE or MOH strategies that may already be in place.

3. **Integrating simple school-level activities that are easy for teachers to implement is a more efficient use of time and resources than multiple vertical interventions**. Due to the range of implementing partners, and differences in delivery and reporting timelines, separate teacher training programmes are frequently used for different school-health interventions. This approach is both expensive and keeps teachers away from the classrooms for longer periods of time. Through delivering both deworming and vision screening training as part of one integrated training program, the SHIP initiative demonstrated that the integration of multiple programmes is both feasible and serves to lower the resources and time required compared to conducting separate trainings. Integration can be done at multiple levels, and the actual implementation of different interventions can be arranged which align with the school schedule and in line with the nature of the intervention.

4. **Capacity building and alignment with existing policies, systems, and infrastructure supports ownership and sustainability within SHN programming.** One of the critical elements that promoted the success of the SHIP project was in ensuring that the work was aligned and placed within local context. This can be accomplished through identifying existing policies, systems, and infrastructure. The existing policies can be leveraged to strengthen and support SHN strategies, where applicable.

Abigail's story

Sightsavers interviewed Abigail, a 15-year-old girl at Junior High School in Denkyembour, Ghana who had participated in the SHIP Programme.

Abigail reported:

"My glasses are cool – they've helped me to read and I also can see clearly. Before, I couldn't see the board and I couldn't see far away. And when the sun was shining there would be tears flowing from my eyes. I had problems in the class, when I was sitting far from the board I couldn't see and I felt pains, but now it's ok. I attended the eye clinic before and they said I should buy glasses but there was no money so I was not able to afford them. I felt so upset because I was suffering and I didn't get help. When the teacher told me I could get glasses I was very happy, because to get them my problem would be solved, and now it is! My favourite subjects are science, social science, Arabic and home economics, I like school. Before I had my glasses I only liked it sometimes, when my eye problem came I would feel so bad, I wouldn't even go outside because the way I was suffering, I didn't know whether other people were also suffering from the same problem so I was there quietly. Some of my friends would be asking what's wrong and I'd say nothing, I didn't want them to know there was a problem because they can't help. Some of them had the same problem but they had the glasses. I like the way I look when I wear them. I want to be a nurse when I am older, my senior sister is a nurse, the way she behaves – I love it – I want to be one too."
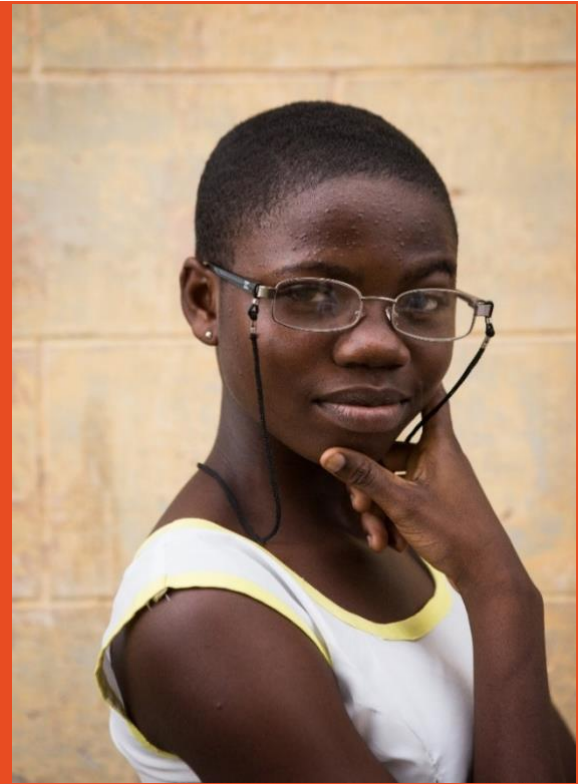
Abigail © Sightsavers

"My glasses are so cool – they've helped me to read and I also can see clearly. Before, I couldn't see the board... and when the sun was shining there would be tears flowing from my eyes."

CONCLUSION

This report has outlined educational realities for children with visual impairments across sub-Saharan Africa and placed these realities in various contexts. As the focus group discussion with leaders of the disabled people's movement across Africa indicates, there is broad agreement about the best ways forward.

On the one hand, schools and other education providers need to provide more supportive, stimulating and conducive places for **all** learners. For instance, all children will benefit if pedagogies are more learning-focused, curricula are broader and more balanced, and monitoring and assessment systems are more responsive to the needs of learners.

On the other hand, children with visual impairments, like other children with disabilities, have specific needs related to their impairments. They need access to certain types of assistive device (see Appendix 2) and particular types of training and tuition. Even relatively simple adaptations can make a huge difference – for instance, placing the child with low vision near the front of a classroom, ensuring braille-users have sufficient desk-space, painting stripes on the edges of steps, and teachers writing in large, clear letters on a blackboard.

In short, Ministries of Education – supported by civil society and the international development community – need to adopt a 'twin-track' approach to inclusive education.

However, it will not be possible for Ministries of Education to do this effectively unless there is:

- sustained and increased investment in inclusive education. As Sukhraj-Ely has shown in her analysis of education reform initiatives in South Africa, inclusive education is not a cheap alternative to special schooling.

- evidence-based programmes of educational reform initiative that are rigorously designed, monitored, evaluated and responsive to emerging learning.

- a multi-dimensional, inter-sectoral approach to education reform that recognises that children with visual impairments have diverse and multiple needs, and therefore require appropriate service provision from early childhood onwards.

- inclusive education that, rather than being imposed from above, emerges from below and thus draws on the passion, creativity and expertise of local stakeholders, particularly people with disabilities.

- rigorous research and investigation into education access, quality and outcomes for children with disabilities and the factors shaping this provision – along with strengthening of Education Management and Information Systems so they collect more reliable, valid and comprehensive data.

- increased commitment by the international development community to the promotion of inclusive education for children with disabilities across sub-Saharan Africa, especially in fragile states and humanitarian situations.

We hope this report, which draws on a variety of sources and information to provide a panoramic survey of educational realities for children with visual impairments across sub-Saharan Africa, will contribute to the above process.

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Cameroon

According to the Ministry of Basic Education (MoBE), children with visual impairments are either enrolled in special schools or fully mainstreamed. Special schools fall under the auspices of the Ministry of Social Affairs, and are mostly either run by individuals or faith-based organisations. They are not free, with tuition varying from XAF20,000 in government schools to XAF400,000 in private schools. At present, the EMIS does not collect disability-disaggregated enrolment data. Some initial teacher-training in the education of children with disabilities is available, but this is predominantly provided by non-government institutions. Some continuous professional development in the education of children with disabilities is available, but only for teachers working in the national network of 68 inclusive schools. This CPD also does not provide teachers with the skills and knowledge to teach children who are blind and children with severe visual impairments. There are some orientation and mobility professionals in the country, but their number is not known, and O&M provision is patchy and of variable quality. There are some professionals providing training in orientation and mobility and other skills areas for children with visual impairments, but provision is irregular and often reserved for children in special schools. Children with visual impairments use a variety of assistive devices, but most of these devices have to be imported and are expensive/in short supply. Children with visual impairments have virtually no access to ICT. Braille reading materials are produced in-country, but are often not available for children with visual impairments. Large-print reading materials for children with low vision have to be produced by the teachers themselves. Children with visual impairments lack access to screening, assessment and follow-up services, although the situation is better for children enrolled in special schools. Children with refractive errors are not often supplied with spectacles. For the MoBE, an important recent initiative is the establishment of a national network of 68 inclusive schools – an initiative which has been supported by Sightsavers. The project will not only develop the capacity of the schools, but strengthen the support systems for those schools at local, district and national levels.

Ghana

Children with visual impairments in Ghana are either educated in mainstream schools or in special schools. According to Ghana Education Service, there are:

- 34 girls with visual impairments and 48 boys with visual impairments in enrolled in pre-primary education
- 133 girls with visual impairments and 214 boys with visual impairments enrolled in primary education
- 130 girls with visual impairments and 186 boys with visual impairments enrolled in secondary education

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[44] The data and information were collected from the Ministries in 2019.

Ghana Education Service also keeps records of children with visual impairments with additional disabilities enrolled in primary and secondary education:

- 34 girls and 55 boys with visual impairments and additional impairments were enrolled in primary education

- 33 girls and 43 boys with visual impairments and additional impairments were enrolled in secondary education[45]

There are two special schools and nine integrated schools for children with visual impairments across the country, with a total enrolment of 778 (335 girls and 443 boys). Education is provided free of charge in the special and integrated schools. While disability-disaggregated data is collected on the educational outcomes of children with visual impairments, the data was not available from Ghana Education Service, although we were told the data was available in individual schools. According to Ghana Education Service, trainee teachers access pre-service training on the education of children with visual impairments that provides them with the knowledge and skills to include children with visual impairments in their classes. However, practising teachers have minimal access to continuous, good quality professional development of the education of children with visual impairments. According to Ghana Education Service, there are specialist teachers of children with visual impairments, orientation and mobility specialists, and braille experts in Ghana – although Ghana Education Service did not provide the numbers of such personnel. Ghana Education Service expressed concern about the quality and availability of orientation and mobility instruction in the country. Different types of assistive technology are used by children with visual impairments in Ghana, but the supply is inadequate. School-students with visual impairments have little or no access to ICT. Braille and large-print reading materials exist in Ghana, but improvements in terms of quality and quantity of supply are required. Similarly, children with visual impairments lack access to good quality assessment and screening services and appropriate follow-up (medication, treatment and assistive devices, including customised spectacles).

Kenya

Children with visual impairments are educated in special schools, integrated schools (where they are taught for at least part of the day in separate units), and mainstream schools. While tuition is free in primary schools, parents pay for other costs – for instance, food and accommodation if their child attends residential provision. Through its National Education Management Information System (NEMIS), the Ministry of Education (MoE) collects sex-disaggregated and disability-disaggregated data at primary level. According to MoE:

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[45] Enrolment data are only collected for children with visual impairments enrolled in special schools. Children with visual impairments enrolled in mainstream schools are not included in the data.

- 12,136 children with visual impairments are enrolled in primary education (1,699 who are blind and 10,437 with low vision; 5,766 girls and 6,390)

- 680 children with visual impairments are studying at secondary level in special and integrated schools (322 students who are blind and 358 students with low vision)[46] [47]

The Ministry of Education acknowledges that data collected is not always reliable – for instance, NEMIS registers only those with birth registration certificates, and head teachers may sometimes inflate figures to secure more capitation funds. Head teachers also sometimes lack the ICT skills to complete the data entry and delegate this task to others, sometimes leading to inaccuracy. Data on educational outcomes is collected by the National Examinations Council rather than the Ministry of Education and, as such information takes two months to collect, it was not available for this study. There are 298 specialist teachers of children with visual impairments based in special schools and units attached to mainstream schools, all of whom have Diplomas in Special Needs. This figure does not include a number of other specialist teachers of children with visual impairments who are working in mainstream schools but not attached to units, and therefore not eligible for Special Duty Allowance. Specialist teachers of children with visual impairments are training at the Kenya Institute for Special Education (KISE) and other institutions. At present student-teachers in primary teachers colleges receive some training in the education of children with disabilities. This training will become more thorough once the training curriculum has been revised so it is aligned with Kenya's Competency-Based Curriculum. In-service training is not generally available for practising teachers unless they pay for it themselves. Various cadres of specialists provide speech therapy, physiotherapy, low vision training and other services. However, children with visual impairments sometimes do not receive these services, especially if they enrolled in mainstream schools, as these specialists are based in hospitals. There are no orientation and mobility instructors in Kenya. However, children with visual impairments receive O&M training from teachers of the visually impaired who have received basic training in O&M. Transcribers play a valuable role in Kenya, as they not only transcribe print to braille, and vice versa, but teach pre-braille skills and repair Perkins Braillers. Itinerant teachers also provide braille tuition for children who are blind. A wide variety of assistive devices is used in schools, but availability is limited, even though the National Council for Persons with Disabilities under the Ministry of Labour is mandated to provide this technology. Only children in special schools access ICT. There is a shortage of braille reading materials produced by the Kenya Institute for the Blind (KIB) and the Africa Blind Centre (ABC). However, the Ministry of Education plans to address this problem. Large-print reading materials are not generally available, but last year the Ministry produced large-print maths textbooks for students in Grades 1 and 2. Assessment Officers (AOs), attached to Educational Assessment and Resource

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[46] These figures for secondary data only cover children enrolled in special and integrated schools. They do not include children who have been fully mainstreamed.

[47] Secondary school is not disaggregated by sex.

Centres (EARCs), play a key role in identifying and assessing children with visual impairments and organising their educational placement. However, EARCs often lack key assessment tools, like Snellen charts and even pen-lights. In addition, very few AOs have been trained in visual impairment. Children with visual impairments have very limited access to eye health services due to the shortage of such services and the costs associated with accessing these services – although children with visual impairments enrolled in special schools have greater access than those enrolled in mainstream schools. Parents are often expected to procure glasses for their children, so children with refractive errors often lack necessary refraction.

Liberia

According to the Ministry of Education, there are seven special schools in Liberia and special schooling is the only type of education available to children with visual impairments. When we contacted the MoE, it was not able to provide numbers of children with visual impairments enrolled in these institutions. According to the MoE, there are no specialist teachers of children with visual impairments in the country and no specialist training in this field is available. Student teachers do not receive any pre-service training in the education of children with visual impairments and other children with disabilities, and no in-service training/continuous professional development is available for practising teachers. There are three orientation and mobility specialists in the country, one trained in Kenya and two trained in Ghana, who provide outreach services for schools and communities. There are also two rehabilitation specialists based in the Ministry of Education, but provision is considered inadequate. Students with visual impairments have no access to ICT and are only able to access a limited range of assistive devices: a small quantity of writing frames and styluses, white canes, and Perkins Braillers. Braille tuition is available for students in special schools, but it is not always of satisfactory quality. A small number of large-print reading materials are available for students with low vision – these are either produced centrally or by the schools themselves. Eye health services are generally poor. The MoE identified the main obstacles to the improvement of services as: inadequate financial support; bureaucratic hurdles; and the lack of priority attached by policy makers and implementers to the education of children with disabilities. According to the Ministry of Education, there are no projects in the country at present supporting the education of children with disabilities. According to the Ministry, "There is a serious need to improve/upgrade our education system to promote inclusive education. Inclusive education is working in other countries which shows it is workable here".

Malawi

In Malawi, the EMIS collects data on the enrolment and retention of children with visual impairments in primary and secondary schools. However, pre-primary data is not collected, data on educational outcomes (for instance, test and examination results) is not disability-disaggregated, and there is insufficient analysis of existing data. According to the Ministry of Education, Science and Technology (MEST):

- 35,632 children with visual impairments were enrolled in primary education in 2017 (17,843 girls and 17,789 boys; 496 children who are blind and 35,136 who had low vison)

- 3,326 with visual impairments were enrolled in secondary education in 2017 (112 children who are blind and 3,214 with low vision)[48] [49]

At present, 388 children who are blind (181 boys and 157 girls) are studying in 12 special schools where education provision is totally free (there are no additional charges for food and accommodation). According to MEST, there are 76 specialist teachers of children with visual impairments in the country (60 male and 16 female) supporting students in special and integrated schools. A three-year course for specialist teachers of children with visual impairments is provided by Montfort College, but there is a lack of demand for this training due to lack of financial incentives. While student teachers receive some pre-service training in the education of children with visual impairments, only a minority of practising teachers are able to access continuous professional development in this field. While there are various cadres of rehabilitation professionals providing diverse services to children with visual impairments, MEST believes these services need to improve. children with visual impairments receive orientation and mobility instruction, but this instruction is not always of good quality, due to a shortage of orientation and mobility specialists in Malawi. children with visual impairments have no access to ICT and are only able to access a limited supply of assistive devices. According to MEST, there are sufficient braille reading materials (either produced in-country or imported from abroad), but their quality is not always satisfactory. Large-print reading materials are not generally available and are not always of good quality. According to MEST, eye health services are widely available and there are good links between education and health services. However, the quality of services needs to improve. Spectacles are unaffordable for many families, there is a shortage of magnifiers for children with low vision, and parents are sometimes reluctant to refer their children to eye health services. The most significant project focusing on the education of children with disabilities in Malawi at present is the USAID-funded REFAM project that is supporting early reading, the assessment of reading and the training of teachers.

Mali

Children with visual impairments attend special schools and mainstream schools. The national EMIS does not collect disability-disaggregated data, but the Ministry of Education, along with the Ministry of Social Development, collects enrolment data on children with visual impairments enrolled in special schools. According to the Ministry of Education (MoE), there are four special schools in Mali with a combined enrolment of 314 (202 boys and 112 girls). Education is free for these students, except for those attending the special school in Bamako who have to pay for their food and accommodation. According to MoE, there are 155 specialist teachers of children with visual impairments in Mali (52 female, 103 male), supporting children in a range of educational institutions. Malian Union of the Blind (UMAV) employs ten itinerant teachers of children with visual impairments whose salaries are met by the MoE. Training for specialist

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[48] Data only cover children with visual impairments studying in special schools and integrated schools. children with visual impairments who have been fully mainstreamed are not included.

[49] Sex-disaggregated data was not provided for secondary education.

teachers of children with visual impairments is not available in Mali. However, student teachers receive a basic orientation on the education of children with visual impairments, and practising teachers are sometimes able to access continuous professional development on the education of children with visual impairments. According to the MoE, there are 16 orientation and mobility instructors in Mali. However, these instructors are based in or around Bamako and would benefit from further training. A variety of assistive devices are used in schools, and children with visual impairments are sometimes able to access ICT. Comprehensive braille support is available to students attending the special school in Bamako, but elsewhere braille tuition is patchy and uneven. Braille reading materials are not widely available and are not always of good quality. Large-print materials are produced by the teachers themselves. Eye health services are not always available or of sufficient quality, and spectacles are unaffordable for many parents. MoE identify Sightsavers and Humanity & Inclusion as the major international development organisations working in the field of disability and education. The MoE believes there is a need to promote inclusive education and that the development of a new national inclusive education policy will be a first step to achieving this.

Nigeria

According to the Federal Ministry of Education (FMOE), children with visual impairments are educated in special schools at primary level and integrated schools at secondary level. FMOE estimated that there are about 300 such schools in Nigeria. Children with visual impairments are also fully mainstreamed, with 15 out of the country's 100 'Unity Schools' providing inclusive education. The education system collects enrolment data, but this data is 'domiciled' in the individual states and the Universal Basic Education Commission – so was not available from FMOE. However, FMOE estimated that up to 100,000 children with visual impairments could be enrolled in primary and secondary schools across the country. Although FMOE stated that that it disaggregates data on education outcomes for impairment-groups (including visual impairment), this data was not available from the Department of Special Education – our contact point within FMOE. FMOE reported that a variety of assistive devices and learning materials for children with visual impairments can be found in Nigeria – a number of which are supplied to the Unity Schools. Unfortunately, the majority of these resources are imported and are therefore prohibitively expensive for most children with visual impairments and their families. According to FMOE, pre-service and in-service training is available to classroom teachers that provides them with the skills and knowledge to include children with visual impairments in their classes. There are O&M professionals and rehabilitation workers in Nigeria, although FMOE could not provide exact numbers. While braille tuition is available, it needs to improve in terms of quantity and availability. FMOE declined to comment on the availability and quality of eye health provision as the Federal Ministry of Health is statutorily responsible for this.

Senegal

According to the Ministry of Education (MoE), children with visual impairments are either fully mainstreamed or attend the only special school for children in Thies, 70 kilometres from Dakar. EMIS data collection tools have been revised and next year disability-disaggregated enrolment data will be collected for the first time. At present, this data is not available. According to EMIS, the only specialist teachers of children with visual impairments are based in the national special school. Student teachers do not receive

pre-service training on the education of children with visual impairments and other children with disabilities, but Sightsavers organises continuous professional development in this subject for practising teachers in selected schools. There are no orientation and mobility specialists in Senegal, although teachers in the special school provide O&M training for their students. Elsewhere in Senegal, O&M training is generally unavailable. Similarly, there are no rehabilitation professionals in the country, meaning children with visual impairments cannot access training in daily living skills and communication skills. Children with visual impairments can access a limited range of assistive devices but have no access to ICT. There is a limited supply of braille reading materials, and these are only available to students in the national special school and in pilot schools supported by Sightsavers. Large-print reading materials are not available. Eye health services require improvements in quality and quantity. In particular, there is a need for early screening in schools, more trained human resources, and the provision of affordable spectacles. The MoE believes that it has made significant progress in recent years thanks to its own efforts and support from Sightsavers. It also believes a new inclusive education policy and a strategic plan will help the ministry to improve the situation.

Sierra Leone

Children with visual impairments in Sierra Leone either attend one of the five special schools for children with visual impairments or are fully mainstreamed. The Ministry of Education Science and Technology (MEST)[50] had collected disability-disaggregated data since 2018, but was not able to share the data as tools were being reviewed and the data being cleaned. There are a number of specialist teachers of children with visual impairments who are based in the special schools, and the University of Makeni (UNIMAK) is seen as the key provider of specialist training in the education of children with visual impairments. At present, pre-service teachers are provided with little or no training in the education of children with disabilities (including children with visual impairments), but the teacher-training curriculum is at present being revised so it addresses disability inclusion issues. There are orientation and mobility specialists in Sierra Leone who were trained at the University of Winnebah in Ghana, but MEST did not provide further information about these individuals. There are also rehabilitation specialists, but again the MEST did not provide further information. A very limited number/restricted selection of assistive devices are available for children with visual impairments – primarily children with visual impairments enrolled in special schools. Children with visual impairments enrolled in special schools have some access to ICT. Braille reading materials are produced in-country, but they are limited in terms of quantity and quality. Only basic training in braille is available for children with visual impairments. Large-print reading materials are not available. Sometimes children with visual impairments receive necessary screening, assessment, counselling and follow-up support (such as treatment, medication and refraction). At other times, children with visual impairments do not access such eye health services – sometimes because of long and difficult journeys to clinics and hospitals, sometimes because of the costs associated with such services, and sometimes because of

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[50] This Ministry has now been renamed Ministry of Basic, Secondary and School Education (MBSSE).

negative/sceptical parental attitudes. MEST believes "Sierra Leone is gradually progressing, as children with visual impairments are now enrolled in both primary and secondary schools".

Uganda

According to the Ministry of Education and Sports (MoES), children with visual impairments are taught in special schools and in integrated schools. They are also fully mainstreamed. EMIS collect enrolment and transition data at pre-primary, primary and secondary levels disaggregated by sex and disability. However, the most recent data was collected in 2016. According to the MoES:

- 6,249 children with visual impairments were enrolled in pre-primary education in 2016 (2,220 who were blind; 4,049 with low vision; 3,000 girls and 3,249 boys)
- 36,792 children with visual impairments were enrolled in primary education (17,000 who were blind and 19,792 with low vision; 12,202 girls and 24,790 boys)
- 3,709 children with visual impairments were enrolled in secondary education (1,500 students who were blind and 2,209 students with low vision; 2,105 boys and 1,604 girls)[51]

According to MoES, there are 37 special primary schools and 20 special secondary schools for children with visual impairments. Parents of children attending government special schools need to cover the cost of food, accommodation, medical services, scholastic materials and uniforms. Parents of children attending non-government institutions need to pay school fees on top of this. Training is available for specialist teachers of children with visual impairments, and there are at present a cadre of such specialists supporting children with visual impairments in a range of educational settings. Student-teachers are provided with a basic orientation on the education of children with visual impairments as part of their pre-service training, but practising teachers cannot access relevant continuous professional development. Overall, MoES believes there is a sufficient number of specialist personnel working in the field of the education of children with visual impairments – although these individuals require refresher training. High pupil-teacher ratios also mean classroom teachers often struggle to meet the needs of children with visual impairments. Kyambogo University provides training for orientation and mobility specialists, but there are not enough O&M specialists in Uganda, and those that exist require refresher training. The same is true of rehabilitation specialists. Various types of assistive technology are available for in schools, but the supply is inadequate and children with visual impairments have little or no access to ICT. Braille reading materials are both produced in-country and imported from abroad, but they are not always available. Only a minority of students who are blind are able to access comprehensive braille support (including the teaching of pre-reading skills). Similarly, large-print materials are only available to a minority of students with low vision. Eye health services need to be improved and made more available and accessible.

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[51] EMIS does not collect data on children who are visually impaired and also have other disabilities – such as children with deafblindness.

Zambia

According to the Ministry of General Education (MoGE), children with visual impairments are enrolled in special schools and integrated schools and sometimes fully mainstreamed. There are six special schools for these children and 21 units across the country. Education is free to all learners from Grades One to Eight, but parents of children with visual impairments studying in Grade Nine and above are sometimes expected to pay user fees and boarding charges, even though this is a contravention of the Disability Act (No.6) of 2012. According to the 2015 Statistics Bulletin (more recent data had not been collected, and no data was provided for children fully mainstreamed):

- 7,304 children with visual impairments were enrolled in primary education (2,987 of whom were blind and 4,317 with low vision; 2,378 girls and 3,137 boys)
- 3,137 children with visual impairments were enrolled in secondary education (2,237 of whom were blind and 899 had low vision; 2,378 boys and 759 girls)
- 6,210 children with visual impairments were educated in integrated primary schools and 1,094 in special schools
- 2,099 children with visual impairments were educated in integrated secondary schools and 1,038 in special schools

Six teacher-training institutions provide specialist training for special educators working with children with visual impairments. However, student teachers in teacher training colleges do not receive an adequate orientation on the education of children with visual impairments. Continuous professional development on this subject is also not available for practising teachers. 96 personnel (82 male, 14 female) have received training in orientation and mobility at the Zambia Institute of Special Education (ZAMISE), but children with visual impairments living in rural areas have little or no access to O&M instruction. There are no rehabilitation professionals providing specialist support for children with visual impairments and their parents in subjects such as daily living skills and communication skills. There is a shortage of assistive devices in schools, as the last grant for such devices was provided by DANIDA, JICA and DFID in 2007. Braille reading materials are produced in-country by Zambia Library, Cultural and Skills Centre for the Blind and Visually Impaired, but are in short supply. Eye health services tend to be concentrated in urban areas at the expense of children with visual impairments living in rural areas. Spectacles are also often unaffordable. While special educators carry out school-based assessments of students, these assessments may not identify children with refractive errors. Even if these assessments identify children who have difficulties with seeing, these children may not receive the necessary follow-up support from eye health services, due to the lack of integration between education and eye health services. For the MoGE, Leonard Cheshire Disability and Plan International are the two key international agencies working in the field of education and disability.

Assistive technology for children who are blind[52]

- **Braille slate/writing frame with stylus** (see picture on left). The braille state/writing frame with stylus is widely used by blind pupils across sub-Saharan Africa. This equipment is light, robust and relatively affordable. However, pupils should not be asked to braille large quantities of text using this equipment, as they will find this task both physically demanding (as it places great demands on the fingers and wrists) and intellectually taxing (as braille has to be written back-to-front). You can find instructions for using this equipment on the following website:

    https://www.louisbrailleonlineresource.org/slate-and-stylus.html

- **Perkins Brailler** (see below). This is like a large braille typewriter and enables children who are blind to write braille quickly and relatively easily, as long as they have sufficient strength and skills. Unfortunately, Perkins Braillers are very expensive compared to braille slates, and require periodic maintenance. You can find instructions for using this equipment from the following website: http://www.brl.org/intro/session02/perkins.html

- **Braille paper** is needed for Perkins Braillers
- **Braille number line 1-10**
- **Braille number square 1-100**
- **Abacus**
- **Pegboard and geo-board** – both of these can be made by the teacher
- **Compass**
- **Tactile ruler**
- **Tactile protractor**
- **Spur wheel**
- **Plastic sheets**

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[52] Some pupils with low vision will need to learn to use these types of assistive technology if they have very little sight or will experience significant sight loss in the future.

- **Three-dimensional and two-dimensional geometrical shapes** for mathematics
- **Cubarithm** (see picture on right). This is a braille maths teaching aid which consists of arithmetic cubes and a board. It helps pupils to lay out and solve sums. The plastic cubes are embossed with braille signs using the upper four dots of the braille cell (dots 1, 2, 4 and 5). Calculations are made by placing the cubes into the appropriate spaces on the board with the braille uppermost. Due to the small size of the cubes, it is recommended that young children use the cubarithm under adult supervision. Instructions for

Arithmetic cubes and board. © Sightsavers/Javier Acebal

using a cubarithm can be downloaded from the following website: https://shop.rnib.org.uk/cubarithm-board.html
- **Talking calculator**
- **Ball with rattle** (for sport).
- **Tactile maps and diagrams** (these can sometimes be made by the teacher
- **Braille clock-face**
- **Long white cane** (see picture on right). A long cane provides people with visual impairments (both people who are blind and people with low vision) with valuable information about the ground they are walking on and any potential obstacles in front of them. A white cane also informs other people that the individual using it has a visual impairment and can also provide some protection for the user in a busy and crowded environment. A white cane needs to be the correct length – generally it should extend from the floor to the underarm of the user, though some people prefer longer canes. People with visual impairments often prefer folding long canes as they are seen as more convenient. People with visual impairments also use **symbol canes** and **guide canes**. For more information, see:

https://help.rnib.org.uk/help/daily-living/transport-travel/need-cane
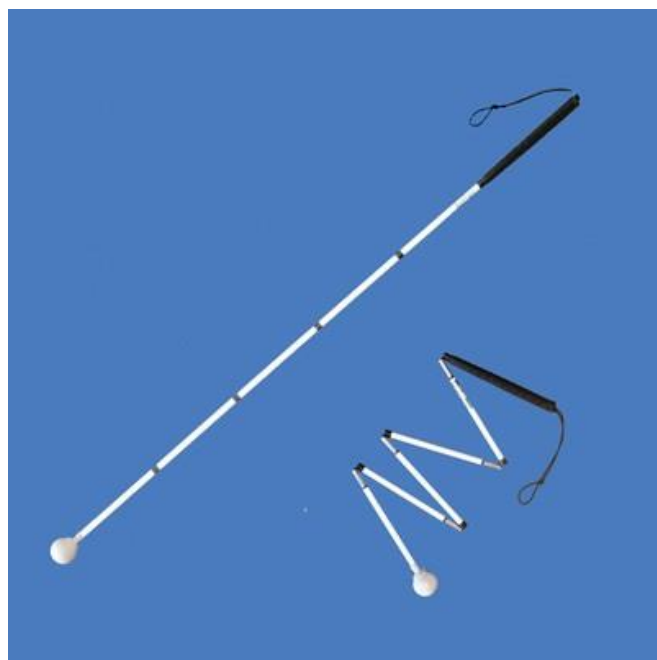
Equipment for pupils with low vision[53]

- **Optical low vision aids** (as required by the pupil) – including glasses, hand-held magnifier, stand-held magnifier, monocular – see selection of aids in picture below. For more information, see:
  http://www.visionaware.org/info/overview-of-low-vision-devices/low-vision-optical-devices/45

- **Non-optical low vision aids** (as required by the pupil) – for instance, thick-tipped pens, reading-stands, bold-lined paper, wide-lined paper. For more information, see:
  https://www.teachingvisuallyimpaired.com/non-optical-low-vision-devices.html

The picture on the right shows a writing guide – an example of a non-optical low vision aid. A writing guide is a piece of card with long rectangular slits cut out of it. The pupil puts a piece of unlined paper inside the writing guide and writes in the slits. Paper clips keep the paper in place. Writing guides are very useful for pupils with low vision who find it hard to see the lines on a piece of paper, and thus to write in a straight line. Other pupils in your class who also have difficulties writing in a straight line will also

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[53] If a child with little vision has very little sight or will experience significant sight loss in the future, they will need to learn to use the assistive technology required by their blind peers. Both children who are blind and children with low vision will benefit from learning white cane skills.

find writing guides useful. If you are unable to purchase writing guides, you can make writing guides for yourself out of card.

- **Large-print text, including textbooks** – this material is desirable, but rarely available unfortunately.
- **Large-print number line from 1-10**
- **Large-print number square from 1-100**
- **Large-print calculator**
- **Large-print clock face**
- **Simplified diagrams, maps and charts** - see example below.
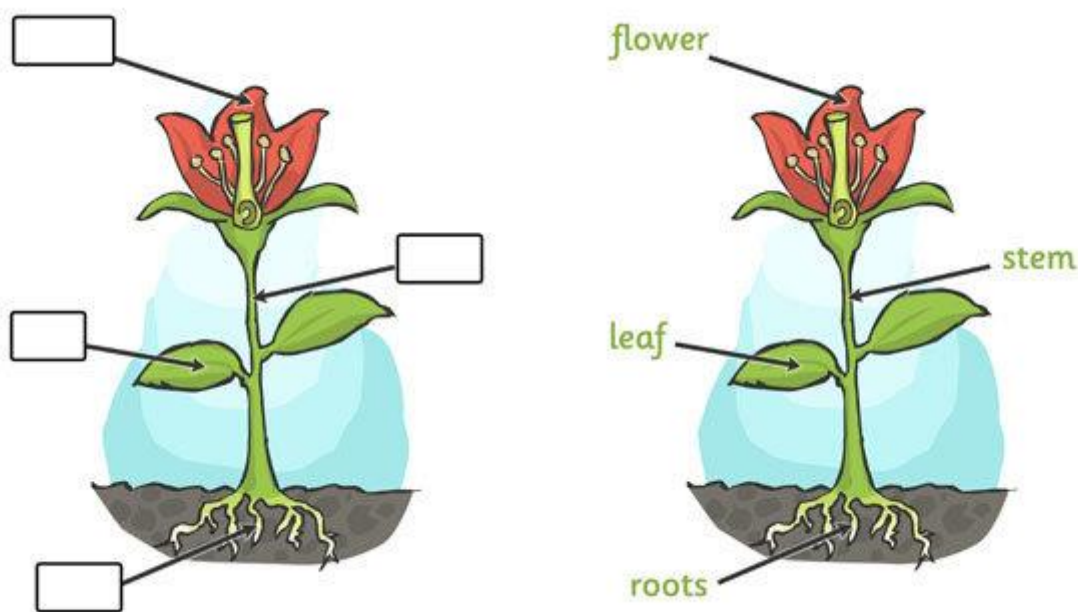
Equipment for the classroom teacher

- **Perkins Brailler with braille paper** – this will enable the teacher to braille material for the pupils and also regularly practise his/her braille writing skills. The Perkins Brailler will need to be regularly serviced so a Perkins Brailler repair service will need to be established.

Equipment for a resource centre (providing outreach services for schools and children and their families)

The resource centre should have examples of all the assistive technology recommended for blind pupils, pupils with low vision and the classroom teacher (see above), as this technology can be used for training and demonstration purposes.

For producing braille texts, the centre should also have a **computer** with a dedicated **embosser** and **translation software**.

For producing raised diagrams and maps, the centre should have a **computer**, a **heat-infuser** (**thermoforming machine**) and **swell paper** for producing raised diagrams and maps.

The necessary arrangements should be made to ensure that this equipment is properly maintained and stored once purchased. It is recognised that these issues can be challenging in some sub-Saharan African contexts.

Looking to the future: mobiles, smartphone and computers

Access to the internet through **smartphones** and **computers** will increasingly become normal over the coming decades throughout the world, including sub-Saharan Africa.

A blind girl in Sierra Leone touch-typing using a computer with 'text-to-speech' software. © Sightsavers/Peter Caton.

As with all specialist equipment, the accessibility software necessary for computers or smartphones can sometimes be extremely expensive. However, often very capable software is built into the system, or free, open-source alternatives are available online. For instance, screen-reading software (which reads aloud the text on a computer monitor) is built-in to almost all Android smartphones, and can be downloaded for free on Microsoft Windows computers, with the NVDA open-source software package.

Once these devices are set up for pupils with visual impairments, they can access an enormous amount of material available online, and also tools which allow them to read, communicate, and write documents independently, on the same level as their sighted peers.

Contact us

If you have any questions about this report or would like to find out more about Sightsavers' work in education, please get in touch with Guy Le Fanu at:

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