

Inclusion of low vision services in existing eye care and education services in seven regions of northern Tanzania

Report on the results of a three year pilot

Karin van Dijk, December 2009

I. Introduction and summary of achievements and challenges

In 2004 an assessment was made to investigate if and how low vision services could be integrated into existing eye care / VISION 2020 programmes with emphasis on children in 12 Annexes/blind schools and 5 ITPs with over 200 children with low vision (2006 estimate) in seven regions in Northern Tanzania (1). KCCO developed a project proposal named "Provision of low vision services for Northern Tanzania: Creation and implementation of a systematic approach to service delivery and modeling for eastern Africa" (2). This was accepted for funding by Dark & light Blind Care.

The main aims listed were:

- Improve the visual capacity and quality of life of children with irreversible low vision or blindness in northern Tanzania.
- Assist partners throughout eastern Africa to develop the strategies necessary to include low vision care within VISION 2020 programmes

This report will concentrate on the first aim. Fulfilling the second aim will be an outcome of the three year pilot and is planned for 2010 and 2011 (see recommendations at the end).

The objectives of the project relating to the first aim are as follows:

1. Creation of an infrastructure for the inclusion of low vision services in VISION 2020 programmes in the regions of northern Tanzania.
 - a. Include in regional programmes in a stepwise manner.
 - b. Include collaboration with Ministry of Education at each stage of implementation to promote integration.
2. Enrol at least 100 children into a low vision service in year 1, increasing to 200 children in year 2 and 300 children in year 3.; assess 50 adults in year 1, 100 in year 2 and 150 in year 3 (through the low vision clinic in KCMC and the CBR)
3. Provide comprehensive low vision care to children, including surgery, clinical and optical assessment and training, and vision related functional and educational follow-up and training.

4. Develop an inclusive approach regarding children with low vision, by promoting education and rehabilitation in local, mainstream programmes and schools

The activities planned to realize these objectives as listed in the original proposal are listed in Appendix 1.

Meetings to inform stakeholders such as the relevant eye care and education providers in the regions, non governmental organisations and ministry staff at national level were undertaken at the end of 2005 and in the first half of 2006. These stakeholders were kept informed throughout the years.

In October 2006 the first training in low vision of the regional optometrists in the seven regions took place. This event is seen as the start of implementing low vision care in the regions. Relevant regional eye care staff and education personnel of schools where children with low vision are being educated were trained, monitoring visits and protocols made, interventions such as glasses prescribed and dispensed, records and data collected. Two national meetings of stakeholders took place respectively in October 2007 and June 2009.

This report describes the results of three years (October 2006-October 2009) of including low vision services for children into existing eye care and education programmes in Northern Tanzania.

Main achievements are that most children:

- Have had at least one eye examination,
- Have been prescribed glasses (and at least two thirds obtained them),
- Are using print when appropriate
- Are seated in the front of the classroom and/or near light.
- Around 200 (student) teachers were trained in basic low vision in addition to 9 optometrists.

Main challenges relate to making services systematic and regular, ensuring regular monitoring, and attention to quality. This relates to the following activities:

- Improving regularity and quality of monitoring progress
- Making eye examinations annual and regular
- Ensuring all children obtain glasses
- Increasing prescription and use of magnification and non optical devices
- Ensuring accurate record keeping and use

Improving services needs to be done with increased cooperation with education authorities, who also gradually need to assume responsibility for facilitating transport for eye checks and glasses / devices, in addition to monitoring progress at Annexes.

II. Situation at the end of 2006

Regional optometrists hardly ever visited Annexes or had much experience in refracting children. A few children did receive an eye examination by going to the regional or district hospital themselves, but there was no system of regular eye examinations. Tanzania Society for the Blind (TSB) staff visited some Annexes to give advice and occasionally devices but they did not facilitate clinical eye examinations on a regular basis.

Visits made to Annexes late 2006 and early 2007 (3, 5a, 5 b) showed the following:

- 1) There is no systematic, regular contact between the nearest eye care facility and Annexes.
- 2) Children are rarely assessed by eye care staff before enrollment in Annexes; indeed some children have never had an eye examination despite being in the Annex for years. School records hardly ever show any evidence of results of eye examinations.
- 3) Confusion about the input in terms of resources and monitoring visits by the Tanzania Society for the Blind (TSB). It was at that stage unclear what TSB provided to selected Annexes in terms of glasses and devices and on what clinical assessment it is based.
- 4) Very few children were seen wearing distance corrections; hardly any using magnifying devices.
- 5) Teachers learn during their training that use of remaining vision is not to be encouraged; many teachers were trained more than 10 years ago.
- 6) Teachers do not know what low vision means (compared to blindness and normal vision) nor what interventions might be useful (different from blindness) for children with different eye problems, such as albinism, aphakia, pseudophakia and the like; There is little awareness of the need for early eye examinations.
- 7) Most children with low vision learn Braille in class 1 and 2 regardless of their vision levels.
- 8) The Ministry of Education and Vocational Training (MoEVT) provides services for 'blind' children and does not seem to differentiate between low vision and blindness; the number of children enrolled are all listed as blind

III. Activities undertaken to include low vision services in regional eye care and education of children with visual impairment

1. Training and meetings

Coordinator

The KCCO Childhood Blindness and Low Vision Coordinator (CBLVC) received training in low vision in India for 2 weeks, attended trainings of optometrists, learned by working with the educational specialist of Visio/Sensis and by working with the visiting low vision specialist.

Eye care coordinators and optometrists

MoH Regional Eye Coordinators (comprising 1 ophthalmologist and 6 cataract technicians) were trained by KCCO and KCMC in June 2006 on clinical follow up of children receiving cataract surgery and on the need for starting low vision services.

Seven optometrists, one from each region, and an additional optometrist from KCMC, a large tertiary hospital with a low vision clinic, were trained several times, using both external and internal facilitators. It was recognised that they needed to be upgraded in refraction skills and in clinical low vision. Most optometrists work either in regional government hospitals or in NGO/ private hospitals.

Table 1: Training dates and topic of optometrists

Dates	Kind of training
17-21 Oct 2006	Basic clinical low vision
10-14 Sep 2007	Refraction and retinoscopy
Feb 25-28, 2008	Upgrading clinical low vision care
Nov 5-6, 2009	Evaluation meeting together with teachers

The optometrists who did not have a retinoscope received them through funding of Visio.

- KCMC

Before the pilot programme one of the optometrists at KCMC hospital was assessing children with low vision. The assessments were not always complete and there was no system to ensure children obtained glasses and/or devices. Halfway through the pilot programme KCMC had a new optometrist trained in low vision in India. The system of assessments and the obtaining of glasses have improved. KCCO facilitates glasses and low vision devices for most children in Annexes in Kilimanjaro region with reimbursement by TSB. This system is not always working well; from 2010 reduced TSB funding might further jeopardise this service.

- Optometrists in other regions

In 2008/2009 Manyara and Arusha lost their trained optometrist (transferred elsewhere), while in 2 other regions (Mara and Mwanza) the optometrists are fairly inactive in relation to providing a full clinical low vision assessment.

Education and teachers

From October 2006 onwards close cooperation between the education specialist of Visio/Sensis and KCCO's low vision programme was established to strengthen technical input into educational services

- Teacher training

Staff at all annexes were provided a one day training on the need for eye examinations, need for wearing glasses if prescribed, use of vision with emphasis on print use and basic teaching strategies in the classroom. This took place between end 2006 and 2007 (except for one in October 2008). The majority of teachers of each school attended. Appendix 2 shows dates of training, and number of teachers trained. In 2009 46% of the teachers trained were still at their respective schools.

The training was generally planned after a first visit by the optometrist to the Annex in order to ensure that some children already had their 'best' vision before training their teachers. The trained optometrist of each region joined the training at 'their' Annex so the educators and eye care professional could meet and plan for more eye examinations.

In addition four selected Annexes (2 in Kilimanjaro region, 1 in Singida and 1 in Shinyanga region) received a 3 day formal training (Feb 28 - March 1, 2008) at KCCO covering the same topics addressed in the one day training, but in more detail. Anecdotal evidence suggests that the understanding of the teachers on which children to teach print was better after 3 days training.

- Including low vision into special teacher training for visual impairment at Patandi Teacher Training College.

For the last three years facilitators from KCCO have been going to Patandi to teach and student teachers from Patandi have been visiting KCCO/KCMC for learning. Based upon the 1 and 3 day trainings a short teaching module has been developed for inclusion in the Patandi diploma and certificate courses. Marianne Kooij is finalising the modules with input from all concerned. It is vital that future teachers get the correct information and skills relating to low vision. It has proven to be difficult to get regular, scheduled sessions at the college, but the efforts are ongoing and will continue.

CBR

In 2007 contact was made with the CBR programme at Kilimanjaro, which falls under CCBRT in Dar es Salaam, and training was given to CBR workers. Due to the fact the programme was not functioning well, there were few referrals. The programme has now been restructured, now working mainly with clients with multiple special needs.

Recently it has been agreed with CCBRT Moshi to do a low vision training in 2010 after evaluating the level of low vision knowledge and identifying the need of the CBR personnel for further learning.

Joint meetings with stakeholders

- National stakeholders meetings

Both meetings were jointly organized by the Ministry of Health and Social Welfare (MoHSW) and the Ministry of Education and Vocational Training (MoEVT), together with KCCO. The second meeting was also supported by CBM.

The first meeting concentrated on mapping current eye care, education and rehabilitation services in Tanzania relating to finding and/or giving services to clients with low vision. In addition a SWOT analysis of the current (2007) low vision care in Tanzania was undertaken. The second meeting in June 2009 reviewed evidence of good practice and looked at strategies and partnerships needed to improve services.

The reports of both meetings were shared with the participants. The two Ministries received draft guidelines for admittance for children to annexes with emphasis on including children in local schools. The MoEVT is finalising their inclusive education policy. The draft guidelines can feed into this and into the national eye care policy of the MoHSW.

The need for eye examinations before admittance to schools for the blind or annexes and the benefits of using print, when possible, are clear at the national level, as is the need to distinguish between blindness and low vision.

- Joint review meeting with optometrists, teachers and KCCO

In November 2009 a 2 day joint evaluation meeting with all optometrists trained (and still working in low vision = 5 of the 9) and key education staff involved in the work at Annexes was held to collect information on work done, list achievements and challenges (7).

2. Monitoring

Over 2007-2009 monitoring visits were made by KCCO staff (and the regional optometrists) to the Annexes, generally one per year. In addition some optometrists would visit separately. Appendix 2 shows that most Annexes received a minimum of 2 visits.

The KCCO CBLVC and Vision/Sensis educator focused on classroom management and assessed glasses and non optical devices used. Visits made by the low vision consultant concentrated more on quantity and quality of eye checks and clinical interventions prescribed, obtained and used. Records were reviewed during all visits, in particular the advice given by the optometrist to the teachers to ascertain if it was well given / well understood.

Midway through the programme (March 2008), an estimated 80% of children in the Annexes and ITPs had received a basic eye check and/or clinical low vision examination. Around 40% of the children who had been prescribed glasses had received them.

IV. Results of and changes in low vision care for children in the Annexes

1. Work of optometrists

Over the three years an increasing number of children with low vision are consistently being refracted and glasses prescribed. Improvement of distance vision is well recorded on most clinical forms and on advice forms for the teachers. In a few cases the distance vision on the advice form was not the best corrected one, leading to confusion. Near vision sizes were not recorded in 37% of cases. Accurate recording of distance and near vision levels is important as advice for learning in print/Braille and for the kind of school (local / Annex) is mainly based on these data. A new version of the advice form will be used from 2010 onward to help this process.

2. Data analysis and numbers of children

- Annexes / Itinerant Teaching Programmes (ITPs)

At the end of 2006 there were reportedly 155 children with low vision and 156 with blindness in the 10 Annexes (Mwanza not included). Children in Itinerant Teaching Programmes (ITP) were not included.

These numbers were given by teachers who often regarded children with very little vision as blind at that time and before many of the children had had an eye examination.

In the recent evaluation meeting held in November 2009 teachers reported (2 Annexes in Mwanza and its Itinerant Teaching Programmes excluded – see

next paragraph) 205 children with low vision (60%) of a total of 339 children with visual impairment in the Annexes (Children in ITPs were not included).

A total of 222 records (209 records of children at 10 Annexes and 13 records of children at 3 ITPs) who were assessed between end of 2006 and end of 2009 were analysed for socio demographic, clinical and learning media results. Almost all of the children admitted to Annexes up to early 2009 are therefore included. Overall an estimated 82% of children currently in the Annexes are included in the data presented (after taking out the 5% who left school in 2008). Most of the 47 children not included were admitted to the Annexes later in 2009 and records could not be obtained yet.

Data relating to the first eye examination for the 222 children was entered; clinical (low vision) records and advice forms for teachers could be traced for all. Other clinical and educational information was extracted from hospital records, from various follow-up visits over the 3 years, and from interviewing teachers. For 67 of the 222 children results relating to the second and/or most recent eye check were available and entered.

All regions, except Mwanza, are included, giving a total of 10 Annexes and 3 ITPs. Mwanza was excluded as the data is not current and incomplete, due to a recent, very large, increase of children with albinism to one of the Annexes (low vision or not).

The socio-demographic and clinical data cannot be presented consistently for all 222 children due to the fact many records had some information missing. The majority (42%) of the children (and records) are from Kilimanjaro, which has 3 Annexes and 1 ITP. Most of the missing records relate to Annexes in Shinyanga and Singida. Appendix 3 shows the numbers of children per region.

- KCMC

The original aim was to assess an increasing number of adults with low vision at KCMC. Due to turn-over in staff (the optometrist and the ophthalmologist responsible for supervision), numbers are currently unknown.

- The overall aim to assist 300 children

The original aim to assist 300 children with visual problems by year 3 has been achieved, as children in local schools also benefited from the new expertise of the optometrists (see section 9) in addition to the children in the Annexes and ITPs.

3. Records

For the first eye check we traced 54% of the clinical low vision records and 45% of advice forms provided by the eye care staff to education staff. For a quarter of the children we obtained both forms.

For the last eye check (67 children had a second/last recorded eye check) 49% of the clinical records were traced and 66% of the advice forms. We obtained both forms for 40% of the children.

This is an encouraging increase in advice forms. The target, of course, should be 100% as the information on these forms is vital to give the child and school guidelines for an appropriate education based on optimal use of vision.

4. Age, sex, year of entry in the Annex and number of eye examinations

Data on age, sex and year of entry into the Annex shows that children often start school at a later age and/or duplicate classes; 67% of those older than 12 years were between preschool and grade 4. Only 40% of all children are girls. UNESCO estimates that similar percentages of boys and girls attend primary school.

Table 2: Sex, age, year of entry into the Annex/ITP and eye examination details

Variable	Description	%
Sex	Female	40
Ages	4-12 years	44
Year of entry in Annex (n = 148)	Before 2007	68
Year of first eye check	2007 onwards	79
Number of eye checks	1 or more	94

Detailed information regarding the **eye examinations**:

- 96% of children in the Annexes have now had at least one eye check. In most cases this included refraction.

It is reported that 90% of the newly admitted children in 2009 had an eye check, but we were not yet able to see most of the relevant records.

- 30% of children had more than one eye check; children in Annexes in Kilimanjaro were 2 times more likely (OR 2.0; CI 1.1<OR<3.9) to have received one or more annual eye checks compared to other regions. KCMC hospital has an optometrist who does a lot of low vision work and there is an optometrist in the government hospital in Moshi. In addition KCCO is based in Kilimanjaro: more monitoring is done in this region than in other regions that are further away.

- Close to 80% of children received their first eye check from late 2006 /early 2007 onwards, the time the low vision programme started; 68% of these children were already in the Annex one or more years before 2007; yet only 1/5 of these children received an eye check prior to 2007.

Children in Itinerant teaching programmes do not always seem to be included in eye examinations. In two ITPs at least one third of the children had normal vision and seemed to be visited by an ITP teacher because they had, at some stage, conjunctivitis, did not have 6/6 but had 6/12 or had one eye with good vision.

Some of the optometrists who checked ITP children (and found they had normal vision) did not seem to have emphasised that the children did not need support from a special teacher; therefore the headmaster and special teachers themselves did not always seem to realise they were supporting a child that did not need the support. In other instances the children were possibly kept on the list to increase their numbers.

During follow up visits and the evaluation meeting in November 2009 teachers said that they now see an eye examination as a necessity

5. Causes of low vision, distance vision and glasses

Causes of low vision indicate that refraction and possibly magnification is an important intervention.

- 28% of children had albinism
- 23% had lens related causes: of these 48 children 80% had pseudophakia
- Overall 24% had nystagmus in addition to the main cause; this is likely an underestimate as many records did not record all eye problems.

The children listed under retina, lens and refractive error (about 70% of all children) are likely to benefit from refraction and glasses; of course some children in the other categories also benefit). Appendix 3 shows all causes of low vision.

Distance vision of the children shows most fall in the 'mild' (6/60-<6/18) low vision group. After refraction 21% of the children have a distance acuity defined as normal (6/18 or better).

Table 3: Presenting and best corrected distance visual acuity (VA)

Distance vision	Presenting (n=184) - %	Best corrected (n=189) %
Light perception/hand movement	11	10
> LP - < 3/60	13	8
3/60 - < 6/60	13	10
6/60 - < 6/18	51	51
6/18 or better	12	21

Note: 38 presenting (17% of total) and 33 (15%) best corrected VAs were not recorded.

The data on the 67 children who had a second/last eye check shows higher percentages of 'mild' low vision and normal vision:

- 53% of the children have a presenting vision of 6/60 – 6/18
- 19% have normal vision at presentation; after refraction 30% have normal vision.

The fact that vision has improved can possibly be explained by the fact that more children were using glasses at the time of the second/last eye check.

Children with **normal vision** are found in all Annexes (except one) and ITPs.

- Causes of vision problems listed for children with normal vision before refraction are divided over all causes, but occur more in children listed with myopia, albinism, pseudophakia and corneal scars.
- After refraction the largest group includes those with myopia (30%) followed by those as having corneal scars (16%). Albinism and pseudophakia each account for 11% of cases.
- 84% of the children with normal vision were admitted before 2007. (n=19; there are 23 children with normal vision at presentation)

These findings illustrate that children are admitted to Annexes without prior eye examination (especially before 2007), are kept in the annexes (also from 2007 onwards, and even a good visual outcome following cataract surgery and/or refraction.

Table 4: Prescription and obtaining of distance corrections

Variable	Description	%
Distance glasses first eye check; n=214	Has them already	12
	Prescribed	37
	Obtained	48
Distance glasses last eye check; n=66	Has them already	30
	Prescribed	36
	Obtained	63

It is encouraging to see an increase of glasses obtained over the 3 years. There is not enough information to know if the children use the glasses obtained. Teachers reported in the November 2009 evaluation meeting that 27% of low vision children have glasses.

6. Near vision, magnification and learning media

In their training the optometrists have been taught to measure near vision and assess and prescribe magnification. They were given magnifying glasses and hand magnifiers between 6.0 and 12.0 D. They also learned the relationship between near vision, grade in school of the child, and learning medium.

Information on near vision and assessment of magnification was not complete. Only for 63% of children near vision was recorded. The advice forms also often lacked information on near vision; this is vital to give advice on print or Braille use.

Table 5: Presenting near visual acuity: size and distance; n =139

Near vision	Presenting %	Working distance 10cm or less %
0.8- 1.25 M=normal vision	62	35
1.5-2.5 M = large print	28	50
>2.5 M	10	71

Note: When removing the children with normal vision at presentation (i.e looking only children with low vision) near vision levels are still (close) to normal near vision:: 58% with 1.25 M or smaller and 31% with large print size.

- Records show that 9% of children (21) were prescribed magnification, and that 9 children received it. There is no reliable information on its use.
- It is estimated that about half of the children would need assessment for magnification, based on an analysis of the standard/grade the child is in, the near size and working distance
- Most children would benefit from low to medium power

At the time of the second eye check 15% (10 of the 67 children) were prescribed magnification and 4 received it. Considering the fact that a higher percentage had mild – normal vision levels in the second/last eye check, there is an increase in magnification assessment. Around 30% of this group would need magnification assessment.

Very few telescopes were prescribed (10) and 2 children received them. Only KCMC hospital can prescribe and dispense them at the moment. Reading books and writing are considered priority skills at this stage of the programme in order to ensure that a child with low vision can enter school. Therefore telescopes were not included in the training of optometrists.

At the end of 2006 the majority of children with low vision used Braille as their primary learning medium. The findings are now:

- Children that entered the Annexes from 2007 onwards are more likely to be using print compared to those that entered before 2007 (64% vs. 51%), but the result is not statistically significant.
- In the recent evaluation meeting teachers reported 58% of the children with low vision (in the same Annexes as above) are using print (close to the 64% listed above)
- 78% of children that were advised to use print after eye check are using print (results of 114 of the 222 children). This percentage did not change significantly after the second/last recorded eye check

- When analysing the recorded near vision levels, over 20% of children are using Braille unnecessarily.
- The advice given by the optometrists for print or Braille makes sense when looking at near vision levels.

Considering the fact that most children with low vision were using Braille before 2007, the use of print has increased greatly. In most Annexes the habit of teaching each child with vision problems Braille in standard 1 and 2, regardless of vision levels, has stopped.

Many teachers now consider print use by children with low vision as a 'normal' procedure. There are some teachers who still teach Braille as a secondary medium after print 'just in case vision will be lost later'.

7. Transport to eye care and obtaining of glasses and optical devices

From early 2007 onwards the trained optometrists visited the Annexes to assess children. These visits were dependent on availability of transport, time and cooperation by the regional eye care management. All optometrists visited Annexes but were not always able to finish (e.g. refraction of all children, and often left out magnification assessment).

In order to make eye examinations more complete and systematic attempts were made to encourage district education authorities and/or the school authorities responsible for facilitating transport of children to the eye care facility where there is an optometrist trained in low vision. This was successful for 4 of the 10 Annexes in 2009. KCCO contributed in the case of 2 Annexes, while parents now contribute in 1 Annex.

At the end of 2006 TSB paid for glasses and devices for children in 6 of the 10 Annexes (through KCCO), while KCCO assisted the others if parents could not contribute.

Some of the regions such as Singida, Manyara and Kilimanjaro have improved dispensing of glasses to the children, either through better coordination with KCCO or through support of local organizations. Other regions such as Mara and Arusha do not yet have a system of regular eye checks or a system to ensure children obtain glasses.

In discussions with district education authorities it became clear that they are willing to fund transport to eye care and glasses for children in Annexes if budgeted well in advance by the head of the school.

8. Non optical interventions and classroom management

There was no written, systematic advice on use of non optical devices by the optometrists. Therefore there is little data from records. Observations made during follow-up visits by KCCO and Visio/Sensis staff are that:

- More children with albinism wear caps, and long sleeves/ trousers and some use sunglasses.
- Many children with low vision are seated in the front of the classroom and/or near light.
- In some Annexes blackboards have been repainted to create maximum contrast and are cleaned daily: this improves learning for all children.
- Dustless chalk (which also creates better contrast) is now common in most Annexes.
- Use of stands in the classroom or in the resource room was rarely seen. Report of teachers list 15 stands used by 205 children
 - o In some instances teachers reportedly have been told not to let the children use stands as it is 'stigmatising'.

The following challenges remain:

- Children with low vision using print often have no schoolbooks to use, as there is, on average, 1 print school book for 4-5 children in a class.
- Files with advice forms on the needs of the child with low vision seem not to be used very often. Therefore the special teacher forgets about or is unaware of the needs of the child after eye examinations. This results in classroom teachers not having knowledge on the needs of the child, such as the need to wear glasses continuously.
- Teachers still have very little idea about the practical implications of the main causes of low vision: for example aphakia and the need for wearing glasses continuously
- Both special and general classroom teachers seem to feel little urgency to ensure children wear their glasses or look after them and they do not always understand that it can take time for children to get used to them.
- The special teacher VI often does not seem to know about the child with low vision's seating, use of glasses, use of print and the like, in the general classroom. There seems to be no regular visit (e.g. to give advice / follow progress) to the child in the classroom and/or its teacher by the trained special teacher VI (based in the resource centre/ Annex at the school).

In collaboration with Mwereni school in the Kilimanjaro region the KCCO coordinator and Visio/Sensis educational specialist have recently started a trial programme by developing a communication form for teachers to be able to manage and monitor the needs of the visually impaired children in class.

9. Clinical low vision assessment of other children (not in Annexes)

A benefit of the low vision programme is that children from local schools now also can get better refraction and glasses if needed. It is estimated that a minimum of 150 clients benefited over 3 years, mainly from Kilimanjaro and Shinyanga regions. 92 records from 5 regions were analysed:

- 43% are primary school children, 41% secondary school children
- 43% are female
- 39% had refractive errors, 20% had albinism
- 77% presented with a VA between 6/60 and 6/18; half of them improved to normal vision with glasses
- 89% were prescribed glasses, the vast majority for myopia
- 4% was prescribed a magnifying device and 10% a reading addition (bifocals) although near vision measurements show that an additional 10% might have needed near vision improvement.

KCCO received only a few requests to assist with funding of glasses for these children.

V. Guidelines/ protocols developed over the 3 years

One aim of the pilot programme was to develop guidelines and protocols that can be applied in other geographical areas in (east) Africa. The following have already been developed:

- Guidelines for sequencing eye check/clinical low vision assessments, facilitating interventions needed and teacher training
- Monitoring spreadsheets for the low vision coordinator and Visio/Sensis educator
- Checklists for monitoring/ follow-up visits: clinical work; education/CBR
- Guidelines for referral of children by eye care to Annexes/schools for the blind
- Admittance guidelines (national) for children with low vision to appropriate educational facilities
- Guidelines for supervision of low vision optometrist at KCMC
- Guidelines for prescribing glasses and magnifying devices
- Guidelines to ensure children obtain glasses and optical/non-optical devices, through regional eye care, KCCO, TSB and others
- Recommendations to ensure all relevant reports are copies to district, regional and/ or national eye care and education authorities
- Suggested basic low vision outcomes: For KCCO; for regional eye care/optometrists

All of these will be updated where needed and become part of a manual for including low vision care in district and regional eye care and education services and will form reference materials for training courses to be held in late 2010/ 2011.

VI. Costs

The relevant information relating to costs of the pilot programme is not available yet. This section will be written once the information is available.

VII. Recommendations

The original aims of the pilot programme have been achieved completely (numbers of children assessed) or partly (comprehensive low vision care including use of glasses/devices), as described in the sections above. The situation as it was at the end of 2006 (see section II) has changed for the better.

In order to improve and increase an inclusive approach regarding children with low vision and ensuring systematic access to eye care and clinical low vision services and promoting education and rehabilitation in local, mainstream programmes and schools, a number of recommendations are listed below. These relate both to the current programme in northern Tanzania, the proposed programme in selected regions of southern Tanzania and to the development of guidelines for programmes throughout (eastern) Africa.

Records and monitoring

- Systematic and regular monitoring of results of the assessments of individual children by optometrists and the implementation at school of the interventions recommended:
 - More technical input is needed to monitor progress – an optometrist should preferably accompany the KCCO coordinator
 - There are a growing number of special needs coordinators being appointed at district level. In future, they need to be taught to monitor timings for eye examinations and the interventions prescribed and used in the school as well as the learning media and progress of children with low vision. They need to be involved from the start, in close cooperation with district/regional education authorities
 - Detailed information needs to be systematically collected: e.g. list of children with key data like eye check done, glasses prescribed/used, print/Braille; these need to be obtained every 6 months – per Annex and ITP
 - Provide an overview of eye checks and interventions (glasses, print/Braille, vision levels) needed per Annex to the Headmaster, special needs coordinator and District Education Officer,/ and in addition to the regional eye care coordinator

- Improvements in completeness and consistency in filling in all of the required information, in keeping and in using of records by all concerned. This relates to clinical low vision forms, advice forms, progress records of teachers and information and data collected during follow-up visits.
- KCCO needs to consistently inform district, regional and where appropriate national education and eye care authorities about planned trainings, follow-up visits and the like.
- Optometrists in the regions and key education staff need to receive a summary of the results and of the recommendations that relate directly to their work
- Regional optometrists need to inform their regional eye care coordinators of all low vision related work and give feedback on the results, as it should be part of their regular regional eye care activities and be reported in their annual reports.
- Mapping of human resources, programmes and access to funds in each region needs to be updated continuously, as situations change
 - In some cases optometrists who are a member of TOA (Tanzanian Optometry Association) could be part of the low vision service
 - There are inclusive education programmes being developed where children with low vision/visual problems might be placed; The role of the special needs coordinator will be crucial
 - There are schools where children with intellectual impairments are being educated: they all need an eye check and refraction, and a small percentage will be low vision

Eye examinations and optical interventions

- Encourage education personnel to take responsibility for timely, annual eye check-ups and optical interventions for both new and follow-up children with visual problems.
 - Costs for transport to nearest eye care trained in low vision and for obtaining glasses/devices prescribed can be added to the annual school budget by the Headmaster, who sends it to the DEO. The education authorities have indicated they would be willing to fund this if requested and indeed already do so in a few instances.
 - An amount of 20.000 Tsh per year is advised per child with low vision in the Annex and in the ITP to cover glasses, hard cases and magnifiers
 - Transport costs need to be calculated locally
 - Contributions from parents can be obtained by the school by giving parents letters with both the advice form and the costs made at the time they come to pick up their children

- Encourage eye care to enquire every 3 months if any new children have arrived and if glasses/devices prescribed have been obtained
- Eye care staff needs to continue to assist in obtaining correct distance glasses and in stocking and selling magnifying devices
- Where needed, eye care should continue their efforts to assist in facilitating funds for glasses and devices
- Encourage eye care to check their records annually to see who needs a re-check and to contact the Annex to facilitate this.
- A revised advice form has been developed and needs to be sent in Swahili to all optometrists with an accompanying letter to encourage accuracy and completeness when filling in these forms for education.
- Optometrists should ensure that every child with low vision assessed and his/her teacher receives a complete advice both orally and in a written format (advice form).

Technical input for optometrists

- Refresh optometrists in the need for magnification assessment and prescription, accurate record keeping and explaining results to clients and teachers:
 - Expand the range of magnifying devices to include stand magnifiers and to extend the range of magnification to 20 or 24 Dioptres.
 - Where possible, prescription of telescopes can be added, once magnification assessment and prescription for near tasks is well established.
 - Fill in all clinical results for both distance and near vision on clinical low vision and advice form.
 - Extend efforts to give clear advice on use of learning media, as there are still 20% of children with low vision using Braille unnecessarily
 - Optometrists should continue to advise non optical interventions with emphasis on sunglasses / tinted glasses; the other non-optical interventions, such as stands, reading slits and seating position can in addition be directly suggested and implemented by the teachers.
 - The advice regarding children with normal vision found in the Annexes needs to be precise: children can stay in the school but do not need the attention of the special teachers.

Technical input for teachers / special needs coordinators

- If children use the glasses and devices they were prescribed is often not recorded and/or the teachers of the child do not always seem to be aware if and when the child should be using them; special teachers and classroom teachers need to be reminded on the importance of use of prescribed interventions
- Non optical devices need to be used more systematically; it is recommended to give key teachers more skills to assess what non-opticals are needed by an individual child as optometrists have less time and do not know the situation in classrooms.
- There are still 20% of children with low vision using Braille unnecessarily: teachers need to be reminded of the importance of vision use and the ability of most children with low vision to keep using vision over the years.
- Provide training to special needs coordinators on low vision in all aspects: technical input and monitoring skills
- Monitoring is only possible if both eye care and education keep simple records and use them; this needs more attention during all trainings and during follow-up visits.

Training / meetings

- The following sequence of informing and training staff is recommended when starting work in a new district:
 1. Meeting with regional / district eye care and education staff (including special needs coordinator) on the need for low vision services and ways to include it in the current eye care and education services. National level staff of the Ministry of Education and Vocational Training needs to be invited to the first meeting.
 2. Optometrists – training in technical low vision skills, record keeping and organisation of regular assessments and interventions
 - Guidelines for selection are needed: the optometrist needs to be able to assess children as part of their routine work
 - Train more than one optometrist per region if needed
 - Map location of Annexes and optometrists, and decide where children can go for assessment: this might be in an adjacent region (Not every region might need an optometrist trained in low vision at the start of a programme); for example Patandi Annex in the region of Arusha can visit KCMC in Kilimanjaro

- The special skills of optometrists in low vision need to be recognised in a formal way by the Ministry of Health; the need for clinical eye care staff with technical low vision expertise is listed in the long term eye care plans of the Ministry.
3. Organise assessments and interventions needed of a first group of children (minimum 10)
- Education staff need to make the arrangements, in close cooperation with eye care
 - Eye care in the role of facilitating activities to ensure clinical/ technical interventions are obtained

Once children are clinical assessed AND glasses and devices obtained (within 4-6 weeks of training optometrists), training of education staff and teachers at Annexes need to take place:

4. Teacher training
- a. Train key staff (special teachers and special needs coordinators); 3 days is recommended. As some of their children will already have their 'best possible vision" these children will be discussed during training.
 - b. Train headmasters in some formal way (they can join 3 days or last day of training)
 - c. Afterwards with the help of key educational staff trained train classroom teachers at the school (1 day).
- Education authorities/ special needs coordinator needs to check if optical interventions are obtained and used
 - As stated before: special needs coordinators should be the ones to monitor the educational side in close cooperation with district/ regional education authorities
- The one day training at schools for all teachers is held to ensure all teachers who teach a child with low vision receive basic skills. As turn-over is quite large, this process might need to be repeated every 2 years. Once special needs coordinators have more skills they can act as trainers, with key education staff trained for 3 days, together with the regional optometrist.
 - Training of key staff (special needs coordinators/ heads of VI units, optometrists) should not be a one time event, but based on results of monitoring, upgrades need to be planned every 2 years. It can be in the form of joint evaluation meetings and/or formal training

- Continuing input in training special teachers at Patandi teachers training college, based on current module developed is recommended to ensure new teachers have basic low vision skills
- Development of Tanzanian trainers in clinical low vision and education of children with low vision needs to be planned and implemented over the next 3 years.

Policy development

- Advocacy needed at national level of education to implement an admittance policy: it is a must to make meaningful changes in education of children with low vision
 - Karin van Dijk will remind education staff at national level by email and resend the admittance policy
 - The KCCO coordinator will make a visit in early 2010 to get an idea of the progress at the special needs unit of the Ministry of Education and Vocational training.
- The need for print school books for every child with low vision that can use print needs to be emphasised as part of the policy.
- Success stories of individual children with low vision who are using print and could be included in locals schools, when the inclusive education policy of the MoEVT gathers momentum, need to be shared with both district, regional and national education authorities.
- The national eye care policy/strategic plans need to take the admittance policy and inclusive education policy into account .

Formalizing guidelines for including low vision care in district eye care and education services

- In 2010 all lessons learned and protocols developed in the three year pilot in Northern Tanzania (see section V.) need to be formalised into a (training) manual in order to assist partners throughout eastern Africa to develop the strategies necessary to include low vision care within VISION 2020 , eye care and education programmes. This will be used to:
 1. Establish the programme in southern Tanzania,
 2. Assist DLBC (and other NGO) partners in eastern Africa, and
 3. Assist other interested African partners

Appendix 1: Activities planned in original proposal to achieve the objectives set

1. Hire and train a low vision coordinator based at KCCO.
2. Develop guidelines for the management of children with low vision in northern Tanzania.
3. Develop a “child-centred” system for case management for individual children with low vision in northern Tanzania
4. Order low vision devices for distribution to children who need them (provision under a subsidy may be needed for some children).
5. Create a low vision resource centre within the Ophthalmic Resource Centre for Eastern Africa (ORCEA) and initiate periodic communication.
6. Train staff from the Kilimanjaro CBR project, optometrists from targeted regional hospitals, and teachers in schools for the blind/annexes, and others in their role in low vision services.
7. Set up and maintain a system for monitoring services received progress in integration of children back into local schools, follow up, etc.
8. All children at the 15 annexes and schools for the blind in the project area will be visited and assessed for low vision care. Children needing such care will be enrolled into the programme.
9. A protocol, including follow-ups and material support needed, for all children in local, mainstream schools and programmes will be developed.
10. Conduct operational research on utilization of low vision services to improve quality of existing services as well as to assist other facilities in eastern Africa create their own programmes
11. Conduct workshop (pending funding) of those interested in integration of low vision services into VISION 2020 programmes.

Appendix 2: Number of eye care visits to Annexes, dates of teacher trainings and numbers trained and number of KCCO monitoring visits

Region	Name of the annex	No. eye care visits	Last visit (eye care)	KCCO monitoring visits	1 day Training date	No. teachers trained	No. still at school in Nov 2009	No. teachers 3 day tr Feb 2008
Arusha	Patandi	4	Aug-08	4	Nov-07	12	5	
	Longido	3	Aug-08	3	Nov-07	15	2	3
Kilimanjaro	Same	3	May-08	4	Nov-06	12	3	
	Mwereni	1	Feb-09	6	Nov-06	12	11	
	St. Francis	1	Sep-09	3	Apr-07	11	9	3
Manyara	Basotu /Katesh	4	Feb-08	2	Nov-06	14	1	
Mara	Mwisenge	3	Oct-09	1	Nov-06	11	2	
Mwanza	Mitindo	5	Sep-09	2	Sep-07	14	2	
	Nyanza	0		2	Nov-06	13	7	
Singida	Ikungi	4	2008	3	Dec-07	16	15	
	Kizega	3	Jan-09	2	Oct-08	13	13	2
Shinyanga	Buhangija	5	Sep-09	3	Nov-06	23	7	3
Total		36		35		166	77	11

- Singida: in addition to the 2 Annexes 8 teachers at Ipembe primary school that has a Itinerant teaching programme received 1 day training in November 2006.
- Mwereni Annex which is close to KCCO had 2 additional trainings in 2009.

Appendix 3: Distribution of children over the regions and causes of visual loss

Region	No.	%
Shinyanga	14	6
Singida	28	13
Kilimanjaro	93	42
Arusha	22	10
Manyara	36	16
Mara	29	13
Total	222	100

The diagnosis is presented by listing the site of abnormality leading to visual loss

Cause low vision n=210	%
whole globe	3
cornea	12
lens	23
uvea	1
retina	36
optic nerve	2
refr. error	12
other	10
normal	1
Total	100%

References

1. Report on low vision in Northern Tanzania: investigation of possibilities and proposed development of services. June 2004. Karin van Dijk.
2. "Provision of low vision services for Northern Tanzania: Creation and implementation of a systematic approach to service delivery and modeling for eastern Africa".
3. Observations made from recent visits to 8 Annexes/schools for the Blind in northern Tanzania
4. KCCO annual reports 2005- 2008
5. Visit / training / national stakeholders reports Karin van Dijk
 - a. October 2006
 - b. February 2007
 - c. October 2007
 - d. Feb/March 2008
 - e. June 2009
6. Follow up visit reports E Kishiki/F Shija/M Kooij

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