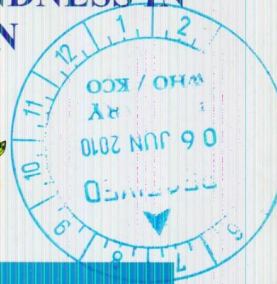


PREVENTING BLINDNESS IN CHILDREN



INFORMATION FOR MEDICAL AND HEALTH WORKERS

MINISTRY OF PUBLIC HEALTH
AND
SANITATION

&

MINISTRY OF MEDICAL SERVICES

REPUBLIC OF KENYA



World Health
Organization

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ACKNOWLEDGEMENT

The manual is an outcome of the efforts of key stake holders in prevention of childhood blinding diseases. The Health Sector is grateful to all the stakeholders for this. We wish to extend sincere thanks to World Health Organization (WHO) and Lions International Foundation (LCIF) for financial support.

We are grateful to the Division of Ophthalmic Services (DOS) under the leadership of Dr. Michael M. Gichangi and team for coordinating the various contributors that have lead to the production of this manual.

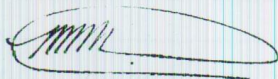
We too extend enormous gratitude to the University of Nairobi for the sustained technical support through the process.

We also acknowledge the parents and guardians of children who agreed to participate in the production of the document.

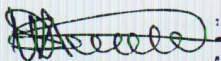
Lastly to our collaborating colleagues and institutions (see annex), who sat at the childhood blindness prevention working groups and gave important technical inputs, it is your conceived experiences and insight that have provided this unique account on childhood blindness.

We believe this document will provide all medical and especially the primary health workers with important information needed to timely address early identification, appropriate referral and management of the avoidable blinding diseases in children.

Thank you,



DR FRANCIS M. KIMANI
DIRECTOR OF MEDICAL SERVICES
MINISTRY OF MEDICAL SERVICES



DR S.K. SHARIFF
DIRECTOR OF PUBLIC HEALTH SERVICES
MINISTRY OF PUBLIC HEALTH AND
SANITATION

FOREWORD

In developing this document, "Preventing blindness in children", the Ministry of Health recognizes this as a significant step in addressing the issues of childhood blinding diseases. The National eye care strategic plan identifies childhood blindness as second to cataract in terms of disability adjusted life years (DALY).

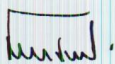
Among the challenges identified to be challenging prevention of childhood blinding diseases includes early identification, poor referral systems and capacity limitations. It's clear that the issues of childhood blinding diseases, are complicated by the fact that they are also strongly linked to poverty and also the under 5 mortality. Worse still, it's felt that awareness among the health workers and the public too, is lacking.

It's suggested that among the barriers to eye care for children is the fact that children usually do not complain of symptoms and also when they are presented by the guardians they pose a challenge to the health workers in terms of evaluation.

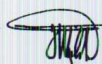
In the document cardinal signs and symptoms are illustrated and further instructions given. It's important for the health workers to follow instructions to the letter to avert blindness, or even Ambylopia (a lazy eye) as early as possible. The document shall be available and accessible to all primary health workers especially those working in the Maternal and Child Health programmes, who are among the first to make contact with the child.

On behalf of the Ministries of Health we wish to thank all who have given up their precious time and skills to realize the development of this document.

Thank You



**Mark K Bor, EBS
PERMANENT SECRETARY
MINISTRY OF PUBLIC HEALTH
AND SANITATION**



**Prof. James ole Kiyapi, CBS
PERMANENT SECRETARY
MINISTRY OF MEDICAL SERVICES**

INTRODUCTION

WHO IS A CHILD?

A child is an individual aged less than 16 years.

A CHILD

- Is the most precious resource of a family
- Represents the family's future and hopes
- A blind child presents special challenges for these families.
- A child whose blindness could have been prevented or cured is an even greater challenge.

75% of Childhood Blindness is AVOIDABLE.

HOW?

By:

- Cleaning children's face daily and maintaining a clean environment
- Giving healthy, nutritious foods rich in Vitamin A and Proteins
- Completing the Immunization as scheduled
- Treating childhood eye diseases early and appropriately

Examination for Eye Disease in Children

History:

- Taken from parents, teachers or guardians
- Use common language and concentrate on relevant details

Questions:

- When did the problems start?
- Was the onset sudden or gradual?
- Is there pain and or redness?
- Is there visual loss or disturbance?
- Other associated symptoms like:
 - o Abnormal head postures

- o Head nodding
- o Double vision
- o Photophobia

Antenatal history of :

- Infections during pregnancy
- Medicines taken during pregnancy

Perinatal history of:

- Premature delivery
- Prolonged labour
- Birth asphyxia
- Exposure to oxygen

Postnatal development-History of;

- Delayed milestones: e.g. delayed neck support, delayed sitting delayed speech, mental retardation, hearing loss and others.
- Childhood infections: e.g. Meningitis, Measles, Malaria, febrile illnesses with convulsion, rickets etc.

Family history:

- Of related eye disease
- Any other disease

Examination:

1. Observation:

(a)Behaviour:

- Banging into objects
- Holding objects close to face
- Grasping objects inaccurately

(b)External abnormalities:

Head:

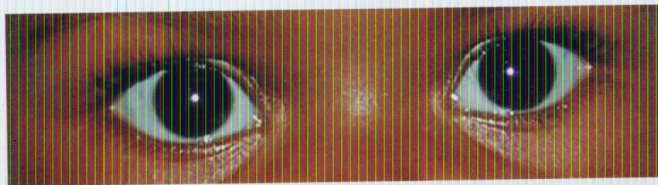
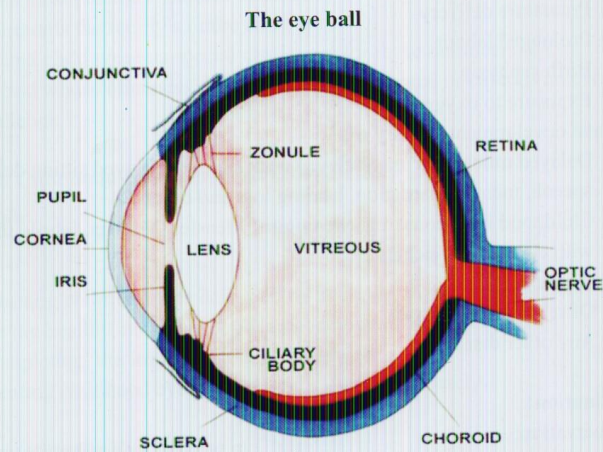
- Shape and size
- Head turns and tilts
- Chin elevation or depression

2. Any associated systemic problem.

3. Vision assessment to determine whether vision is defective:

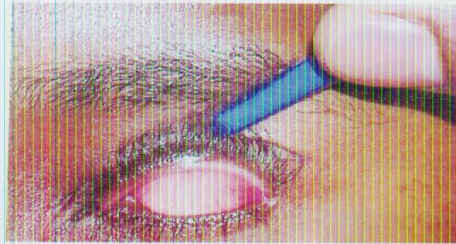
- For older children use vision assessment charts
- Observation of young children/infants; - use a light source (torch)
or bright objects (toys)

4. Eye Examination



Normal eye

- The eyelids should open and close easily and properly. The eyelashes should point outwards
- White part of the eye (sclera) and overlying conjunctiva is white
- The cornea is bright and clear. If pupil and iris (black part) are seen clearly it confirms the cornea is clear
- The pupil is black and round.
- The normal everted eyelid is pink and the small blood vessels are clearly visible. The surface (conjunctiva) is clear, smooth and shiny



Everted eyelid

Child's Eye Is Not a Small Adult's Eye

- Children are not born crawling or walking and likewise children are not born with normal vision.
- Children have to learn to see using their eyes constantly during the first few months and years of life. If this does not happen, the child's vision will not develop normally

- The sight and the eye of a child continue to develop as the child grows.

What are the major causes of childhood blindness & Visual Impairment?

- Vitamin A deficiency and measles
- Neonatal Conjunctivitis /red eye
- Cataract
- Refractive errors
- Glaucoma

Other Causes:

- ♦ Eye injuries
- ♦ Cerebral Visual Impairment
- ♦ Tumours or Cancer (Retinoblastoma)
- ♦ Squint
- ♦ Developmental anomalies of the eye

1. VITAMIN A DEFICIENCY

- Lack of Vitamin A in the body leads to xerophthalmia which means a "Dry eye"
- An early sign of vitamin A deficiency is dry appearance of conjunctiva described as Xerosis.
Vitamin A deficiency also causes poor night vision. The cornea may appear dull or dry and child may be poorly nourished
- Vitamin A deficiency occurs due to:
 - o Reduced intake of foods rich in Vitamin A
 - o Lack of absorption of Vitamin A usually because of diarrhoeal diseases and malnutrition.



Bitot's spot is white "foamy" spots on the white part of the eye



Undetected vitamin A deficiency may lead to corneal scars

Which Children are at risk of Developing Vitamin A Deficiency?

- Children aged 6 months to 6 years
- Malnourished and anaemic children
- Children who have measles infection
- Children who have diarrhoea/vomiting
- Children who have respiratory infections
- Dehydrated children
- Children who have malaria
- Children who have fever
- Children who are fed on foods which are poor in Vitamin A and proteins.

Measles & the eye

Measles lowers the levels of vitamin A because there is

- ♦ Increased needs for the vitamin by the body
- ♦ Reduced intake of food due to poor appetite

**1. What to do with children at risk of developing Vitamin A deficiency
i.e. (those with any of the listed risk factors)**

Give prophylactic Vitamin A capsule (as per dosage schedule) and repeat every 6 months.

Vitamin A Dosage Schedule

Age	Vitamin A Capsules (dose)		
	200,000 IU	100,000 IU	50,000 IU
Upto 6/12		½	1
Upto 1 year or <8kg	½	1	2
1 year – 6 years	1	2	4

**NB: DO NOT WAIT FOR VITAMIN A DEFICIENCY TO OCCUR
because you might lose the child and the eye**

WHAT ARE THE SIGNS OF VITAMIN A DEFICIENCY IN THE EYES

- Night blindness
- Xerosis: dry cornea and conjunctiva
- Bitot's spot: Foamy spots on the conjunctiva usually on the side towards the ear.
- Keratomalacia: melting of the cornea which may lead to cornea perforation.

2. How do you treat a child showing symptoms or signs of Vitamin A deficiency (night blindness, Bitot's spot etc) or a child who has measles?

- Give Vitamin A capsule immediately i.e. on diagnosis (day 1)
 - o Give second dosage following day (day 2)
 - o Third dosage is given in between week 1 and week 4
- Give topical antibiotic (Tetracycline eye ointment) – three times/day

- Refer the child immediately to an eye clinic.
- Nutritional support

3. How do we prevent Vitamin A deficiency in children?

- Supplement feeding of infants from 6 months with fruits such as papaya, mangoes. Other vitamin A rich foods that can be given daily to children are spinach, carrots, sweet potatoes, eggs, animal liver and fish liver oils.



Healthy diet for healthy eyes



MALEZI BORA; Afya leo ni uzima kesho

- Encourage mothers to breastfeed their children because breast milk contains Vitamin A.
- Prophylactic Vitamin A capsules given every 6 months to children aged 6 months to 6 years.
- Immunization against measles
- Avoid using harmful traditional practices which can damage the eyes
- If a child has an eye or visual problem seek medical advice
- Sick lactating mothers should get Vit A boost of 20000 i.u at 2 months post delivery

2. NEWBORN CONJUNCTIVITIS (Ophthalmia Neonatorum)

- Occurs in a child within the first 30 days of life.
- The great danger to sight is infection which might extend and involve the cornea.

Causes include:

- Bacteria, Chlamydia, Viruses
- Harmful traditional eye medicine

Infection with these organisms is not only confined to the eyes but can involve other body parts and therefore treatment requires systemic therapy and topical eye medication.



ophthalmia neonatorum

Who are the babies at risk of getting newborn conjunctivitis?

Babies born to mothers:

- With untreated sexually transmitted infections
- Who have premature rupture of membranes
- Who had prolonged labour

Mode of transmission:

- When baby's eyes come into contact with infected birth canal

- When baby's eyes come into contact with unsterile hands of birth attendants
- When baby's eyes come into contact with contaminated linen

How do we recognize newborn conjunctivitis?

- Occurs in babies less than 4 weeks old
- Can present from day 1 to day 30 after birth
- Pus from the eyes which can be:
 - o Purulent or
 - o Watery
- The eyelids may be swollen
- Red eyes (conjunctiva)
- Fever may or may not be present

How do we treat newborn conjunctivitis?

- Wash the pus from the eyes every 15 minutes with sterile saline or cool, boiled water
- Apply antibiotics eye ointments or eye drops hourly till pus decreases
- Give systemic antibiotics – for a total of 14 days
- Refer the baby and mother to an eye specialist/eye clinic immediately
- Refer both parents to health facility for examination and treatment where appropriate

How do we prevent babies from getting newborn conjunctivitis?

- Prophylactic treatment of a newborn child by cleaning of the eyelids and instilling eye antibiotic.

How is it done? - As soon as every child is born (preferably when the head is just delivered) or within 30 minutes after birth, the eyelids must be carefully cleaned with sterile moist cotton wool. A single application of tetracycline 1% eye ointment or **povidone iodine 2.5% eye drops** is made into each eye.

- Early identification and treatment of mothers in third trimester who have infection in their birth canal
- Antenatal screening of high risk women i.e. those who have vaginal warts, sexually transmitted infections
- Good management of labour (clean delivery)
- Prompt recognition, referral, and appropriate and rapid treatment of newborns with conjunctivitis.

3. RED EYE IN A CHILD

The white part of the eye is red with or without discharge.



Causes can be:

- corneal ulcer
- Infective conjunctivitis
- Trauma to the eye
- Iritis
- Allergic conjunctivitis

Signs/symptoms:

- The eye is red
- May have pain
- May have discharge
- May have tearing

What to do:

- Instill antibiotic eye drops/ointment
- Refer child to an Eye clinic

4. EYE INJURIES

Causes: - Burns from chemicals like acids, alkali which are found in household detergents

- Injury from blunt objects
- Penetrating eye injuries from sharp objects e.g. pens, stick
- Retained Foreign Bodies

On Examination

- The eyelid may be swollen in blunt injury or show visible lacerations.
- The eye is red and the cornea appears hazy in chemical burns
- In blunt and penetrating eye injury the cornea may be hazy, pupil distorted and anterior chamber may be shallow

What to do with eye injuries patients

In chemical burns irrigate the eye with clean water, apply tetracycline eye ointment and refer the patient to an eye unit immediately.

In blunt eye injury give painkillers and refer immediately

In penetrating eye injury

- Give T.T 0.5ml if child is older than 5 years
- Protect the eye with a clean pad or shield(avoid applying pressure on the eye)
- DO NOT INSTIL anything in the eye
- Refer immediately to an eye Clinic

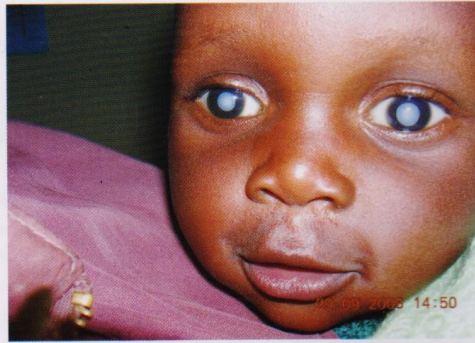
For lid laceration - Give T.T if child older than 5 years

- Refer to an Eye Clinic

Foreign body in the cornea or conjunctiva :- If loose remove it with cotton bud
: -If embedded refer to an Eye clinic

5. CATARACT IN CHILDREN

A cataract is an opacity of the lens of the eye. A child can be born with cataract or can develop it later.



Cataract both eyes

- Cataracts in children differ in two ways from those in adults:
 - o How and why they develop
 - o How they are treated

What causes congenital cataract?

There are a number of different causes of cataract presenting in newborn children:

- Can be genetic factors - inherited and therefore its good to enquire about family history of cataracts in parents and the other children.
- Infections affecting the mother during early months of pregnancy (first 5 months) – Rubella is a common cause.
- In most of the congenital cataracts the cause is unknown

Approach to care of a child with cataracts

- Examine the eyes if a cataract is present the pupil is **WHITE**
- If a cataract is present take an accurate history from the parents:
 - o If the mother was ill during pregnancy/any body rash/fever
 - o Any other children in the family with similar problems
- General examination of the baby
 - o Is the baby healthy - weight/feeding and development
 - o Does the baby have any other abnormality, e.g. small head, deafness, small eyes, growth and mental retardation
- Recognise and refer all children with a **white pupil** to an eye clinic or eye specialist. Remember there are other life threatening conditions that give a **white pupil** e.g. Retinoblastoma – eye cancer. Therefore refer the children as early as possible

Remember the parents will be distressed that their child is not perfect.

Explain gently the reasons for your enquiries and that you want to provide the best possible care for their child.

Health message to the parents/health workers

- Cataract can affect babies/children and is not a disease just of the elderly
- There is no medicine that can clear a cataract. The treatment is surgical.
- Early recognition, early treatment and early rehabilitation restore sight back to the visually handicapped child.
- Follow up throughout the child's life is very important

6. RETINOBLASTOMA

- Retinoblastoma is a cancer (growth) of the eye in children
- Without early treatment the growth causes death of the child
- The commonly affected children are below age of 5 years
- Reported as early as birth and as late as 7 years
- It can be inherited from parents or occur due to unknown cause
- It can present in one eye or both eyes.
- Other Siblings may have or have had the disease.

Signs/symptoms:

- A white pupil
- Squint - one eye not aligned with the other
- Loss of sight or reduced vision
- Glaucoma (discussed in the next page)
- Swollen eye with or without pain



Typical leukocoria in retinoblastoma (Early stage; Management: Surgery, to save life)



Advanced Retinoblastoma (Late Stage; Management: Palliative-Surgery, Chemotherapy and Radiotherapy) – This could have been prevented by early detection, referral and appropriate management.

What to do with the child :

- Early recognition and immediate referral to an eye centre
- Even if a mother complains that she sees a white pupil or a squint in her child's eye but when you examine the child you cannot find anything wrong, **please REFER that child soonest possible** to a specialized eye centre for further examinations. **DO NOT TELL THE MOTHER THAT THERE IS NO PROBLEM and DO NOT GIVE ANY MEDICINE.**

NB: Early recognition of the Retinoblastoma and appropriate treatment may prevent death of the child. There is no eye medicine that can cure Retinoblastoma.

Chemotherapy or Radiotherapy is done in late stages of the disease only for Palliative care.

7. CHILDHOOD GLAUCOMA

Glaucoma is a condition where pressure inside the eye is higher than normal. If untreated the raised pressure causes damage to the eye and permanent blindness:

- Can be present at birth or
- Can develop during the first few years of life
- The eyes are different to those of adults because they are elastic and can stretch.
- In childhood glaucoma, the eyeball stretches and enlarges as the pressure inside the eye increases. This is why glaucoma in a child is known as Buphthalmos or OX eye
- It usually presents in the first year of life and can affect one or both eyes.

Signs/symptoms

The infant has:

- Excessive tearing and watery eyes without discharge
- Photophobia - the child protects its eyes from the light
- Blepharospasms - squeezing of the eyelids
- Cornea is cloudy and larger than normal
- The infant may have red eyes without discharge



Cloudy corneas



Both eyes affected (extreme)

What to do with the child:

- Recognise the problem early
- Refer the child early to an eye clinic or eye specialist

Remember that the definitive treatment for childhood glaucoma is surgery.

8. REFRACTIVE ERRORS

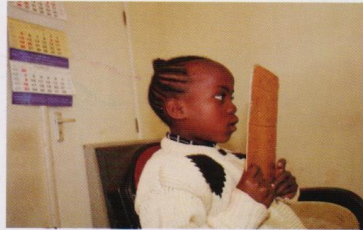
This is defective focusing mechanisms of the eye

How do these children present?

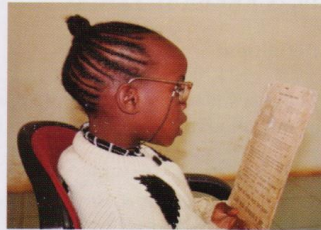
They bring reading material close to the face, may have headaches, watching TV at close range and tendency to move close to visual targets e.g. blackboard



A child corrected for refractive errors with spectacles



Myopic(Short Sighted) child reading at near without correction



Myopic Child reading with glasses on

What to do:

Refer the child to an eye clinic for evaluation and Management
They will need spectacles and are at risk of going blind if not corrected early

NB: They need the spectacles just the way they need clothes

9. SQUINTS

Means misaligned eyes



Squint

Any child presenting with misaligned eyes should be referred for further evaluation and management

Therefore:

- Recognise the problem early
- Refer early

10. CEREBRAL VISUAL IMPAIRMENT:

Definition:

This is a situation where a child presents with very poor sight but on detailed examination, the eyes are found to be normal

Common Causes include:

1. Prolonged labour & Birth asphyxia
 2. Childhood illnesses e.g. malaria, meningitis, measles, febrile illness
- The baby may have associated delayed or regressed milestones or have cerebral Palsy

Management: Frequent visual Stimulation, using a bright light source, use of brightly coloured materials and activities to use vision.

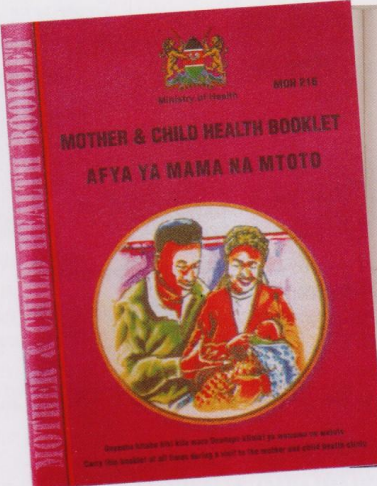
Prevention: Good management of labour
Early detection and good management of childhood illnesses

11. RETINOPATHY OF PREMATURITY (ROP)

- A disease of babies born prematurely , usually before 34 weeks of gestation and weighing less than 1700gm.
- It is associated with prolonged use of supplemental oxygen, in the newborn unit, due to the prematurity.
- They risk developing blindness in the first six months of life
- They need detailed Retina (eye) examination by an Ophthalmologist during the neonatal Period (the first month of life) .
- **NB: Preterm babies are at risk of going blind therefore they need eye examination within the first month of life.**

MOTHER AND CHILD HEALTH BOOKLET(MOH 216)

Children Eye check up is as important as giving a vaccine. Have you checked the baby's eyes before you administer the vaccine?



MOTHER & CHILD HEALTH BOOKLET
AFYA YA MAMA NA MTOTO

Reproductive Health and Family Welfare Department, Ministry of Health, Government of Kenya

REASONS FOR SPECIAL CARE (Tick as appropriate)

- Birth weight less than 2.5 kg ☐
- Birth less than 2 years after last birth ☐
- Fifth or more child ☐
- Teenage mother ☐
- Brothers or sisters undernourished ☐
- Multiple births (Twins, triplets) ☐
- Child in the family dead ☐
- Orphan ☐
- Child has disability ☐
- Parent HIV positive ☐
- History / signs of child abuse / neglect ☐
- Any other (Specify) ☐

IF YOU HAVE TICKED ANY OF THE ABOVE, COUNSEL THE CAREGIVER AND / OR REFER AS APPROPRIATE

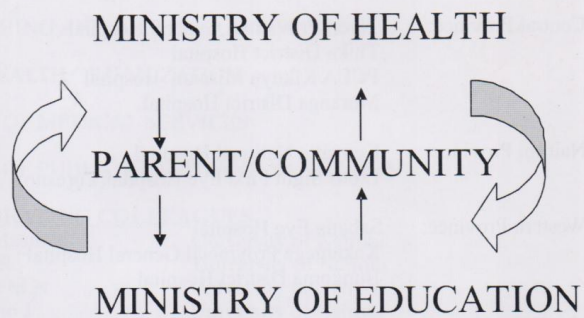
IDENTIFICATION OF EARLY EYE PROBLEMS IN AN INFANT

EYE CARE ASSESSMENT	AGE IN MONTHS		
	At Birth	At 6 Months	At 9 months
TETRACYCLINE EYE OINTMENT (TWO DROPS)			
BLIND			
White (if white reflex)			
Following Objects			
Not following objects (Refer to eye clinic)			
Strabismic (Refer to eye clinic)			
ANY OTHER PROBLEMS			

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12. REHABILITATION

- After all examinations, all available treatments are given and the child's vision is still poor, the child needs skill rehabilitation and Education.
- Parents have a major role to play in form of visual stimulation , using
 - o Light source
 - o Coloured material
 - o Activities to use vision
- Irreversibly blind children require training in mobility
- Education: specialised education programs available with Ministry of Education (District Education Assessment and resource Centres)



ANNEXE 1 HOSPITALS

REFFERAL HOSPITALS WITH EYE CLINIC AND EYE DOCTORS

- 1)Nyanza Province: Kisii(level 5),Homa Bay and Migori District Hospitals
Kisumu Provincial General Hospital, and Siaya
District Hospital
- 2)Rift Valley Province: Nakuru Provincial General Hospital
Kitale District Hospital
Moi Teaching & Referral Hospital
Tenewek Mission Hospital
AIC Litein Mission Hospital
Kericho District Hospital
Narok District Hospital
- 3)Central Province: Nyeri Provicnial General Hospital
Thika District Hospital
PCEA Kikuyu Mission Hospital
Muranga District Hospital
- 4)Nairobi Province: Kenyatta National Hospital
Lions Sight First Eye Hospital(Loresho)
- 5)Western Province: Sabatia Eye Hospital
Kakamega Provincial General Hospital
Bungoma District Hospital
- 6)North Eastern: Garissa Provincial General Hospital
- 7)Eastern Province: Embu Provincial General Hospital
Machakos District Hospital
Meru District Hospital
Maua Methodist Hospital
Kitui District Hospital
- 8)Coast Province Coast Provincial General Hospital
Lighthouse for Christ eye centre
Kwale District Eye Centre
Malindi District Hospital

COLLABORATING INSTITUTIONS AND PARTNERS

UNIVERSITY OF NAIROBI; DEPARTMENT OF OPHTHALMOLOGY

KIKUYU EYE UNIT

SABATIA EYE UNIT

LIGHT HOUSE FOR CHRIST EYE CENTRE

INTERNATIONAL CENTRE FOR EYE HEALTH; LONDON

LIONS SIGHT FIRST EYE HOSPITAL AND THE LIONS CLUB
INTERNATIONAL FOUNDATION

KENYATTA NATIONAL HOSPITAL AND ALL GOVERNMENT HOSPITALS

MOI TEACHING AND REFFERAL HOSPITAL

WORLD HEALTH ORGANIZATION

MINISTRY OF MEDICAL SERVICES

MINISTRY OF PUBLIC HEALTH AND SANITATION

COLLABORATING COLLEAGUES

Prof. M.S. Masinde	University of Nairobi
Dr. Ilako D.R	University of Nairobi
Dr. Njuguna M.N	University of Nairobi
Dr. Karimurio J	University of Nairobi
Mr Bob Anzere	Samburu District Health office
Ms Dorcas Chelang'a	Division of Ophthalmic Services
Ms Farida Tomno	Department of Health Promotion
Dr. Helen Nzuki	Machakos General Hospital
Mr. Ronnie Mulatia	Thika District Hospital
Dr. Dan Gradin	Kikuyuu Eye Unit
Dr. F.N.Kagondi	Thika District Hospital
Mr Jonathan Buturu	Uasin Gishu District Hospital
Dr. Matende I	Light House for Christ Eye Centre
Dr. Njambi Lucy	Embu Provincial General Hospital
Dr. Mutie Dorothy	Nyanza Provincial General Hospital.
Dr. Wanjala Isaac	Moi Teaching and Referral Hospital
Dr M.M. Kariuki-Wanyoike	University of Nairobi



**World Health
Organization**

**Prevention and control of childhood blindness
is everyone's concern. Let's all work together
to make this a reality.**

Division of Preventive Ophthalmic Services
Department of Disease Prevention and Control

P.O.Box 43319 00100
Nairobi- Kenya
Email : dpos@health.go.ke
dcos@health.go.ke
Web Site: www.health.go.ke