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The Importance of Primary Eye Care

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Primary eye care (PEC) is a broad concept, encompassing the prevention of potentially blinding eye diseases through primary health care (PHC). PEC includes the identification, with treatment or referral, ofindividualswithtreatablecauses of blindness; and the diagnosis and treatment of common eye diseases, particularly those causing an acute red eye (see Figure on page 19). The principles of PHC (i.e., fair distribution;community involvement; focus on prevention; appropriate technology; multi-sectorial approach) should all apply in primary eye care. If many of the eight essential elements of PHC are applied, this would contribute significantly to the prevention of eye diseases and blindness.

The eight essential elements of PHC are as follows:

1. Education concerning main health problems
2. Promotion of food supply and good nutrition
3. Adequate supply of safe water and basic sanitation
4. Maternal and child health, and family planning
5. Immunisation against major infectious diseases
6. Prevention and control of local endemic diseases
7. Appropriate treatment of common diseases and injuries
8. Provision of essential drugs.

Preventable causes of blindness: Currently there are estimated to be approximately 140 million children with active trachoma which could be prevented if water supplies and sanitation were improved, as has occurred in Europe where trachoma used to be endemic. Intersectorial collaboration between health workers, water engineers and environmental officers is essential for the control of trachoma. As trachoma principally affects poor, disadvantaged communities the principle of even distribution of resources is also highly relevant. Community participation needs to be encouraged for the control of trachoma

It has been estimated that 500,000 children become blind every year, the majority from corneal scarring due to vitamin A deficiency, measles and the use of harmful traditional eye medicines. Much of this blindness could be prevented if the underlying causes could be addressed through PHC, i.e., safe water supplies to prevent diarrhoea, immunisation to prevent measles infection, promotion of food supplies and good nutrition, the availability of essential drugs to reduce dependence on harmful traditional remedies, and maternal and child health. These activities should all be included in primary eye care.

In Sub-Saharan Africa there are estimated to be 18 million people infected with *Onchocerca volvulus* who are at risk of blindness from sclerosing keratitis, optic atrophy and chorioretinitis. Programmes which distribute ivermectin to affected communities for the control of onchocerciasis are also primary eye care activities. The aim of ivermectin distribution is to prevent eye disease and blindness in those already infected, as well as to reduce transmission, so preventing infection in uninfected individuals. Programmes, in which the community has selected those who will distribute ivermectin, have been

Primary eye care: waiting to see the trained community health worker at Wad Sharifi refugee camp, eastern Sudan

Photo: Murray McGavin

In This Issue . . .

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more effective than those where ivermectin is distributed by people chosen by external bodies, showing the importance of community participation, another principle of PHC.

Treatable causes of blindness: There are many eye diseases which, if detected early, can be treated to prevent blindness (e.g., trichiasis from trachoma, early diabetic retinopathy). There are other conditions, such as cataract, where sight can be restored by appropriate surgery.

It is estimated that 10 million people (mainly women) are at risk of blindness fromtrachomatous trichiasis. These people need to be identified and surgery performed in the community, to prevent them from becoming blind. Surgery performed in a clinic setting is unlikely to meet the need, as people affected by trichiasis usuallycomefromremote,poor rural areas.

In Western countries diabetic retinopathy is an important cause of potentially preventable blindness in people of working age. Screening programmes, undertaken by appropriately trained personnel, exist is many communities to diagnose and refer those needing photocoagulation to prevent blindness. Primary open angle glaucoma affects an estimated 13.5 million people worldwide; these individuals need to be identified and referred for treatment to prevent blindness. Primary eye care is, therefore, essential in all communities, and in all regions of the world.

Of the estimated 38 million who are blind, 20 million are blind from cataract, a condition where sight can be restored by surgery. Individuals requiring cataract surgery need to be identified and referred, an activity which also comes within the remit of primary eye care.

Eye diseases requiring treatment: In many countries eye diseases (such as conjunctivitis, mild trauma, watery eyes, etc.) are among the commonest health problems presenting to primary level health workers. These health workers need to know how to examine the eyes, how to diagnose conditions they can adequately treat themselves, and which eye diseases they should refer for more detailed examination, diagnosis and treatment. This is a very important activity of primary eye care, as the wrong diagnosis can lead to delay in providing the right treatment, which may have adverse long term consequences. Primary level workers should know how to diagnose and treat infections such as conjunctivitis; they should know when to begin treatment and refer (e.g., for corneal ulcers); and they should know which conditions should be referred to the secondary or tertiary level (e.g., loss of vision, cataract).

Summary: Primary eye care, therefore, includes many activities which can be implemented in the community, or at the primary level of health care. Primary eye care is the essential building block for prevention of blindness in all communities and in all regions of the world. Without primary eye care only those individuals who present to secondary and tertiary facilities will be diagnosed and treated, and little will be achieved in terms of prevention. Different cadres of worker can be involved, many of whom already have many duties and responsibilities. This is one of the dilemmas and challenges facing the effective and integrated implementation of primary health care. Consideration also needs to be given to the training requirements of these cadres so that they become integrated primary eye care workers. Primary eye care cannot function effectively in isolation. It is very important that there is good communication as well as effective referral systems to the secondary and tertiary levels of eye care where there are facilities and personnel trained more specifically in the treatment of ocular diseases.

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Community Eye Health

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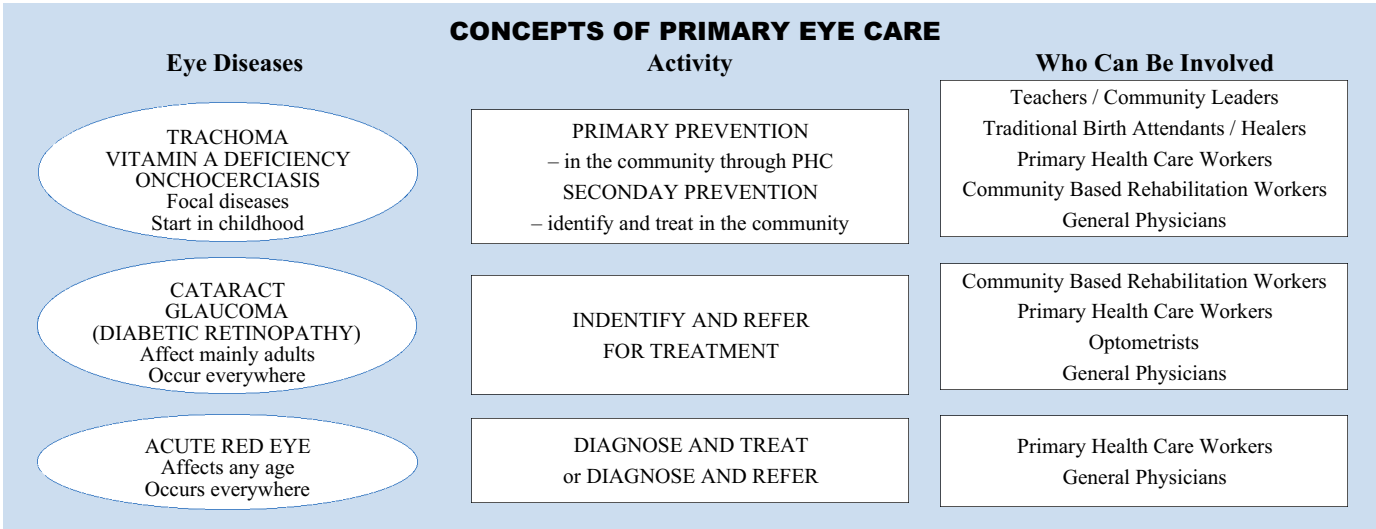

Essential Components of Primary Eye Care

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Introduction

Primary eye care activities cover the following two areas of community health services.[1]

1. Clinical service component
2. Eye health protection and promotion component

It is most important that most activities are initiated and sustained by community members themselves. The eye sector helps the community, complementing what they do in their day-by-day activities.

The essential elements of primary eye care should be determined by careful study providing a 'community diagnosis', based on an epidemiological approach. The study will list community eye problems in order of priority. To this end the study should be planned to include the following information:

1. **Magnitude: M** – prevalence and incidence, given by the number of community members suffering from particular conditions and new cases expected in a given period of time.
2. **Implication: I** – social and economic consequences from the condition, given in terms of expenditures, work loss, absence from school, etc.
3. **Vulnerability: V** – availability of effective means of intervention.
4. **Cost: C** – resources needed for control programmes.

Priority may be known from:[2]

$$\text{Priority} = (\mathbf{M} \times \mathbf{I} \times \mathbf{V}) / \mathbf{C}$$

This is a simple model illustrating scientific application in planning. It should avoid instinctive preferences based only on clinical experiences.

Service Components of Primary Eye Care

Service in the community should be sufficiently comprehensive to cover aspects of primary, secondary and tertiary prevention targeted for all community members whether they have or do not have eye problems. This is the point where community-based care differs from hospital-based services.

It begins with an understanding of any community at a point in time, and recognises three groups of people in need of eye care screening:

1. Healthy group.
2. The group with certain eye diseases or problems.
3. The group at risk of eye diseases or problems.

Hence, services should not only be clinical, but equal or more attention is needed for people without disease. Primary eye care, therefore, covers the whole range of eye health care for all community members.

Clinical Service Component

Community diagnosis precedes primary eye care activities and may give a different outlook regarding eye health of individual communities. This leads to adapted service components, according to social and economic standards, as well as the available system of health care. Essential elements, therefore, vary accordingly and may not include only the well known major blinding conditions. In addition, common eye disorders found in individual communities require simple but adequate services

WHO GUIDELINES FOR PRIMARY EYE CARE

1 Conditions to be recognised and treated by a trained primary health care worker
- Conjunctivitis and lid infections
  - Acute conjunctivitis
  - Ophthalmia neonatorum
  - Trachoma
  - Allergic and irritative conjunctivitis
  - Lid lesions, e.g., stye and chalazion
- Trauma
  - Subconjunctival haemorrhages
  - Superficial foreign body
  - Blunt trauma
- Blinding malnutrition

2 Conditions to be recognised and referred after treatment has been initiated
- Corneal ulcers
- Lacerating or perforating injuries of the eyeball
- Lid lacerations
- Entropion/trichiasis
- Burns: chemical, thermal

3 Conditions that should be recognised and referred for treatment
- Painful red eye with visual loss
- Cataract
- Pterygium
- Visual loss; <6/18 in either eye

particular to that community. Decisions, therefore, should be made, not according to clinical interest, but from a public health point ofview. Conditions which are simple to prevent and manage and common to many communities are included in primary eye care services. This is true, for example, for reading problems among the elderly, and seasonal conjunctivitis may well need equal attention. In general, the World Health Organization provides the guidelines given on page 19.[3]

Based on the WHO guidelines and available data, the model initiated in Thailand, which started primary eye care in 1981, integrated the following conditions into primary health care:

- Cataract (age-related/'senile' type)
- Trachoma and its late complications

Discussion on the common eye diseases for community volunteers: mostly teachers, traditional healers and senior students. An ICEH slide set is being used. Vivekananda Mission Asram, West Bengal, India

Photo: Anup, New Stylo, Chaitanyapur

Table 1: Primary Eye Care Integration Matrix

PHC PEC	Health education	Family planning & MCH	Food & nutrition	Safe water & basic sanitation	Extended programme of immunisation (**)	Essential drugs	Control of local endemic diseases (****)	Care for mild ailments ('simple' treatment)
Cataract **Surgical** **Non-surgical**	+++ ++	+ for congenital cataract	NA	NA	NA	++ post operation care	+++ case finding, referral & community care	+++ case finding, referral & community care
Trachoma **Active** **Complications**	+++ ++	+++		+++ ++	NA	+++ tetracycline ointment	trachoma programme +++ +++	trachoma programme +++ +++
Glaucoma **Acute attack** **Angle-closed(*)**	 ++ ++	+ for congenital glaucoma	NA	NA	NA	++ pilocarpine eye drops		++ pilocarpine eye drops
Eye injuries	++	+++ accident prevention		++ improve environment	NA	+++ tetracycline ointment		+++ tetracycline ointment
Corneal ulcer	+++	+++ accident prevention	NA	NA	measles immunisation	+++ tetracycline ointment		+++ tetracycline ointment
Eye infections **EKC** **Chronic**	++ ++	+++ ++	NA	++ ++	NA	+++ ++	disaster management sometimes	+++ tetracycline ointment
Ophthalmia neonatorum	+++	+++	NA			+++		+++ immediate referral
Pterygium **Surgical** **Non-surgical**	 ++ +	NA	NA	 ++ ++	NA	NA		 ++ referral
Refractive error & Reading difficulties	++	++ family screening	NA	NA	NA	+ providing simple spectacles		+ providing simple spectacles
VA less than 0.05 (<3/60)(***)	++	++ family screening	NA	NA	NA	NA		++ referral

(*) In many instances, angle-closure glaucoma refers to the acute attack, with one eye already blind and prophylaxis required for the second eye. Secondary glaucoma is common among neglected age-related cataract patients.
(**) EPI staff are good health communicators, educators and gather community information.
(***) Diabetic retinopathy is common in some communities. This is the category 4 in the WHO categories of visual impairment.
(****) The cataract backlog might be regarded as an endemic disease in the given region, like tuberculosis, malaria and leprosy, etc. Trachoma, and its control is also relevant here. When the conditions are well controlled, they become part of a successful integrated health programme in that locality.

Table 2: Cataract Programme at Community Level

Level	Individual	Family	Community	1st level of contact (Health Centre)	1st level of referral (District Hospital)
Action	Aware of own vision. Slowly progressing, painless visual impairment, either one or both eyes. Respond to health workers after screening. Prompt report to eye team for operation.	Help bringing the cataract patient to eye unit. Encourage operation and prepare hospitalisation. Adequate post-operative care and suitable home and out-door activites.	Co-operate with health workers and visiting eye personnel in surgical care. Surgical subsidies for the poor.	Co-operate with visiting eye team in community activities. Co-ordinate community in the cataract programmes.	Co-operate with visiting eye team and preparation of service sites. Post-operative follow-up. Proper care for complicated cases.
Input	Health education, posters, booklets, etc.	Health education, posters, booklets, etc.	Primary eye care course. Primary eye care kits, manual and guidelines, records and reporting systems.	Primary eye care course, minimum supplies and equipment, records and reporting systems.	Short, clinical training, minimum required supplies and equipment. Monitoring/supervision.

- Eye injuries
- Corneal ulcer
- Glaucoma, acute attack and cases with one blind eye
- Ophthalmia neonatorum
- Eye infections
- Pterygium*
- Refractive errors and reading difficulties
- Conditions with visual acuity less than 0.05(<3/60)**

(* Highly prevalent in Thailand)
(** Implies possible cases with disorders of the posterior segment of the eye, which may need referral).

Almost similar conditions were identified in Myanmar, then Burma, which also began primary eye care in 1981. Hence, all the above are essential elements in the clinical services of primary eye care in this part of the world. The same is also true for primary eye care in Vietnam, Laos and Cambodia, and even in China.

Other regions of the world have their own particular needs. For example, where onchocerciasis is highly prevalent, special action is needed in the primary eye care context.

Integration Matrix

Primary eye care should not be planned separately from primary health care. That is, primary eye care is regarded as an entry point, with primary health care, which goes to the heart of community. It is important to understand that primary health care is the mother system into which primary eye care, or basic eye care, is integrated. Careful situational analysis is, therefore, absolutely necessary for effective primary health care in the targeted community, with special attention to its essential elements.

Cultural evening on health care in India

Photo: Anup, New Stylo, Chaitanyapur

The matrix given in Table 1 shows how integration can proceed on the premise that health care is established.

Cataract Programmes and Primary Eye Care

A cataract programme can be a good example of primary eye care working effectively within the framework of primary health care. The success of these programmes, within primary eye care, has been seen in many countries.[4] Activities largely rely on community involvement, as in case finding and mass referral. The surgical eye team can play its role cost effectively, provided the community preparations are completed well in advance of actual surgery.

The activities start with a short training course for community health workers in the recognition of cataract, followed by door-to-door visits. Multi-stage screening is part of primary eye care in case finding, and encouraging patients to present for surgery. At the same time, information on eye care should be made available throughout the community by all known means. Possible community activities are summarised in Table 2.

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Who Can Carry Out Primary Eye Care?

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Introduction

Primary eye care is a vital component in primary health care and includes the promotion of eye health care, the prevention and treatment of conditions that may lead to visual loss, as well as the rehabilitation of those who are already blind. The aim of primary eye care is to change the pattern of eye care services, currently often limited to the central hospitals and eye units in the cities, to countrywide blindness prevention programmes.

Primary eye care is the primary health care approach to the prevention of blindness and it should be an integral part of primary health care. Primary health care is defined as essential health care based on methods and technology that are practical and scientifically sound, as well as socially acceptable; accessible to the community, affordable for the community with good community participation.[1]

In most developing countries avoidable blindness constitutes a major public health problem. There are distinct, closely related components in the primary health care approach to blindness prevention. Only one of the components requires interaction between the sick individual and medical personnel.

In many developing countries there are insufficient trained staff, and eye care services have to be given to widely and often sparsely scattered populations.[2] An ophthalmologist in such a setting becomes overwhelmed with the demands that require his or her attention. Reviewing activities at the end of the year reveals that very few of the diseases that cause over 70% of blindness have been significantly addressed.[3] Most of the blindness we encounter is avoidable. Cataract is responsible for nearly 50% of blindness throughout the world.[4] In fact most of the cases that occupy the ophthalmologist's time can be delegated to others if they are adequately trained and equipped. We began an exercise to prepare suitable personnel. Our aims were as follows:

- Train at least one **integrated eye worker** and staff in every health care institution.
- Staff an **ophthalmic clinical officer** or an **ophthalmic nurse** at each General/ District Hospital.
- Teach each **traditional birth attendant (TBA)**, **community health worker (CHW)**, **community based rehabilitation worker (CBRW)** to understand how to prevent blindness.

We are now interacting with the **traditional healers** to collaborate with them in the prevention of blindness. We also support these groups of eye workers through:

- Regular visits to their centres
- Taking referrals
- Supplying essential eye medications
- General supplies
- Continuing education.

As a result of this exercise we were able to increase our cataract surgical rate threefold.

Categories of Eye Care Workers

Eye care staff can be grouped into three main categories:[2]

1. **Full time eye care workers.**
   - **Ophthalmologists**
   - **Ophthalmic clinical officers**
   - **Ophthalmic nurses**
   - **Optical technicians**

2. **Integrated eye care workers.** All health workers of any type must be involved in integrated eye care services and eye care as part of their day-to-day routine.

   - **General practitioners**
   - **Clinical officers**
   - **Nurses**
   - **Midwives**
   - **Environmental health technicians**

3. **Community eye care workers**. These are people who, in the course of their normal work, have close contact with the community, especially at village level, including CHWs, TBAs, CBR volunteers and traditional healers. These colleagues, by use of appropriate knowledge, can be instrumental in the prevention of blindness. Other non-medical personnel whose contribution and participation can enhance the blindness prevention activities include:

Mr Bashir El-Tayeb Mohd., senior ophthalmic medical assistant, with teaching materials used in training community health workers. Kassala State, Sudan

Photo: Murray McGavin

   - **School teachers**
   - **Church/religious leaders**
   - **Agriculture extension officers**
   - **Water department officers**
   - **Headmen**
   - **Social welfare officers**

Job Description

Primary eye care activities are as follows:

1. **Creating awareness (promotive)**. This is the strengthening of community awareness and co-operation to promote health within the family unit. Appropriate information is disseminated to as many people in the community as possible. Current traditional health education methods carried out in clinics and health centres are not appropriate, hence the impact of such methods are negligible. People from within the community are very effective in creating awareness. In using the appreciative inquiry method we ask the question, "In this community what are the existing communication lines that we can use?". The answer is, there are several. These include:

- The **ophthalmologist** who passes the information on to the trained health personnel.
- **Trained health personnel** who use this information to train others, for example:
   - **Community health workers:** These include community health workers or primary health workers; traditional birth attendants (TBA); community baseddistributors(CBD); and, recently, community based rehabilitation workers (CBRW). These are people chosen by their respective communities to look into the affairs of the

Equipment given to community health workers after training. Kassala State, Sudan

Photo: Murray McGavin

community's health. They know how to present the information given to them in a language the community will understand and accept.

- **Community leaders:** These include village headmen, church leaders and other influential people in the community.
- **Administrative authorities:** These are local government officials and departmental managers.
- **School teachers:** Professionals who will make eye health part of the school curriculum and thus create a new generation of citizens who know about blindness and its prevention.
- **Traditional healers:** These are health care providers who are accessible in their communities. Given the correct information, these people will provide a potential cadre of primary eye care workers.

The information given to pass on includes:

- The burden blindness brings to individuals who are themselves blind, and on the family at home and on the community as a whole.
- The major blinding diseases which are common in the area and how blindness can be avoided.
- Understanding of basic first aid skills in case of accidents and treatment of the common eye diseases.
- Offering guidance to the community on how to arrange transportation and reach the health centre where more help can be given.

2. **Prevention**: This includes stimulation of individuals and their community to participate in activities in blindness prevention; social and community development that promotes health through changes in behaviour and environment and leads to the reduction or elimination of factors contributing to ocular disease. Examples of activities are as follows:
   - Provision of adequate, safe water supplies; personal hygiene.
   - Construction, use and maintenance of pit latrines and refuse pits; environmental hygiene.
   - Growing and consumption of foods rich in vitamin A; nutrition.
   - Recognition and appropriate care of individuals at risk of blinding diseases; for example, adequate feeding and rehydration of children with severe measles, malnutrition or diarrhoea.
   - Protection of eyes against injuries.
   - Immunisation against measles.
   - Screening of antenatal mothers for sexually transmitted diseases.

Most of these can be done by the **environmental health technician** or **health inspector, community health nurses, community health volunteers, school teachers, agricultural extension officers, nutritionists, road traffic inspectors**, and other **community members**. Satisfied former cataract patients will respond to a request to direct others to the clinics for appropriate treatment. The key roles of the **trained eye health personnel** involves training and support.

3. **Curative activities**: This involves delivery of eye care to all individuals with potentially blinding disorders in the communities. For example:
   - First aid treatment and/or timely referral of patients with injuries.
   - Identification and treatment/referral of common eye diseases.
   - Identification and referral of patients with potentially blinding diseases for appropriate management.
   - Identification and referral of curable blinding diseases like cataracts.

These activities are mostly carried out by **community health volunteers** who refer to the **trained health personnel** who eventually hand the patients over to the **trained eye workers.**

4. **Rehabilitation activities:** What happens to those who are incurably blind? Do we merely sympathise with them and their families? Since primary eye care is mainly concerned with the community level, the issue of rehabilitation becomes very important. Clients are assured that they are *not* completely

Table 1 : Primary Eye Care Activities

Activity	What?	Where?	Who?
Awareness creation	Teaching about blindness, its effects and its causes	Community, Schools, Health Centres, Hospitals	Community health workers, Traditional healers, School teachers, Pupils, Trained health workers, Community leaders, Media
Preventive activities	Immunisation Water and Sanitation Nutrition Prevention of injuries Antenatal screening Eye prophylaxis for the new born	Community, Health Centres, Hospitals	Community health workers, Traditional healers, Parents, Environmental health technicians, Public health nurses, Midwives, Clinical officers, Medical officers
Clinical	First Aid management of injuries Recognition and management of common eye diseases Recognition and management/referral of potential blinding diseases Recognition and management referral of curable eye diseases – e.g., cataract	Community, Health Centres, Hospitals	Community health workers, Traditional healers, Nurses, Clinical officers, Midwives, Medical officers, Ophthalmic nurses and Ophthalmic clinical officers
Rehabilitation	Identification of the incurably blind directing them to an appropriate rehabilitation programme	Community, Health Centres, Hospitals	Parents, Teachers, Community health workers, Trained medical personnel, Community based rehabilitation workers, Social workers, Community leaders

useless. With training, skills can be acquired and they can be functional and not have to rely totally on others. Here the CBR volunteers, as well as all the other volunteer workers, are very important. All trained health personnel, school teachers, social workers can connect these incurably blind to rehabilitation programmes that exist in the area (Table 1).

Conclusion

To have a successful primary eye care programme, there needs to be coordinated teamwork. There should be regular interaction between the full time eye workers, the integrated eye workers and the volunteer eye workers. The complementary nature of the team needs to be understood and appreciated.[5] Task oriented training of all team members should be based on the skills that they need to acquire and in which competence is necessary.

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Development of Primary Eye Care as an Integrated Part of Comprehensive Health Care

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Introduction

1. **Comprehensive health care** includes the activities of health promotion, disease prevention, curative measures at the time of illness, and rehabilitation if the damage caused by the disease is disabling. This type of health care may be made available, accessible, affordable to the poorest rural population and should be sustainable.

2. The concept of **primary health care (PHC)** was introduced in 1978 in Alma-Ata. It was envisaged as a solution to reach the unreached in poor rural populations of many developing countries. It was said that it would be made universally accessible to individuals and families in the community through their full participation.

Primary eye care (PEC) is the most basic eye care available to individuals and families wherever they live and whatever their socio-economic condition. The PEC worker will be able to manage some cases, diagnose other conditions, explain the possible interventions, with advantages and disadvantages, help the patient in decision making, encouraging active involvement of the individual and the family.

3. **Primary eye care is a vital component of primary health care** and includes the promotion of eye health and the prevention and treatment of conditions that may lead to visual loss.[1]

The essential components of primary eye care are:

1. Promotive
2. Preventive
3. Curative
4. Rehabilitative

Such care can be provided by:

- GP's
- General duty doctors at basic health units and rural health centres
- Paramedics
- Community based rehabilitation workers
- Other interested personnel

In developing a primary eye care programme emphasis should be placed on training of the above groups of workers in providing basic eye care to individuals or communities.[2]

The job description of these health care workers will be different according to the medical practices of that country. Written teaching material and methods of teaching will differ accordingly. The trainer in primary eye care has to keep in mind the educational background and experience of the trainees. The rationale desired for the training is not to make it too basic for doctors with MD/MBBS so that it becomes boring for them. At the same time it should not be too technical and sophisticated so that paramedics, particularly the community health worker, lose interest and the training course is considered very difficult and, therefore, less attractive for future potential candidates.

Most of the major causes of blindness in developing countries are either preventable, e.g., trachoma, vitamin A deficiency, etc., or curable, such as cataract.

Primary eye care activities can be integrated into primary health care as shown in Table 1.

Development of primary eye care in a region/country will mainly depend upon the existing health care services and the different categories of available health care workers. The success of primary eye care programmes will first address the following questions:

1 How good is the training of the primary health care worker?

Table 1: Primary Eye Care is Related to the Elements of Primary Health Care

(Safe) water	Prevention of trachoma and vitamin A deficiency; prevention of diarrhoea which may reduce cataract prevalence
Basic sanitation	Prevention of trachoma and vitamin A deficiency
Maternal/child care; family planning	Prevention of vitamin A deficiency, measles, trachoma and ophthalmia neonatorum
Immunisation	Prevention of childhood blindness from measles and congenital rubella
Control of locally endemic diseases	Trachoma control
Health and nutrition education	Trachoma, vitamin A deficiency, trauma
Treatment for common diseases	Corneal ulcers, refractive errors, trauma
Provision of essential drugs	Tetracycline eye ointment and vitamin A capsules

Refugee children collecting milk in the North West Frontier Province, Pakistan. The milk was made from powdered milk which contained vitamin A

Photo: Murray McGavin

2 What is the accessibility of the PHC system to the people in need?
3 What proportion of the population is utilising the available PHC services?
4 What is the implementation stage of inter-sectoral collaboration, e.g., supply of clean water and sanitation, availability of nutritious food at affordable costs and the availability of secondary health/eye care to look after referred cases?

Requirements of primary eye care: The development of primary eye care will require;

1 Political and professional will.
2 Manpower (master trainers, trainers and identification of trainees).
3 Management and material to conduct training and supervise and monitor the impact in communities.
4 Material (for teaching of PEC workers and distribution in communities and for maintaining the management information system).
5 Supplies for PEC workers.
6 Budgets; funding for capital and recurrent costs (training, supervision, salaries).

For the primary eye care programme to be effective it must have close liaison with secondary and tertiary levels of health care and a proper and adequate back up referral system.

Each primary eye care worker should be an effective educator and have good communication skills, and increase awareness of eye health by talking to village leaders, community administrative authorities, school teachers, pupils and individual households.

Each eye care worker should have medicines and basic equipment such as:

Medicines:

Tetracycline 1% eye ointment
Chloramphenicol 0.5% eye drops
Zinc sulphate 0.2% eye drops
Vitamin A capsules
Silver nitrate 1% eye drops

Basic equipment:

Snellen E chart
Hand magnifying lens
Torch and batteries
Epilation forceps (in trachoma endemic areas)
Dressings: eye pads, bandages, sticking plaster, eye shields.

A primary eye care worker should be able to treat certain conditions, treat and refer particular eye problems or refer patients directly for appropriate secondary or tertiary specialist care. (Please see WHO guidelines for primary eye care in K Konyama's article in this Issue).

Problems Encountered

The concept of primary eye care is very good but, in many countries, the concept remained in the Ministries of Health. The medical staff who were supposed to implement it in the field were neither involved in decision making nor in planning the implementation strategy and monitoring. As a result, the medical staff in the field did not 'own' the programme and were involved mainly in therapeutic medicine. Working conditions also were not good because staff were not mobile — whatever little transport was available did not work because of lack of fuel and maintenance funds.

The concept of PHC and its teaching was not introduced into the basic training curriculum of doctors (and paramedics). When these doctors were posted to rural health facilities, they were unaware of the elements of PHC and were lost as to what to do in these circumstances. As a result, they took the easy option of staying in the health facility, waiting for patients to come to them for curative medicine. The low and uneven flow of patients resulted in a feeling of loneliness and frustration for the doctor. This affected his/her attendance and punctuality in the health facility, with a consequent further reduction in the number of patients. The people coming to health facilities expected medicine for every possible disease, because politicians used to tell them that the government would provide free treatment. The number attending health facilities started fluctuating along with the supply of medicines (anti-diarrhoeal, antibiotics, tonics, cough syrups and steroid/antibiotic eye drops, etc.).

As a result, PHC programmes in many countries did not achieve the objectives for which they were initiated.

Sustainability of a Programme

For any programme, the question of sustainability is an important issue. Sustainability can be divided into three areas:

I Technical
II Financial
III Operational

I Technical sustainability: Teaching materials (e.g., colour slides of different eye diseases/text accompanying the slide set) need to be developed for different regions using African, Asian and Chinese faces so that these eyes/faces are familiar to the trainees in these regions. These slides sets can be organised in the following manner.

1. The most common eye conditions presenting to the health care worker while working in a community.
2. Presentation of visual symptoms, e.g., sudden loss of vision (showing different conditions), gradual loss of vision (with different clinical eye conditions), colour changes or changes in the size of the eye in different eye diseases, and their management.
3. Different common eye diseases in different age groups :
   (a) neo-natal
   (b) childhood
   (c) adolescent/adult life
   (d) eye problems of middle and old age

The text accompanying the slides will vary for different groups of trainees according to their previous knowledge of eye conditions.

Training in PEC will need master trainers who can train regional/country/provincial staff involved in teaching the basic curriculum for different medical, nursing and paramedical courses in the

country/province. Teaching of PEC can be made part of the curricula for different continuing medical education courses in the country. The inclusion of PEC may involve revision of the basic curricula taught in different medical/ paramedical institutions.

The courses in PEC can be run for different periods of time depending on whether it is in-service training or part of a basic curriculum. The one found useful in the North West Frontier Province of Pakistan is a course of one week initially and then 2–3 day refresher courses every 6-12 months. The refresher course will have a problem solving approach when participants will come with descriptions of cases they have seen in communities and discuss them with their course facilitators.

II Financial sustainability: Any government/organisation is particularly interested in the sustainability of a programme when outside financial support is withdrawn. Therefore, it is more appropriate to train staff providing primary health care who are on the regular budget of government or other organisations which decreases the recurrent cost. The role of different health workers in the private sector in the provision of primary eye care needs to be examined critically. Presently, the training of these workers is not accepted by many governments and NGDOs. But these health workers are in place and are providing health care to a substantial proportion of the population in urban slums and difficult rural areas. Because of their good public relations and appropriate communications skills, they are accepted in the communities at an affordable cost. They can be made 'safe' and effective health workers by reinforcing their technical skills.

Capital investment will be needed to train master trainers (community ophthalmologists) and for the provision of audio-visual and other teaching materials. Community ophthalmologists will become a new, desirable cadre involved in planning, implementing, monitoring and evaluating primary eye care activity as part of comprehensive eye care, which in turn will be an integral part of comprehensive health care.

III Operational sustainability: About 15–20% of patients seen/detected by the primary eye care worker will need medical/optical/surgical interventions in a secondary eye care centre (cataract, refractive errors in children, squints, trauma, corneal ulcers). For the acceptability of any primary eye care it is very important to develop appropriate secondary eye care services to deal with referred cases from the primary level. Without these support services the development of primary eye care may increase the agony of patients and their families, because they have been ignorant of the disease and now do not have access to a facility which is affordable and acceptable. It will also lead to frustration for the primary eye care worker. Lack of these services may lead to dissatisfied communities and will be a failure of PHC in general and PEC in particular. These centres are desirable for a population of 250–350,000. The district will become the focus of comprehensive health care and will help in operational research to find out which barriers exist to patients coming forward for secondary eye care services, when patients are followed at regular intervals by primary eye care workers.

The development PEC in such a way will be cost effective and sustainable. The presence/simultaneous development of an appropriate secondary health centre will increase the usefulness of these health services to the communities. Non communicable eye disorders are more common in older age groups, usually accompanied by other systemic diseases which will need attention by other specialists available within the comprehensive health care at district level.

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Epidemiology

Epidemiology in Practice: Randomised Controlled Trials

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Randomised controlled trials are the most straightforward of studies to design and interpret. They are often considered to be the 'gold' standard of clinical and epidemiological studies. This is because, if they are conducted properly, it is often possible to be fairly sure that the results are correct, at least for the type of patients who took part in the study. Good clinical trials are almost always randomised and controlled. The study design need not be limited to clinical situations, however. It is possible to investigate questions of relevance to communities, such as the effect of health education, for example, using a randomised controlled design.

Figure 1 sets out the basic design of a randomised controlled trial. There are many good textbooks on the topic, for example, Pocock's *Clinical trials: a practical approach*.[1] A sufficient number of fairly representative patients are randomly allocated to two or more treatment groups and followed up over an appropriate period of time. The outcome of interest, for example, vision or visual impairment, should be measured by people who do not know to which treatment group the patient was allocated. If possible, the patient should also be unaware of which treatment they have received.

Physicians and patients are often concerned about the ethics of withholding/ subjecting treatment to half the patients. Random allocation of treatment in a randomised controlled trial requires explicit acknowledgement that it is not known which treatment is more effective; this may be difficult for an individual doctor or patient to accept. However, if there is no clinical consensus, with the result that a person may be treated differently depending on which doctor they consult, the study replaces random delivery of health care (at least from the patient's point of view), with a positive contribution to helping future patients. It is better to do a trial when a treatment is new as not only are fewer patients exposed to a treatment that may be dangerous, but also, fewer doctors and patients will have strong beliefs about whether it works. It is important that patients are fully informed as to the advantages and disadvantages of the treatment options, and the fact that treatment will be allocated randomly, before they give their

agreement to take part. They must also understand that if they decline to participate then their health care will not be affected in any way. Otherwise, their consent cannot be considered to be freely given.

Whilst most people are concerned with the ethics of randomisation, it is not well recognised that the proper design, conduct and reporting of trials is also a question of ethics; weakness in these research activities may mean that patients are harmed because incorrect conclusions about treatment are reached.

Trials that are too small are likely to be misleading. Calculations of the required sample size are relatively straightforward but need to be done before the trial begins. A trial that is too small may lead the investigators to conclude that two treatments are equally effective, even if in reality they are different. On the other hand, if a statistically significant result is found in a small study, the estimate of treatment effect may be exaggerated. It is well known that 'significant' results are more likely to be submitted and accepted for publication: this leads to publication bias, particularly of small trials.[2] If a trial is large enough it is more likely to be published, even if the results are negative. Publication bias poses serious problems for people undertaking systematic reviews or meta-analyses which is why considerable effort is now being devoted to the development of complete registers of clinical trials.[3]

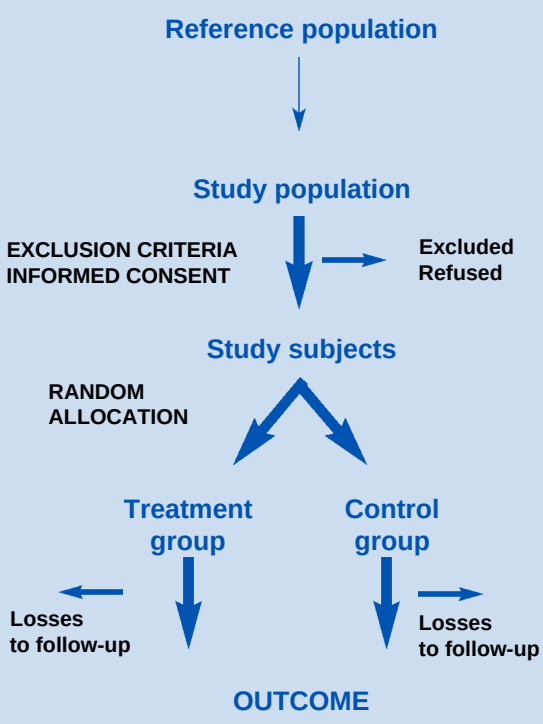
The aim behind randomisation (or random allocation of treatment) is to produce comparable treatment and control groups. If it is effective, both known and unknown confounders* will be equally distributed between the two groups. This is the reason why the randomised controlled trial is such a powerful study design – other epidemiological studies depend on the measurement and statistical analysis of known confounders. Statistical techniques may not always control confounding adequately, especially if the confounding factor is not measured very well.[4] Powerful biases* can be introduced into non-randomised studies, or indeed into randomised studies if clinicians are aware as to which treatment group the next patient is to be allocated.[5] An understanding of the rationale for randomisation is critical, not only for interpreting the results of trials, but also for understanding the problem of interpreting observational non-randomised studies.

Placebos or similar looking treatments aim to conceal the identity of different treatments both from the patient and from the person who assesses outcome. Such masking is more difficult in surgical trials but is not a good reason to avoid randomised controlled trials of surgical interventions. The most important design feature of a trial is to ensure that the allocation of the treatment groups is concealed. This is always possible. Masking the assessment of outcome, which is sometimes difficult in surgical trials, is not essential. There are several good examples of trials of cataract surgery in developing countries that are providing useful information on the risks and benefits of the different types of intraocular lenses.[6]

It isvery important that all trials conducted are reported properly in the medical literature. Several international collaborative efforts are underway to ensure that *all* data collected during trials is made easily available to people making decisions about health care. The CONSORT statement consists of a checklist and flow diagram, intended to assist authors, editors, and reviewers by ensuring that information relevant to the trial is included in any study report.[7] Many of the world's major medical journals, including the BMJ, The Lancet, and Annals of Internal Medicine, have joined together in calling for all unpublished trials to be made available and have provided a mechanism for reporting of unpublished studies.

The reason for conducting trials is to improve patient care. In order for this to happen, patients and doctors need to know the results of these trials. The medical literature is huge and it is difficult to keep up-to-date with all relevant research. The Cochrane Collaboration aims to summarise systematically randomised controlled trials of the effect of health care interventions, and to make these reviews accessible. This means that everyone making decisions about health care, whether patients, doctors or healthcare providers and purchasers, can have available the best possible evidence to assist in their choice.[8]

Figure 1
Design of a Randomised Controlled Trial



Glossary

*** Confounding** occurs when the groups being compared differ with respect to another factor or 'confounder' which is associated with the outcome (or disease) under study. **Bias** may be defined as any systematic error in a study that results in an incorrect result. Both bias and confounding can be thought of as **alternative explanations** for the observed effect.

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Mansonella Streptocerca: Another Filarial Worm in the Skin in Western Uganda

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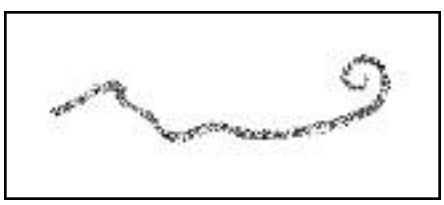
Onchocerciasis, or river blindness, is a disease of public health importance in Uganda. The standard diagnostic procedure for rapid assessment in endemic communities is nodule palpation. The nodules are groups of adult worms in the human host. These nodules can be found on the head, thorax, pelvis, arms and knees.

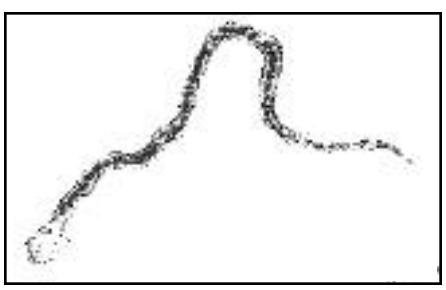


Mansonella streptocerca

Drawing: Caroline McGavin

In Uganda, more than 80% of the nodules are found in the pelvic region. Dermatitis and ocular lesions are commonly associated with the infection and in long standing cases there is blindness, hence the name river blindness for those who are close to rivers in which the vectors are breeding. Skin biopsy which reveals microfilariae is a more specific and sensitive procedure. Since the method carries the risk of transmission of hepatitis and HIV, if sterile procedures are not strictly observed, it is not used for rapid assessment; but is often used for individual diagnosis in laboratories in Uganda.

In Uganda, any microfilariae found in the skin are considered to be *Onchocerca volvulus* since the other filarial worm in the skin, *Mansonella streptocerca*, has so far only been reported from countries in West and Central Africa. Surveys have been conducted in Bundibugyo district in 1994 and 1995. For the first time, *Mansonella streptocerca* was found to be widely distributed in communities in Western Uganda along the Uganda-Zaire border. It was also found in the interior, in villages like Nyahuka and Ntandi, in Bundibugyo district, at altitudes lower than 1000 metres. More than 300 individuals were included in the study and a prevalence of about 60%, ranging from 30–80%, was found. This means that Ugandan laboratories using skin snip for diagnosis of filarial infection have to differentiate between *Onchocerca volvulus* and *Mansonella streptocerca* microfilariae, since the latter may occur in other parts of Uganda. *Mansonella streptocerca* microfilariae are shorter and thinner than those of *Onchocerca volvulus*. The length is two-thirds of the latter. The posterior end of *Mansonella streptocerca* is bent like a shepherd's crook. An experienced laboratory worker can differentiate them without staining.



Onchocerca volvulus

Drawing: Caroline McGavin

Fortunately, on clinical diagnosis there is less likelihood of mixing the two worms. Unlike *Onchocerca volvulus* which forms nodules of adult worms, *Mansonella streptocerca* does not form similar nodules. The *Mansonella streptocerca* microfilariae carriers examined in Bundibugyo had little or no skin disease, and no ocular involvement. Anti-filarial mass treatment appears not to be indicated. This is an accordance with published opinions.

Effects of Ivermectin on *Mansonella Streptocerca*

It has been reported that DEC is effective against the microfilariae and adult worms of *Mansonella streptocerca*, while nothing is known about the efficacy of ivermectin. It was observed in Bundibugyo that a good number of patients with *Mansonella streptocerca* have skin reactions as observed in patients with *Onchocerca volvulus* treated with the same drug. However, the efficacy of this drug on *Mansonella streptocerca* needs further studies, though a good number of patients, who were positive before treatment, showed a lower count of microfilariae or even a zero count after treatment with ivermectin.

Conclusion

It is important that onchocerciasis workers in Uganda are aware of *Mansonella streptocerca* which may be prevalent in their areas. So far mass treatment with ivermectin should not be used in areas with *Mansonella streptocerca* only, since people appear to be suffering more from side effects than untreated infections. However, individual patients seen in health centres who appear to be suffering from *Mansonella streptocerca* may be treated.

Comment

Mansonella streptocerca is a filarial worm which is transmitted to man by biting midges of the genus *Culicoides*. It usually causes no symptoms, but may cause dermatitis, usually affecting the thorax and shoulders. Treatment with diethylcarbamazine (DEC) can lead to an intensely pruritic reaction, as it can with onchocerciasis.

The filarial infection was previously thought to be endemic only in West and Central Africa. The paper by J T Bamuhiiga is the first to report it in East Africa. It is important chiefly because microfilariae of *Mansonella streptocerca* may be mis-identified as those of *Onchocerca volvulus* when found in skin snips. As the figures show, however, the two can be easily distinguished by the characteristic bent tail of *Mansonella streptocerca*.

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The Global Initiative for the Elimination of Avoidable Blindness

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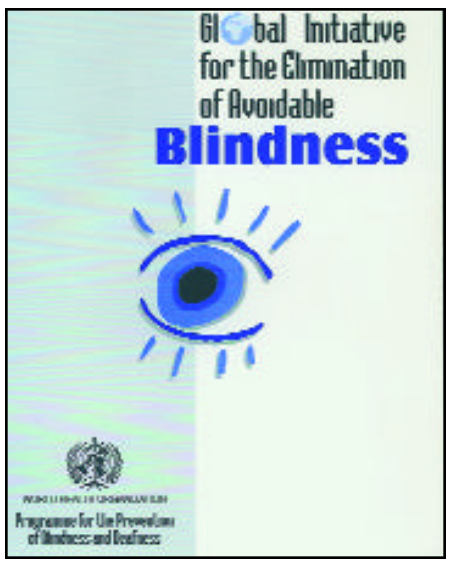
The first of a series of articles on the Global Initiative appeared in Volume 11, Issue No. 25 of the Journal of Community Eye Health.

Bjorn Thylefors described this initiative as a strengthened and accelerated movement for prevention of avoidable blindness, particularly in the developing world, which is home to over two-thirds of those who have such visual disability. The initiative is a collaborative effort of the World Health Organization's Programme for the Prevention of Blindness and Deafness (PBD) and a group of International Non-Governmental Organisations with the common goal of eliminating avoidable blindness by the year 2020, in partnership with committed member countries.



It needs to be acknowledged that despite a half century of efforts commencing with trachoma control activities, the burden of some forms of blindness and visual impairment continues unabated. This may mask the significant advances that have been made collectively by member countries, WHO and other UN agencies, International Non-Governmental Organisations and the private sector, towards the achievement of the goal. However, in spite of progress in science, public health and ophthalmology, blindness remains an important global public health problem.

Political Will, Professional Commitment, Public Awareness

It has been acknowledged that the necessary pre-requisites for a successful initiative against such a major public health problem, includes strong political will, serious professional commitment and a greater awareness among people of the far reaching developmental, social, economic and quality of life implications of needless blindness. Enhancing political, professional and public awareness and interest, would be the first interim goal of the Global Initiative.

To achieve these critical pre-requisites, the first phase of the Global Initiative will include activities to generate awareness among policy makers, the professionals and the public of the magnitude of the blindness burden, at present and its projected escalation in the future. This process of information and sensitisation will take the form of a series of pre-launch activities, preceding phase two which will be a formal launch of the Global initiative.

Phase 1 of the public relations aspect of the Initiative is well underway with the support of a number of Non-Governmental Organisations. The details of the pre-launch and the subsequent launch will unfold over the next few weeks. Future issues of Community Eye Health will provide readers with updated information.

In conclusion, the interim aim of the Global Initiative is to stimulate a groundswell of heartfelt concern and committed action at all levels, from the grassroots community to the highest national policy levels, and indeed internationally, to come to grips with the burgeoning burden of blindness. It will also heighten awareness of the problem of needless blindness in social, developmental, and economic terms and stress that resources, spent in eliminating avoidable blindness, will be a worthwhile investment.

Vision 2020 – The Right to Sight (Pre-launch)

The following organisations have joined in the campaign 'Vision 2020 – The Right to Sight' and agreed to contribute US$10,000 to the pre-launch:

Al Noor Foundation, Asian Foundation for Prevention of Blindness, Christoffel Blindenmission e.V., Foundation Dark & Light, Fred Hollows Foundation, Helen Keller International, International Eye Foundation, Nadi Al Bassar, ORBISInternational,Organisation pour la Pr vention de la C cit , Perkins School for the Blind, Seva Foundation, Sight Savers International, Association for Direct Support to Medical Projects in Developing Countries (SIMAVI), The Lighthouse Inc, and the World Blind Union.

Global Initiative for the Elimination of Avoidable Blindness

This important new document outlines objectives, strategies, indicators and targets for service delivery of eye care, with reference to the most amenable causes of avoidable blindness at the present time. These are Cataract, Trachoma, Onchocerciasis, Childhood Blindness, Refractive Errors and Low Vision. Advice is also given on strategies for the control of other significant causes of blindness. Information on Human Resource Development and Infrastructure and Appropriate Technology is provided. This document will be particularly relevant to programme planners, public health officials, community-oriented eye care professionals and those governmental and non-governmental organisations responsible for developing prevention of blindness programmes.

Copies are available free of charge from both the WHO Programme for the Prevention of Blindness and Deafness and the International Resource Centre. Please write to:

Programme for the Prevention of Blindness and Deafness
World Health Organization
1211-Geneva 27
Switzerland

International Resource Centre
International Centre for Eye Health
11–43 Bath St., London EC1V 9EL
United Kingdom

Aging changes of the optic nerve head in relation to open angle glaucoma

D F Garway-Heath
G Wollstein
R A Hitchings

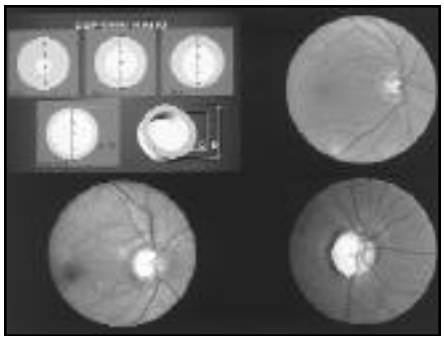
Aims: To determine the age related changes in optic nerve head structure in a group of normal subjects and assess the significance of any changes in relation to those found in open angle glaucoma.

Methods: A group of 88 white volunteers and friends and spouses of patients with a normal visual field and normal intraocular pressure was studied. Two different imaging and measurement devices were used (computer assisted planimetry and scanning laser ophthalmoscopy), and the resultsfromeachwerecompared. Measurements were made of the optic disc, optic cup, and neuroretinal rim areas, and the vertical optic disc diameter and cup/disc diameter ratio.

Results: Neuroretinal rim area declined at the rate of between 0.28% and 0.39% per year. Vertical optic cup diameter and optic cup area increased with age. The mean cup/disc diameter ratio increased by about 0.1 between the ages of 30 and 70 years.

Conclusions: Age related changes are significant and measurable, and should be taken into account when assessing the glaucoma suspect, and when estimating the rate of progression of glaucomatous optic neuropathy in patients with established disease.

Published courtesy of :
Br J Ophthalmol 1997; **81:** 840–5.



Cup-disc ratios and glaucoma. From the ICEH Teaching Slide Set: The Glaucomas

TEACHING SLIDES/TEXT SETS RELEVANT TO PRIMARY EYE CARE
Available from the International Resource Centre of ICEH

- ❑ **Examination of the Eyes** (2nd edition, 1995)
- ❑ **The Eye in Primary Health Care** (2nd edition, 1995)
- ❑ **Practical Ophthalmic Procedures**, Vol 1 (contains 6 procedures)

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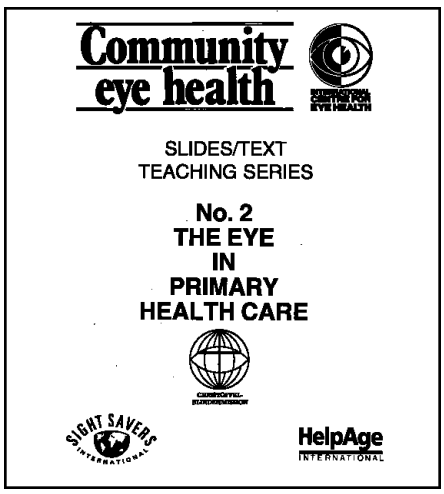
Sue Stevens, International Resource Centre, ICEH,
Institute of Ophthalmology,
11–43 Bath St., London EC1V 9EL, UK

Looking at a teaching slide set
Photo: Murray McGavin



OTHER TEACHING RESOURCES FOR PRIMARY EYE CARE AND RELATED TOPICS

The following teaching resources are available from the addresses given. Limited space will allow for only a selection of titles. Please contact the specific organisation direct for purchasing details, etc. (These details are correct at the time of going to press)

Eye Care at Primary Level
A training manual for medical officers. Available in English only.
DANPCB
A-1/148 Safdarjung Enclave
New Delhi, India

Basic Eye Care
A comprehensive 152-page manual for community eye health workers in remote areas covering the most common eye health problems. A card game, illustrations and 30 slides are included. Available in English only.

Simple Eye Care
A simple easy-to-use 24-page reference booklet for those health workers with minimal formal training in eye care. Available in English and French.
Helen Keller International
90 Washington Street
New York
NY 10006, USA

Hanyane: A Village Struggles for Eye Health
A practical textbook which deals with primary eye care in the context of health and development. Available in English and French from this source. Advice on a Hindi version given on request.
International Resource Centre
ICEH
11–43 Bath Street
London, EC1V 9EL, UK

Primary Eye Care
A slide and text set, suitable for doctors, nurses and primary health care workers, which deals with the recognition and treatment of common eye disorders. Available in English only.
TALC
PO Box 49
St Albans
Hertfordshire, AL1 5TX, UK

Management of Cataract in Primary Health Care
Now in its second edition, this 34-page book outlines a comprehensive strategy to deal with cataract blindness using the primary health care system. Available in English, French and Spanish.

Primary Health Care Level Management of Trachoma
A training manual and 30 colour slides. Suitable for training health workers in the assessment and control of trachoma. Available in English only.

Prevent Blindness through Primary Eye Care
A pictorial coloured poster, for use as a guide and quick reference, dealing with eye injuries, and common eye disorders of acute and gradual onset. Available in English and French.
WHO
Distribution and Sales
1211 Geneva 27
Switzerland

This poem was written by Sarah Manyiraho whose father has experienced many years of pain and distress because of a retained metallic foreign body in a severely damaged eye, injured in 1981 – *Editor*

Hazy Sight

I see everything in blur with strain,
I gaze at the future with pain,
I only gaze and stare but in vain.

Foreseen is forewarned,
Alas! I can't have a glimpse of the future,
I visualise the years to come with fear.

I can't detect the mirage ahead.
I can meditate and imagine I am in hell,
Will I ever overcome the darkness?

I admire with anxiety the opticians,
I merely counsel myself with optimism,
Poor me, is the worst yet to come?

If only those hazy rays could clear,
If only those trails could cease,
Then I would half as much celebrate.

Sarah Manyiraho
Fort Portal
Kabarole
Uganda

Keratomalacia in Northern Afghanistan

Dr Ahmad Zia Aamoon and **Dr Karim Sharif**
Mazar Ophthalmic Centre
Mazar-i-Sharif, Northern Afghanistan

A retrospective study of cases of keratomalacia seen in Mazar Hospital between 1995 and 1997 was undertaken.

Results: Six cases of keratomalacia were seen in 1995, 16 in 1996 and 24 in 1997. More than 50% of the cases were seen during the three months period June–August when malnutrition and other infections, particularly diarrhoea, are at their worst. Cases of night blindness and Bitot spots were also often seen during the study period.

Giving vitamin A to a child in Mazar-i-Sharif, Afghanistan

Photo: M Murtaza Farrahmand

A malnourished child in Afghanistan with keratomalacia of the right eye

Photo: Murray McGavin

Comment: There has been a 400% increase in the number of keratomalacia cases seen in Mazar Hospital during the last three years. This probably reflects the deteriorating health situation of the children, resulting from the continued civil conflict. The majority of the cases are seen during a three month period June–August. This would indicate that the most appropriate time to undertake vitamin A supplementation would be during April or May.

There is a great need to improve the vitamin A status of the under five and even school age children in Northern Afghanistan at the present time.