

**Organization and Management of Health Systems and Services (HSO)
Division of Health Systems and Services Development (HSP)
Pan American Health Organization
World Health Organization**

**Series Organization and Management of Health Systems and Services
Nº 2**

Guidelines for Development of Eye Care Program and Services in the Caribbean

Report for the Workshop held in Trinidad, 21-22, July 1997

PARTICIPANTS

Pan American Health Organization:

Mr Paul Ellis, PWR-Trinidad

Dr. Juan Carlos Silva, PAHO Regional Adviser

Ophthalmological Society of West Indies Committee:

Mr. D.C Gibbons, Barbados

Dr. H.M. Shillingford - Rickets, Dominica

Dr. Deo Singh, Trinidad

Dr. Hugh Vaughan, Jamaica

Dr. Victor Wiedijk, Curacao

CONTENT

| | |
|--|-----------|
| EXECUTIVE SUMMARY | ix |
| <i>For Healthy Population with No Known Eye Disease</i> | <i>ix</i> |
| Children | ix |
| Adults | ix |
| High Risk Groups | x |
| <i>People with Symptoms or Eye Diseases</i> | <i>x</i> |
| INTRODUCTION | 11 |
| 1. EYE CARE GENERALITIES | 1 |
| <i>1.1 POLICY GUIDELINES</i> | <i>1</i> |
| 1.1.1 National Commitment | 1 |
| 1.1.2 Primary Eye Care | 1 |
| 1.1.3 Appropriate Technology | 2 |
| 1.1.4 Human Resource Development | 2 |
| 1.1.5 Epidemiological Assessments and Priority Setting | 2 |
| 1.1.6 Monitoring, Evaluation and Quality of Care | 3 |
| 1.1.7 Collaboration with Non Government Organizations | 3 |
| 2. CHILDHOOD EYE CARE AND PREVENTION OF BLINDNESS | 5 |
| <i>2.1 Magnitude of the Problem</i> | <i>5</i> |
| <i>2.2 Problems Affecting Childhood Blindness Prevention</i> | <i>5</i> |
| <i>2.3 Problems Affecting the Eye Care Provision for the School Children</i> | <i>6</i> |
| <i>2.4 Policy</i> | <i>6</i> |
| <i>2.5 Regional Strategy</i> | <i>6</i> |
| 2.5.1 Research and improvement of knowledge | 6 |
| 2.5.2 Prevention of childhood blindness program | 6 |
| <i>2.6 Brief Description of Prevention of Childhood Blindness</i> | <i>7</i> |
| 2.6.1 Rop Screening, Treatment and Follow Up | 7 |
| 2.6.2 Congenital Cataract and Glaucoma - Screening and Management | 7 |
| 2.6.3 Conjunctivitis of the New Born - Prevention and Treatment | 7 |
| 2.6.4 Toxoplasmosis and Rubella - Prevention | 7 |
| 3. PREVENTION OF BLINDNESS FROM GLAUCOMA IN LATIN AMERICA AND THE CARIBBEAN | 9 |

| | |
|---|-----------|
| 3.1 Introduction | 9 |
| 3.2 Prevalence and Public Health Impact | 9 |
| 3.3 Limitations of Glaucoma Detection and Management | 10 |
| 3.3.1 Disease Frequency | 10 |
| 3.3.2 Availability of Sensitive and Specific Screening Methods at Reasonable Cost | 10 |
| 3.3.3 Effectiveness of Early Detection and Treatment | 10 |
| 3.3.4 Service Development and Cost Implications of Treatment | 10 |
| 3.4 Policy | 11 |
| 3.5 Regional Strategy | 11 |
| 3.5.1 Research | 11 |
| 4. EYE CARE AND PREVENTION OF BLINDNESS IN DIABETES MELLITUS | 13 |
| 4.1 Problem Magnitude | 13 |
| 4.2 Difficulties in the Prevention of Blindness in Diabetes | 13 |
| 4.3 Eye Care Policy in Diabetes | 13 |
| 4.4 Regional Strategy | 13 |
| 4.4.1 Research | 13 |
| 4.4.2 Prevention of Blindness Programs | 14 |
| 4.5 Prevention of Blindness Scheme | 14 |
| 4.5.1 Cases detection | 14 |
| 4.5.2 General Ophthalmologist Management | 14 |
| 5. EYE CARE AND PREVENTION OF BLINDNESS FOR THE ADULTS AND ELDERLY | 15 |
| 5.1 Problem Magnitude | 15 |
| 5.2 Difficulties in the Prevention of Blindness in Adults and Elderly | 15 |
| 5.3 Eye Care Policy for Adults and Elderly | 15 |
| 5.4 Regional Strategy | 16 |
| 5.4.1 Research | 16 |
| 5.4.2 Development | 16 |
| 5.4.3 Cases detection | 16 |
| 5.4.4 Treatment | 16 |
| 6. LOW VISION CARE IN LATIN AMERICA AND THE CARIBBEAN | 17 |
| 6.1 Developing the Strategy | 17 |
| 6.2 Magnitude of the Problem | 17 |
| 6.3 Definition of Low Vision | 17 |
| 6.4 Problems Affecting the Low Vision Care Services | 17 |

| | |
|---|-----------|
| 6.5 <i>Regional Eye Care Policy in Low Vision</i> | 18 |
| 6.6 <i>Regional Strategy</i> | 18 |
| 6.6.1 Health Services Development | 18 |
| 6.6.2 Human Resources Development | 19 |
| 6.6.3 Public Education and Awareness Programs | 19 |
| 7. BLINDNESS AND VITAMIN A DEFICIENCY PREVENTION | 21 |
| 7.1 <i>Magnitude of the Problem</i> | 21 |
| 7.2 <i>Causes of the Problem</i> | 21 |
| 7.3 <i>Target for the Next Decade</i> | 21 |
| 8. HUMAN RESOURCES DEVELOPMENT | 23 |
| 8.1 <i>Ophthalmologist</i> | 23 |
| 8.1.1 Objectives | 23 |
| 8.1.2 Strategies | 23 |
| 8.2 <i>Ophthalmic Medical Assistants (OMA)</i> | 23 |
| 8.2.1 Objectives | 23 |
| 8.2.2 Strategies | 23 |
| 8.3 <i>Other Medical Staff</i> | 24 |
| 8.3.1 Objectives | 24 |
| 8.3.2 Strategies | 24 |
| 8.3.3 Optometrist | 24 |
| 8.3.4 Other Health Personnel | 24 |
| 8.4 <i>Managers</i> | 24 |
| 8.4.1 Objective | 24 |
| 8.4.2 Strategies | 24 |
| 8.5 <i>Equipment Technicians</i> | 24 |
| 8.5.1 Objective | 24 |
| 8.5.2 Strategy | 24 |
| 9. INFRASTRUCTURE AND APPROPRIATE TECHNOLOGY DEVELOPMENT | 25 |
| 9.1 <i>Infrastructure</i> | 25 |
| 9.1.1 Objective | 25 |
| 9.1.2 Strategies | 25 |
| 9.1.3 Indicators | 25 |
| 9.2 <i>Technology</i> | 26 |
| 9.2.1 Objectives | 26 |

EXECUTIVE SUMMARY

The Health Care Reform initiated in most countries in the Region of the Americas has been generating the need of designing Health Care Packages in order to assure for the future, that every citizen have access to the necessary medical care benefits. This document pretends to describe the desirable Eye Care Benefit Package and Eye Care Policy to be included in the National Health Care Plans, it includes preventive measures that detects disease early in high risk groups through screening at appropriate intervals. The document also describes the suggested eye care treatments and rehabilitation measures. The application of the Eye Care Policy will assure eye health and good vision for the entire population. However, as this document presents the desirable Eye Care Policy it represents in essence suggested goals which territories should seek to attain. It will obviously not be possible for any territory to achieve all these goals immediately. It is therefore recommended that governments should shall coordinate with the Eye Care National Committees and local ophthalmologists to determine the priority areas in each territory.

For Healthy Population with No Known Eye Disease

Children

- It is recommended to do an eye exam by an ophthalmologist to all premature babies under 1200 gm or new born with congenital abnormalities.
- It is desirable to do a primary eye care evaluation by trained health care personnel as the pediatrician, to all new born and six months old babies with emphasis in congenital cataract and glaucoma, tumors, strabismus and fixation. That examination should be documented in the health care card.
- All children entering in school should have an eye exam or at least a visual acuity test by trained health personnel.
- Between the ages of 6 and 18 is convenient to do a visual acuity test every 3 to 4 years.

Adults

- In healthy adults between 19 to 35 at least one eye exam should be performed.
- Healthy adults between 35 and 65 should have an eye exam by an ophthalmologist at least every four years and after the age of 65 every two years.

High Risk Groups

- The intervals of the eye exam in people with family history of systemic or ocular diseases, use of systemic pharmaceutical products with ocular effects, risk of trauma at the work place should be determined by a physician.

People with Symptoms or Eye Diseases

The following people should be referred to an eye exam by an ophthalmologist from the primary health system:

- People that can not improve their visual acuity with a refractive correction, eye trauma, painful eye, reduction or distortion of visual acuity, floaters, flyers, flashes and all perception symptoms, tearing eyes, painful orbit or lids, double vision, eye secretions, strabismus, glaucoma, cataract, diabetes, thyroid disease and AIDS.
- People with detected eye disease, refractive errors should receive scientifically and internationally approved treatments. The intervals of the follow ups should be decided by the ophthalmologist.

INTRODUCTION

This document intends to gather all the necessary technical input from the WHO Global and PAHO Regional Programs for Eye Care and the Prevention of Blindness in conjunction with the Ophthalmological Society of West Indies in order to serve as a guideline for the countries in the development of their own National Plans and Policies. Some of the recommendations represent ideal situations that each country shall adapt according to its own realities and degree of development in a given time frame.

1. EYE CARE GENERALITIES¹

Blindness and low vision constitute a mayor public health problem world-wide and particularly in developing countries which make up the bulk of the world population.

It is estimated that globally there are 38 million persons who are blind with an additional 110 million with low vision. Thus there are presently close to 150 million people with severe visual disability world wide. In nearly two thirds of these sight could be restored such as those unoperated cataract or the visual impairment from Trachoma, onchocerciasis, xerophthalmia, glaucoma, diabetic retinopathy and trauma could be prevented. The needless continuing toll of such avoidable blindness presents a mayor challenge to governments that have the prime responsibility, in collaboration with the international community, to assist in ensuring health, including eye health of its population.

Visual disability has far reaching individual, social and economic consequences impeding development in childhood and productivity in adulthood, with functional and quality of life implications across the whole life spectrum.

Cost effective technologies are available to prevent, control or minimize visual impairment from most disorders. What is wanting is the political will and professional commitment for the delivery and application of these technologies to populations in need.

1.1 POLICY GUIDELINES

1.1.1 *National Commitment*

The promotion of eye health as part of the national health policy is, invariably, a necessary prerequisite for a National Programme development for the Prevention of Blindness. In so doing not only is public awareness fostered, which in turn leads to societal responsiveness and participation, but also coordination of activities carried out by various partners, such as non-governmental organizations, the private sector and the government itself, is ensured.

1.1.2 *Primary Eye Care*

Primary Eye Care ensures the provision of eye health promotion and protection, facilitates the prevention and control of visual impairment conditions, curative treatment and rehabilitation. It also provides the basis for striving towards equity, community participation, intersectoral collaboration and long term sustainability of programs.

1.1.3 *Appropriate Technology*

Prevention of Blindness programs should adopt the principle of appropriate technology in widest sense, of being based on “scientifically sound and socially accepted methods and technologies.” This ensures that the greatest benefit accrues to the largest number of people, within the limited resources available. Thus interventions for cataract blindness using active outreach screening methods and institution based large volume surgery, maximizes efficiency and becomes cost effective. The promotion of technology transfer to developing countries for production of intra ocular lenses (IOLs) at low cost, has been a mayor breakthrough in applying modern surgical techniques in cataract surgery to large sections of the population. Production of low cost spectacles and the local production of medications are further examples of application of appropriate technology, with great benefit to those in need.

1.1.4 *Human Resource Development*

Human resources consisting of a number of categories of trained personnel comprise a key element in national programs. While ensuring the optimal utilization of existing personnel, policy guidelines dictate that training of personnel should be task specific and community oriented.

Wherever possible, a long term human resources plan, for eye care, based on community needs, should be developed, within the overall context of national human resource development for health.

1.1.5 *Epidemiological Assessments and Priority Setting*

Knowledge of the magnitude and causes of visual impairment in countries is an important prerequisite for programme planning and priority setting. Cost effective methodologies have been developed for surveys of blindness and visual impairment and applied in member countries.

Given the various causes of blindness and the wide variation in their distribution between and even within the countries, a rational approach has to be taken in setting priorities, both in terms of the diseases, as well as geographical regions or communities, that need to be targeted for intervention. The marginalized and indigent populations especially the elderly and women, both categories being at higher risk of blinding diseases, would be a priority group.

Among diseases, cataract, and diabetic retinopathy, lend themselves to interventions that have been shown to be cost effective with proven beneficial outcomes. Priority should be extended for these conditions within national programmes, if the disease burden warrants it, as being a public health problem. Other priorities include low vision services for children and the elderly particularly in developing countries, the provision of such services, requires attention.

1.1.6 *Monitoring, Evaluation and Quality of Care*

These elements within national programme planning and development deserve special mention, both in the context of eye health care delivery and also respect of specific interventions. Evaluations would include not only output measures but also functional and quality of life assessments including where possible appraisal of cost effectiveness. Operational research studies constitute an important aspect of such evaluations.

1.1.7 *Collaboration with Non Government Organizations*

International nongovernment development organizations including service organizations are partners in the global effort to prevent and control avoidable visual disability world-wide. Efforts at collaboration, cooperation and coordination at the International, Regional and national levels should be fostered in order to optimally utilize the collective resources of these organizations. Appropriate mechanisms could be set up to facilitate the activities to be carried out towards achieving the common objective of preventing blindness and visual disability.

2. CHILDHOOD EYE CARE AND PREVENTION OF BLINDNESS²²

2.1 *Magnitude of the Problem*

The children population in Latin America and the Caribbean is around 160 million. The estimated prevalence of blindness and severe visual impairment is of 0.2 to 1 for every 1000 depending on the socioeconomical development of the individual communities. It is estimated that blindness affects some 100.000 children in Latin America and the Caribbean with severe consequences for their development and education. Childhood Blindness data collected from schools from the blind revealed that between 34 and 44% of childhood blindness are preventable

or treatable. The most common treatable diseases are Congenital Cataract (incidence 10 per million per year), Congenital Glaucoma (incidence of 3 millionper year), and ROP (incidence 10 treatable cases per million per year).

The most common preventable causes are Rubella, Toxoplasmosis and Ophthalmia Neonatorum.

Timely detection of children's eye diseases in the Region is very limited and diagnosis generally occurs when the disease is already in advance or irreversible stages.

Uncorrected refractive errors affects about 9 to 20% of the school children in Latin America with severe consequences for their development and quality of life. Other pathologies are strabismus, amblyopia, chorioretinal scars etc. Even in the most developed countries of the region, high percents of children presenting ocular pathology in screening, never had an eye exam.

2.2 Problems Affecting Childhood Blindness Prevention

- The insufficiency of data and information concerning visual loss and childhood blindness in Latin America and the Caribbean.
- Lack of policies that include the eye care component in the Maternal and Child care programs
- Lack of awareness and knowledge among the pediatricians, obstetricians, general physicians and health personnel about their roll in prevention of childhood blindness.
- The general ophthalmologists are not involved in prevention of childhood blindness programs.

2.3 Problems Affecting the Eye Care Provision for the School Children

- Lack of policies that include the eye care component in the school children.
- Lack of ophthalmologic and optometry services that diagnose refractive errors in the school children of low socioeconomical status.
- Spectacles are often too expensive for the majority of patients.

2.4 Policy

- Prevention of the preventable causes, early diagnosis, evaluation and treatment of treatable causes of childhood blindness are integral aspects of all national maternal and childhood health care plans and policies.

- Prevention of visual impairment and blindness due to uncorrected refractive errors in school children is an integral part of the basic education health care policies.

2.5 Regional Strategy

2.5.1 *Research and improvement of knowledge*

- To collect and analyze information on causes of childhood blindness in blind school children utilizing the appropriate documentation.
- To document the changing patterns by monitoring new cases entering the blind school each year.

2.5.2 *Prevention of childhood blindness program*

- Establish an appropriate program for preventing avoidable childhood blindness particularly from congenital cataract and glaucoma, ROP and ophthalmia neonatorum.
- Promote awareness among ophthalmologists, pediatricians and community about childhood blindness with emphasis in ROP, congenital cataract and glaucoma.
- Establish low vision services for those blind or with severe visual impairment.
- Detection and treatment of uncorrected refractive errors in school children.
- Establish screening methods during the first school level between 5 and 6 years of age.
- Establish refraction services and low cost spectacles provision.

2.6 Brief Description of Prevention of Childhood Blindness

2.6.1 *Rop Screening, Treatment and Follow Up*

All neonates under 1200 gm should be screened the ophthalmologist in coordination with the pediatrician and if necessary provide treatment according to the international accepted procedures.

2.6.2 *Congenital Cataract and Glaucoma - Screening and Management*

All the neonates and infants under 1 year of age attending to the pediatric clinic should be screened following the clinical assessment as follows:

- Observe the child, check for fixation, following and nystagmus.

- Irritable eye: lacrimation, photophobia and redness.
- Cornea: diameter greater than 12mm, hazy.
- Examine leukocoria with retinoscope.
- Cupping of the optic disc.
- In case of abnormalities: Examine parents.
- If any abnormality is detected refer the patient to any ophthalmology department for treatment and follow up.

2.6.3 *Conjunctivitis of the New Born - Prevention and Treatment*

Primary prevention of gonococcus or chlamydial conjunctivitis of the new born is best achieved by identifying and treating infected pregnant women. Prophylaxis involves careful cleaning of the eyes immediately after birth, followed by the application of an antiseptic or antimicrobial agent to the conjunctiva. The type of pharmaceutical product to be used should be consulted with the national or local society of ophthalmology.

2.6.4 *Toxoplasmosis and Rubella - Prevention*

Establishing Rubella immunization programs will prevent blindness secondary to a such disease.

Three methods of screening and a method of treatment are available however there is no a consensus at the international level on methods of diagnosis and treatment.

3. PREVENTION OF BLINDNESS FROM GLAUCOMA IN LATIN AMERICA AND THE CARIBBEAN³³

3.1 Introduction

Among all different types of glaucoma, primary open-angle glaucoma (OAG) is the most frequent among adults. The disease is characterized by progressive atrophy of the optic nerve, with concomitant loss of the visual field. Current diagnostic criteria are based on the presence of characteristic defects of the visual field and optic disc changes, regardless of the level of intraocular pressure.

Despite extensive research, the aetiology and natural history of OAG are not well understood. Major risk factors are older age, African descent, higher intraocular pressure and family history of the disease. The possible role of diabetes, vascular and other factors remains unclear. Genetic factors are responsible for early-onset or juvenile glaucoma, which is relatively infrequent, but have not been identified for the most common adult-onset form of the disease. In fact, the

aetiology of OAG may involve gene- environment interactions.

3.2 Prevalence and Public Health Impact

Based on WHO estimates, glaucoma is the third major cause of global blindness and accounts for about 6 million blind, or 13.5% of all blindness. However, glaucoma blindness is much higher in black populations, where is the first cause. In addition to causing blindness, OAG leads to irreversible loss of the visual field, thus being an important cause of visual impairment throughout the world.

Among the population over 40 years of age, the prevalence of OAG has been found to be under 1% to 2% in whites and about 4% to 8% in persons of African descent. Data on incidence are very limited, but estimates suggest that the risk of developing glaucoma in whites is low and increases with age, reaching about 0.20%-0.25% per year at ages 55 and over. Incidence rates are expected to be 3 to 4 times higher in the black population.

In the Caribbean, however, OAG has a high prevalence, as documented by population-base data from the Barbados Eye Study and the St. Lucia Study. In both studies, OAG prevalence in Afro-Caribbeans over 40 years of age was over 7% and increased with age. In the Barbados Eye Study, OAG affected 1 in 11 Afro-Caribbean older than 50 years of age, reaching a prevalence of 1 on 6 in those over 70 years. In addition, 3.7% had suspect and 12.7% had ocular hypertension (intra ocular pressure over 21 mmHg without glaucomatous visual fields or discs). About 2% of individuals over 40 years were blind using WHO criteria (visual acuity worse than 20/400), and over one third were blind from OAG. Preliminary data from that study also suggest that the incidence of OAG is high in that population, reaching over 1% per year at older ages. Therefore OAG is a major public health problem in the Afro-Caribbean population, where it is a major cause of visual loss.

3.3 Limitations of Glaucoma Detection and Management

3.3.1 *Disease Frequency*

In populations with low prevalence and no risk factors a major issue to consider is the potential low yield of screening.

3.3.2 *Availability of Sensitive and Specific Screening Methods at Reasonable Cost*

Most of the epidemiological studies that detected OAG by standardized assessment of the optic disc, visual field, and tonometry, found that only half of OAG cases were previously diagnosed, a fraction that is remarkably constant in most populations. These studies also showed that only about half of OAG cases have intraocular pressures above screening levels (varying across populations) and that about half were over 65 years of age. Tonometry has a very low sensitivity and is not recommended as an effective screening method. Its sensitivity is higher in Afro-Caribbean populations, where most OAG present with intraocular pressures over 21mmHg, but specificity may be lower due to high frequency of ocular hypertension. Perimetry is costly and

time consuming and has low specificity, specially at older ages. Ophthalmoscopy or fundus photography can be used to detect optic disk pathology, but require specialized training and resources. It can be concluded that single screening methods seem ineffective.

3.3.3 *Effectiveness of Early Detection and Treatment*

Although it is generally believed that intraocular pressure-lowering treatment will control the progression of OAG, there is no information on the magnitude of a such benefit, especially on the value of treating early cases with moderately elevated pressures.

3.3.4 *Service Development and Cost Implications of Treatment*

Once the diagnosis of OAG is established, medical or surgical treatments are needed, both require the service of an ophthalmologist. The most common practice is the initial medical treatment, which is costly, life-long, and can result in adverse effects to the medications. A major issue is that of non-adherence to treatment, which in turn may result in failure to control OAG. When medical treatment is ineffective, filtering surgery and laser trabeculoplasty may be used. Surgical approaches have several advantages and have been proposed as an initial medical treatment. However they also have some drawbacks, including possible complications, the need for careful follow-up and possible re-operations.

3.4 Policy

The detection and treatment of glaucoma in segments of the population with risk factors, should be part of the national eye care programs.

3.5 Regional Strategy

3.5.1 *Research*

- Further research on detection and treatment methods is being conducted and may lead to improved and cost-effective approaches.
- Additional research is needed to evaluate different approaches to treatment.
- Promote and develop programs to detect and control OAG on high risk groups, such as Afro-Caribbeans, older persons and those with family history. These detection efforts can be implemented in the context of a comprehensive ophthalmologic examination which may have the additional benefit of detecting other eye pathology.
- Once the diagnosis of OAG is established, medical or surgical treatments should be established according with the ophthalmologist criteria.
- For cases under medical treatment, efforts should be directed to enhance compliance with

prescribed medications. It is also important to develop programs of provision of low cost medications.

4. EYE CARE AND PREVENTION OF BLINDNESS IN DIABETES MELLITUS⁴⁴

4.1 Problem Magnitude

Diabetes Mellitus compromise all the tissues in the organism including the eyes. The prevalence of diabetes is increasing; currently 3% of the population has the diagnosis and it is estimated that another 3% of undiagnosed cases are present. It is estimated that 50% of diabetics present diabetic retinopathy through his or her life time. As much as 25% of patients suffering type 1 for 15 years presents proliferative diabetic retinopathy. Diabetic retinopathy constitutes 10% of the causes of blindness that accounts for more than 9.000 blind years per million population.

4.2 Difficulties in the Prevention of Blindness in Diabetes

- Poor medical management and control of diabetes despite the irrefutable evidence that good control may prevent 70% of retinopathy and other systemic complications.
- Lack of awareness and knowledge of the general physicians and internists regarding their role in the prevention of blindness due to diabetes.
- The detection and referral systems are not well developed.
- Limited number of ophthalmologists with training in diagnosis and treatment of diabetic retinopathy.
- The technological infrastructure in the services is poor.

4.3 Eye Care Policy in Diabetes

Early detection and treatment of the ocular complications in Diabetes, should be part of the national health care and chronic diseases control programs.

4.4 Regional Strategy

4.4.1 Research

- Collect and analyze prevalence and incidence data on ocular complications in the countries.

- Make an inventory of the available human and technical resources to develop a control disease program.

4.4.2 *Prevention of Blindness Programs*

- Early detection and treatment of diabetes and hypertension will prevent complications that lead into blindness.
- Develop educational programs for diabetics and community in general.
- Include education for medical students in Diabetic Eye Disease in the training programs of the Schools of Medicine.
- Educate and motivate general physicians in how to follow the referral schemes.
- Development of continuing medical education programs for general ophthalmologists.
- Development of Retina Services that include trained ophthalmologists and technological infrastructure.

4.5 *Prevention of Blindness Scheme*

4.5.1 *Cases detection*

- All people with a diagnosed Diabetes between the ages of 0 to 30 should have an annual eye exam for their life time starting five years after the diagnosis.
- All people with a diagnosed Diabetes after the age of 30 should have an annual eye exam for their life time starting immediately after the diagnosis.
- Every diabetic woman planning to be pregnant should have an eye exam by ophthalmologist.
- Every pregnant diabetic woman should have an eye exam early in pregnancy.

4.5.2 *General Ophthalmologist Management*

- The general ophthalmologist has the responsibility to make the follow up on diabetics, evaluate symptoms and clinical signs and if necessary the diagnostic tests. It is desirable to have a referral service with laser or vitrectomy.
- The special tests request should be done under the ophthalmologist criteria.

5. EYE CARE AND PREVENTION OF BLINDNESS FOR THE ADULTS AND ELDERLY⁵⁵

5.1 Problem Magnitude

Results of the Barbados Eye Study show that 12% of people, 40-84 years had visual impairment or visual acuity worse than 6/12, most had cataract or lens opacities, thus demonstrating that most of the visual impairment in this population is associated with lens opacities. In the 3% of the people with severe visual impairment (VA < 6/60) also was associated with lens opacities but not necessarily caused by cataract and lens opacities. A similar pattern was found in the 2% with more extensive visual loss (visual acuity of 6/120 or worse). The percent of severe impairment increased with advancing age. In general Lens opacities were found in 44%. At the international level it is accepted that about 50% of blindness and low vision is due to unoperated cataract. It is estimated that per every million population the incidence of blinding cataract is of 600 new cases per year, and a prevalence of 3000. Open Angle glaucoma was found in 7% (requiring both visual field loss and optic disc pathology for diagnosis, regardless of intra ocular pressure) and often accompanied by visual acuity loss (see glaucoma chapter). Other blinding diseases are the diabetic retinopathy(see DR chapter) and age related macular degeneration. Almost all people over 50 suffer symptoms of presbyopia.

5.2 Difficulties in the Prevention of Blindness in Adults and Elderly

- Poor public awareness about eye care, and how most of blinding diseases are curable or preventable with simple methods and treatments.
- Lack of knowledge by general practitioners and internists regarding their role in prevention of blindness and low vision in the elderly.
- There are numerous barriers between the needs of adults and elderly and the services, including reduced availability and accessibility and high costs.

5.3 Eye Care Policy for Adults and Elderly

Early detection and treatment of eye diseases in the elderly should be integral part of the National Health Plans for Adults and Elderly. In addition eye care should be part of the health programs at the nursing homes and day care institutions.

5.4 Regional Strategy

5.4.1 Research

- Collect and analyze data on incidence and prevalence of eye pathology in the elderly.

- Make an inventory of human and technical resources available in each country to provide eye care to the adults and elderly.

5.4.2 Development

- Development of the National Programs for the Prevention of Blindness with emphasis in age related cataract, glaucoma and diabetic retinopathy.
- Development of a public awareness programme.
- Development of a primary eye care system within the primary health system to detect reduced visual acuity, painful eye, red eye, conjunctivitis and double vision. The ophthalmologist role is to educate the health personnel in early detection, simple treatments and good referrals.
- Development of an specific programs in Glaucoma and Diabetic Retinopathy (see special chapters), the provision of low cost spectacles for refractive errors and presbyopia and a cataract program as follows:

5.4.3 Cases detection

- All people over 45 years should have an ophthalmological evaluation every 4 or 5 years and those over 65 every 2 or 3 years.
- If the access to the ophthalmologist is limited a visual acuity test should be performed by primary eye care personnel with the same periodicity and refer those with visual acuity of less than 20/400 (6/120) in the best eye to the ophthalmology service.

5.4.4 Treatment

- It is estimated that to control the prevalence and incidence of blinding cataract, 2000 operations should be performed per year per million population.
- The cataract service should be available and accessible to the patients through programs.
- The cataract service should be affordable to all patients.
- It is desirable to use intraocular lenses as part of patients immediate rehabilitation.

6.1 Developing the Strategy

In April, 1994 the Pan American Health Organization (PAHO) regional office of the World Health Organization (WHO) convened a working conference on the management of low vision in Bogota, Colombia. This conference had as its main goal “the development of recommendations for a regional policy regarding low vision services in Latin America and the Caribbean.”

6.2 Magnitude of the Problem

The magnitude of the low vision problem in the region is not clearly defined because the lack of epidemiological data. Prevalence estimates were derived based on the formula developed at the WHO Conference on Management of Low Vision in Children, Bangkok, 1992. It is estimated that approximately ten million persons are visually handicapped, four million of whom have visual limitations due to treatable cataracts and six million with low vision. The other main causes of visual impairment are glaucoma, diabetic retinopathy, and infantile blindness.

6.3 Definition of Low Vision

The working definition of low vision adopted by the WHO Conference on Management of Low Vision in Children, Bangkok, 1992 is as follows:

A person with low vision is one who has impairment of visual functioning even after treatment and/or standard refractive correction, and has a visual acuity of less than 6/18 (20/50) to light perception, or a visual field of less than 10 degrees from the point of fixation, but who uses, or is potentially able to use, vision for the planning and/or execution of a task.

6.4 Problems Affecting the Low Vision Care Services

- Lack of government policy for visual rehabilitation, environment modification to facilitate mobility by persons with low vision and the provision of economic viability and sustainability of persons with impaired vision.
- The insufficiency of data and information concerning low vision in the Region.
- Limited public and eye care professionals awareness on low vision care.
- The insufficiency of professional and technical providers of care in this speciality.
- Inequitable geographical distribution of insufficient services.
- Lack of affordable optical devices for assessment and prescription.

- The insufficiency of both rehabilitation and educational services for people with low vision and the need to encourage the provision of a such services.
- Lack of adapted teaching materials for students with low vision.

6.5 Regional Eye Care Policy in Low Vision

To provide comprehensive low vision care services for people in Latin America and the Caribbean by strengthening existing services and developing new ones in need.

6.6 Regional Strategy

The strategy fall into three categories:

6.6.1 *Health Services Development*

- To develop national eye care policies that include low vision care. Promote the commitment of economic and political leaders in Latin America and the Caribbean to a prevention of blindness program which include a comprehensive low vision component
- Improve identification of persons with low vision by developing and introducing simple methods of measuring visual acuity and increasing the awareness of existing personnel through meetings, publications, workshops, curriculum development and training.
- Develop comprehensive and practical referral systems and improve communication among providers of low vision services.
- Establish specialist units that can provide comprehensive low vision care.
- Create regional or national funding bases for the purchase of devices.
- Promote special low vision services for children as early as possible through an integrated care system of clinical and pedagogic services.
- Develop programs for the economic sustainability of persons with low vision.
- Encourage through situation analyses, the documentation of available personnel and services in each country and, therefore, identify those countries with the best conditions for regional training programs, regional production of optical and other devises and regional low vision treatment centers.

6.6.2 *Human Resources Development*

- Develop specific continuing education programs in low vision care for existing available personnel.
- Identify appropriate personnel and train them to perform low vision examinations, assess patients' physiological and sociological status, prescribe optical devices and provide instruction in device use.
- Organize courses, seminars, workshops, etc., to acquaint ophthalmologists and ophthalmic technicians with education and rehabilitation resources.
- Review and expand low vision curriculum at ophthalmology and public health training institutions.
- To produce trainers capable of sustaining local professional educational efforts.

6.6.3 Public Education and Awareness Programs

- Enhance the provision of low vision care by promoting and supporting public education directed to individuals and families.
- Facilitate the integration of persons with low vision in the work force through an awareness building process for employers and employees as well as tax exception, credits or similar incentives.

7. BLINDNESS AND VITAMIN A DEFICIENCY PREVENTION⁷⁷

7.1 Magnitude of the Problem

Globally, vitamin A deficiency remains the leading cause of preventable visual impairment and blindness among children. It also contributes substantially, even at sub-clinical level, to increased severity of some infections and risk of death, particularly from diarrhea and measles. Clinical deficiency of vitamin A is less prevalent in the Caribbean than in other Regions of the world. Clinical deficiency among preschool age children is a problem of public health in the Dominican Republic and Haiti. No recent data are available for several countries of the region, most of which are not expected to have a significant subclinical problem.

7.2 Causes of the Problem

Poverty is the root cause of Vitamin A deficiency contributing to an insufficient intake of foods containing bio-available Vitamin A by children and to an unsanitary environment that favors frequent infections. Diarrhea and other infections therefore, are frequent precipitating factors for

vitamin A deficiency, including xerophthalmia, which may progress to corneal ulceration, and if cornea becomes infected, to keratomalacia and irreversible blindness. Measles is particularly associated with precipitation of vitamin A deficiency and blindness.

7.3 Target for the Next Decade

Because both subclinical and clinical Vitamin A deficiency cause disability and contribute to childhood death, the target of the Region is to eliminate all clinical deficiency as a public health problem and to reduce the subclinical deficiency (less than 0.7 umoldl).

Achieving these targets will require not only improved dietary intake of vitamin A but also a reduction in prevalence of infectious diseases through improved environmental sanitation and personal hygiene practices.

8. HUMAN RESOURCES DEVELOPMENT⁸⁸

8.1 Ophthalmologist

8.1.1 Objectives

- To utilize the current resources in providing an effective and efficient eye care services.
- The minimum ratio should be one ophthalmologist per 50.000 population. In some specific countries the ratio can be modified according to the demographic distribution.

8.1.2 Strategies

- Increase quality and productivity of existing training centers for ophthalmologist.
- Attract and retain staff through appropriate incentives including career structure and remuneration.
- OSWI will identify the ophthalmological training needs periodically to alert national authorities. Special attention should be given to Guyana and Haiti. Train young ophthalmologists when necessary.
- To utilize the expertise of OSWI members for training programs and continuing educational programs.

8.2 Ophthalmic Medical Assistants (OMA)

8.2.1 Objectives

- To improve services effectiveness and efficiency through ophthalmic assistants work under the ophthalmologist supervision and under their own hierarchy system (Assistant, Technician and Technologists).
- There should be at least 1 ophthalmic nurse for every 20.000 population.

8.2.2 Strategies

- Establish OMA - Ophthalmic nurse training in eye care, based on services needs.
- Secure funded posts for trainees.
- Integrate OMA Ophthalmic nurse services in health care systems.

8.3 Other Medical Staff

8.3.1 Objectives

- All medical graduates to be trained in basic eye care.

8.3.2 Strategies

- OSWI to work towards including core ophthalmology content in medical curriculum and postgraduate medical education, using appropriate available models.

8.3.3 Optometrist

- The role of the optometrists and opticians in the eye care delivery systems in the Caribbean should be defined.

8.3.4 Other Health Personnel

- The role should be defined at the national level

8.4 Managers

8.4.1 Objective

- To provide training in basic principles of management for medicalparamedical staff

8.4.2 Strategies

- Short courses in planning and management for eye care at the regional and national level.

8.5 Equipment Technicians

8.5.1 Objective

- To develop manpower for equipment maintenance repair, low cost spectacle production and eye drops preparation.

8.5.2 Strategy

- Courses on equipment maintenance at the regional and country level.

9. INFRASTRUCTURE AND APPROPRIATE TECHNOLOGY DEVELOPMENT

9.1 Infrastructure

9.1.1 Objective

- To provide universal access to services for the preservation of vision and restoration of sight.

9.1.2 Strategies

- Assessment to determine current infrastructure, capacity and level of utilization.
- Establish the productivity norms for key resources (for example cataract surgeries per ophthalmologist per year).
- Obtaining long term sustainability through the introduction of users fees where possible. The revenues should be utilize for improvements and development of the eye care services.
- Operations research to determine how to increase the productivity of the available infrastructure and improving all the administrative process and technological development.
- Promote the utilization of the private sector infrastructure for the development of services for the poor population.

9.1.3 Indicators

- Ratio of ophthalmologists, ophthalmic assistants and other personnel to population
- Proportion of district eye units with personnel and facilities.

- Cataract surgical rate(cataract operationsmillion population year).
- Spectacles dispensed per million population.

9.2 Technology

In some countries exist, shortages of usable diagnostic and therapeutic equipment necessary for practitioners to apply modern, but fundamental techniques in eye care delivery. Often countries do not have the necessary information on appropriate technology, leaving users with sophisticated equipment which is too expensive to operate, maintain and repair.

9.2.1 Objectives

- Provide practitioners, hospitals and clinics with information on good quality and affordable appropriate technology.
- To ensure availability of spectacles, ophthalmic supplies and equipment at costs appropriate to local economies.
- To provide training to doctors and technical support staff in maintaining and repairing their own ophthalmic equipment.

To introduce new technologies such as computers and computer networks to improve management efficiency and information exchange.

¹ The Generalities was elaborated by Dr. B. Thylefors Director, Programme for the WHO Prevention of Blindness and Deafness.

² This document was elaborated with the technical input of the Prevention of Childhood Blindness Committee composed by Dr. Allen Foster and Clare Gilbert of the International Centre for Eye Health, London, U.K.; Mr. David Taylor of the Great Ormond Street Hospital, London, U.K.; and the OSWI Eye Care Policy Committee (Mr. D.C. Gibbons, Dr. H.M. Shillingford - Rickets, Dr. Deo Singh, Dr. Hugh Vaughan and Victor Wiedijk).

³ This document was developed with the technical co-operation of Dr. Cristina Leske, M.D., M.P.H., Dr. Carl Kupfer and the OSWI Eye Care Policy Committee (Mr. D.C. Gibbons, Dr. H.M. Shillingford - Rickets, Dr. Deo Singh, Dr. Hugh Vaughan and Victor Wiedijk).

⁴ This document was elaborated with the technical support of

GLADAOF - Retina Group of the Pan American Association of Ophthalmology and the OSWI Eye Care Policy Committee (Mr. D.C. Gibbons, Dr. H.M. Shillingford - Rickets, Dr. Deo Singh, Dr. Hugh Vaughan and Victor Wiedijk).

This document was elaborated with the technical advice of Dr. Allen Foster from the United Kingdom, Dr. Dr. Crisatina Leske from USA, Dr. Juan Batlee from Dominican Republic, Dr. Rainald Duerksen from Paraguay and the OSWI Eye Care Policy Committee (Mr. D.C. Gibbons, Dr. H.M. Shillingford - Rickets, Dr. Deo Singh, Dr. Hugh Vaughan and Victor Wiedijk).

⁶ This document was elaborated with the technical cooperation of Elvira Martin from ONCE, Janet Silver and Clare Gilbert from the Moorfields Eye Hospital, U.K., Bruce Rosental, Karen Siedman and Mary Ann Lang from the Light House, N.Y. USA; and the OSWI Eye Care Policy Committee (Mr. D.C. Gibbons, Dr. H.M. Shillingford - Rickets, Dr. Deo Singh, Dr. Hugh Vaughan and Victor Wiedijk).

⁷ Document elaborated with the technical cooperation of Barbara Underwood, Advisor in Nutrition to WHO and the OSWI Eye Care Policy Committee (Mr. D.C. Gibbons, Dr. H.M. Shillingford - Rickets, Dr. Deo Singh, Dr. Hugh Vaughan and Victor Wiedijk).

⁸ Document elaborated with the technical co-operation the NGO Task Force to WHO and the OSWI Eye Care Policy Committee (Mr. D.C. Gibbons, Dr. H.M. Shillingford - Rickets, Dr. Deo Singh, Drs. Hugh Vaughan and Victor Wiedijk).

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