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REPORT OF THE ELEVENTH MEETING

OF THE WHO PROGRAMME ADVISORY GROUP

ON THE PREVENTION OF BLINDNESS

New Delhi, 28 February - 3 March 1995

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INTRODUCTION

The Eleventh Meeting of the WHO Programme Advisory Group on the Prevention of Blindness (PAG) was held in the Regional Office for South-East Asia (SEARO), New Delhi, from 28 February to 3 March 1995.

The meeting was attended by nine members of the Programme Advisory Group, representatives from the World Bank, several nongovernmental organizations, the Directors of four WHO Collaborating Centres, and members of the Secretariat.

The list of participants is in Annex 1.

Dr B. Thylefors, Programme Manager, Programme for the Prevention of Blindness (PBL), welcomed the participants and thanked the Regional Director SEARO for hosting this meeting. This was the second time that the PAG meeting was being held in SEARO, the last occasion being in 1981.

Dr Thylefors also extended a warm welcome to the nongovernmental organizations (NGOs). He referred to the special mention that the Director-General had made of the PBL Programme and NGO collaboration in his opening speech to the Executive Board, in January 1995.

In briefing the PAG members, Dr Thylefors stated that the PAG was established in 1979. Its mandate was as follows:

1. To advise the Director-General on programme development.
2. To review and evaluate programme activities.
3. To play a promotional and advocacy role.

He urged the need for PAG members to focus on areas of particular importance and future action, including possible disease control targets and research.

The meeting was opened by Dr Uton Muchtar Rafei, Director, WHO Regional Office for South-East Asia. In his opening speech, the Regional Director referred to the progress that the Programme had made in most countries of the Region. He urged enhanced participation of the nongovernmental organizations and commented on the initiative taken by the Government of India to obtain support from the World Bank for prevention of blindness.

The full text of the Regional Director's speech is in Annex 2.

The draft agenda was adopted with no amendment (Annex 3).

Professor G.J. Johnson was nominated as Chairman and Professor M.D. Khan as Vice-Chairman. Professor A. Abiose and Dr J. Fernando served as Rapporteurs.

1. REVIEW OF THE PREVENTION OF BLINDNESS PROGRAMME DEVELOPMENT

1.1 ACTIVITIES AT THE GLOBAL LEVEL. GENERAL OVERVIEW

The general developments of the WHO Programme for the Prevention of Blindness (PBL) had been quite positive during the past two years. Despite decreasing regular budgetary funding, programme activities had expanded in several fields, as was noted in the Tenth Meeting of the WHO Programme Advisory Group, held in Geneva in March 1993. There were presently some 108 countries that had a national plan, committee, or operational programme for the prevention of blindness, out of the estimated 116 Member States in need of such action.

The Programme had developed a number of very significant activities, in particular:

- applied research on cataract, with regard to outpatient surgery in Africa, and quality-of-life implications of cataract surgery in India;
- a scheme of recommended standards for intraocular lenses manufactured by collaborating organizations or institutions on a non-profit basis (see "Documentation");
- a series of manuals on the assessment and management of trachoma, in collaboration with The Edna McConnell Clark Foundation;
- rapidly increasing control programmes against onchocerciasis in Africa, in collaboration with a consortium of NGOs and the World Bank;
- a revision and new documents/publications on global blindness trends and specific data available on a country basis (see "Documentation").

The Eighth General Programme of Work of WHO ran to the end of 1995 and there was thus a good possibility that the PBL Programme would meet its target in terms of global coverage. However, there was a precarious budgetary situation, with decreasing resources being spread very thinly. The Ninth General Programme of Work of WHO did not contain a specific PBL component, but a broader label of "Disability Prevention and Rehabilitation" which included blindness (PBL) and deafness (PDH) prevention.

The PDH Programme would continue to be administered by the PBL staff until further notice. As the PDH component had no staff positions and an extremely limited regular budget (US\$ 50 000 for two years), there was an urgent need to find extrabudgetary resources for that Programme if it were to retain its separate identity. On the positive side, it should be noted that the WHO Executive Board approved on 25 January 1995 a resolution on "The prevention of hearing impairment". This resolution would be forwarded to the World Health Assembly in May 1995; it would increase the possibilities for future funds for the PDH Programme.

The political recognition of the importance of blindness prevention was a matter of concern. Ocular morbidity, much of it preventable or curable, contributed significantly to the global burden of avoidable disability, but this was not given sufficient political visibility.

Understandably, there were competing demands for limited resources from programmes that aimed to control newly emerged diseases, such as AIDS, and the resurgence of old diseases, such as malaria and tuberculosis. However, the magnitude of the problem of blindness, given the demographic changes globally and especially in the developing countries, should not be underestimated. Moreover, in terms of cost-effectiveness, interventions against blindness came up top. The dwindling resources for the Programme posed severe difficulties in supporting regions and countries in their prevention of blindness efforts. This was compounded by the absence of core PBL personnel in nearly all regions.

Discussion

The need to enhance the visibility of the Prevention of Blindness Programme was stressed. Every avenue and opportunity should be availed of to impress on governments and policy-makers the cost of needless blindness and the cost-effectiveness of interventions to prevent and cure blindness. Information packages could be prepared to communicate with governments. The International Federation of Ophthalmological Societies (IFOS), the International Agency for the Prevention of Blindness (IAPB) and NGOs could play an important advocacy role through their constituent members and societies.

In discussing emerging priorities, the increasing problem of diabetic retinopathy was highlighted. This condition lent itself to early effective treatment to prevent blindness. That, coupled with a health education package for the diabetic patient, could be a useful initiative for the PBL Programme.

Corneal blindness was a continuing problem - both the large backlog of cases requiring keratoplasty with all its attended limitations, and the prevention of new corneal infections. International NGOs and other interested organizations were contributing technical and financial resources toward the establishment of eye banks. Those efforts should be supported.

WHO could assist interested Member countries through establishing criteria and policies for eye banking, particularly in the context of HIV infection.

Low vision care was becoming increasingly important, with the ocular problem in the aging population. The need for low-cost low vision aids was stressed. It was noted that the PBL Programme was presently preparing a low vision kit for screening and assessment, in collaboration with the University of Melbourne.

1.2 ACTIVITIES AT THE REGIONAL LEVEL

1.2.1 African Region

Introduction

The objective of the WHO/AFRO Programme for the Prevention of Blindness was to promote national programmes for the prevention and control of blindness in order to reduce the prevalence of blindness to less than 0.5%; to prevent the avoidable blindness; and to provide essential primary eye care for all. The dissemination of information, the promotion of manpower development for blindness prevention and epidemiological research were emphasized.

Most of the PBL activities were budgeted under primary health care and nutrition. Sizable assistance to PBL country programmes came from bilateral, multilateral and nongovernmental organizations.

Situation analysis

The average prevalence of blindness in sub-Saharan Africa was 1.2%, varying from 0.3% in Congo to 1.3% in some parts of Mali. The major cause of blindness in the Region was cataract (43.6%), followed by trachoma (19.4%); all other causes formed 25.0%, with ocular trauma, infections such as measles and vitamin A deficiency standing out. The low vision range lay between 1.4% and 3.6%. Out of an estimated population of 510 300 000 in sub-Saharan Africa, 7 100 000 were blind. The share of sub-Saharan Africa of the global population was 9.7%, but her share of global blindness burden was 18.8%.

Human resources for PBL were very modest and were localized in urban centres. The estimated average rate of ophthalmologists in the Region was still one per million of the population.

Main activities

(i) In February 1993, a workshop was held in Nairobi on the epidemiology of trachoma for the English-speaking countries. This workshop was supported by The Edna McConnell Clark Foundation.

In October 1993, a workshop was held in Maputo to assess the needs in terms of developing prevention of blindness activities and to identify resources and plan the activities. Emphasis was laid on identifying priority needs to combat the major blinding conditions in countries, in harmony with the available material, human resources and health care infrastructure, for Angola, Cape Verde, Equatorial Guinea, Guinea-Bissau, Mozambique and Sao Tome and Principe.

A workshop was held in Lagos in September 1994 to evaluate the efforts made by some Member States in developing manpower for PBL since 1988. The countries evaluated were Gambia, Ghana, Liberia, Nigeria and Sierra Leone. There had been marked improvement in human resources for PBL in these countries since 1988.

(ii) The Institute of Tropical Ophthalmology (IOTA) at Bamako, Mali, was redesignated in 1993 for a further four years as a WHO Collaborating Centre for PBL.

The National Eye Centre at Kaduna, Nigeria, was designated as a WHO Collaborating Centre for PBL for four years, from August 1993.

The Eye Department at Kamuzu Central Hospital, Lilongwe, Malawi, was designated in December 1994 as a WHO Collaborating Centre for PBL for the Southern African Development Community (SADC).

(iii) The need for a Regional Adviser for the Prevention of Blindness in the African Region was recognized as a priority at the Tenth Meeting in 1993. Unfortunately, lack of funds had not allowed implementation.

- (iv) Educational materials (posters, books, documentation and slides) were distributed to institutions and individuals in the Region.
- (v) Madagascar held a national seminar in November 1994 to initiate a PBL programme.
- (vi) The Lions SightFirst Programme granted US\$ 46 868 to Cameroon, to develop a public education programme on onchocerciasis.

SightFirst funded the construction and equipping of the new Eye Department at Kamuzu Central Hospital, Lilongwe, Malawi. This was a training centre for ophthalmic personnel serving Southern Africa.

SightFirst also granted US\$ 1 224 264 for the expansion of IOTA, Bamako, to enable the training, annually, of three ophthalmologists, four cataract surgeons, 24 ophthalmic nurses and nine eyeglass technicians.

Conclusion

PBL activities in Africa in 1993 and 1994 were encouraging, despite the negative economic environment. Nineteen countries had active national PBL committees. Eight countries had inactive national PBL committees. One country was in the process of forming a national committee for PBL. Eighteen countries still did not have national committees for PBL.

The onchocerciasis programme in West Africa was a great success. Some countries in West Africa (Nigeria), Central Africa (Congo, Cameroon), East Africa (Tanzania, Uganda) and Southern Africa (Malawi) had initiated ivermectin distribution to control onchocerciasis.

Education on trachoma was needed, together with better access to water. Ocular injuries, particular to the cornea, also required an educational prevention campaign.

Cataract, which was the main blinding disorder, presented a great challenge to the resources available. It was estimated that there were 3 100 000 cases of cataract in sub-Saharan Africa. As the population aged, more cases of cataract were added to the backlog. The training of paramedical personnel to perform cataract surgery would have to be expanded rapidly to cope with the load.

Eight countries had been identified which would need special attention before national committees for PBL and PBL programmes were started.

Eritrea and South Africa joined WHO in 1995. For Eritrea, a fresh start at PBL was needed. Identification and training of personnel for PBL was a priority. A rapid survey for blindness in Eritrea was essential. South Africa would undoubtedly open to other Member States her training facilities for ophthalmologists.

1.2.2 Region of the Americas

Introduction

With the sponsorship of Sight Savers International and the Organizacion Nacional de Ciegos de España (ONCE), the Pan American Health Organization Program on Eye Care initiated its activities in 1991. The Program had provided support to Member countries for the development of programmes of eye care and prevention of blindness, as part of the strengthening of the local health services through primary eye care. PAHO's regional programme had joined the endeavour of the Pan American Association of Ophthalmology (PAAO), the Ophthalmological Society of West Indies (OSWI), IAPB and numerous international, subregional and indigenous NGOs to develop an integrated eye care and blindness prevention regional programme that was in a permanent process of adjustment to all the political, social and economic changes in the Region.

Situation analysis

During the last decade, numerous programmes had been implemented within the ministries of health and public institutions. By the end of that period, the governments had lost their capacity to finance and provide eye care services and started to implement the privatization policies of the health delivery systems.

Whatever the proportions of public and private involvement in the financing and provision of health services, the public sector had special responsibilities such as regulations controlling prices, quantity, distribution and quality, and preventive and health promotion activities. This would enable full and effective coordination of efforts at the national level and constant monitoring of progress in the achievement of the goals of the national PBL plan.

Activities 1993-1994

The activities reflected the three main objectives of the Program:

1. To assist countries to identify and motivate private and governmental leading institutions to develop eye care programmes.
2. To develop eye care policies and plans.
3. To implement appropriate management and administration in the national programmes.

Identify/motivate national institutions

These activities had been organized in order to increase the number of eye care projects within the national programmes of prevention of blindness, motivating new providers and people already working in eye care:

- Organization of the annual joint meeting of the Pan American Association of Ophthalmology and the Pan American Health Organization.
- Participation in the organization of the subregional workshops for the English-speaking Caribbean.

- Organization of the workshop on prevention of blindness during the Pan American Congress of Ophthalmology.
- Cooperation in the organization of the Latin American Regional Workshop during the IAPB Fifth General Assembly (May 1994).
- PAHO/CCB involved OSWI in the development of the subregional workshops and promoted eye care among its members.

Development of eye care policies and plans

The purpose of this group of activities was to increase the know-how to implement a programme or to formulate an eye care policy.

At the regional level:

Organization of seminars, workshops and courses

- Low Vision Care Seminar (WHO/PAHO)
- Ophthalmic assistant training programme (PAAO/JCAHPO/PAHO)
- Community ophthalmology courses once a year (CBM/PAHO/FOS)
- Training programme in equipment maintenance for Central American technicians (PAHO/ORBIS)
- Residency and subspecialties programme in ophthalmology for the English-speaking Caribbean (IPO/PAHO)

Production and distribution of manuals

- Distribution of the manual "Evaluación oftalmológica de la oncocercosis en las Americas"
- Production of the manual "Eye care for the workers" (In press)

Development of eye care policy guidelines to be included by governments in the national health policy. The following components of the guidelines for development of policies had been completed:

- "Guide to regulate and/amend Pan American laws on ocular tissue transplantations" (PAHO/APABO/PAAO)
- "Low vision care in Latin America and the Caribbean: A regional strategy"
- Other components to be concluded during 1995

Implement appropriate management

Some strategies had been implemented to develop self-sustainable programmes.

At the regional level:

Reducing investment and recurrent costs

- Identification of a package of good-quality, low-priced equipment and materials (IOLs, sutures, frames and lenses, etc.). PAHO was currently promoting Aurolab IOLs.
- Local production of eye drops. Two feasibility studies were currently ongoing (Caribbean, Latin America).
- Local production of low-cost spectacles. Belize initiated the local production of spectacles; a second laboratory was developed in Colombia and proved to be successful during 1994. This alternative was then offered to Bolivia and Dominica.

Cost recovery

- PAHO was promoting a fee for services according to the socioeconomic scale that existed in most countries.
- PAHO was promoting local fund-raising programmes.

Cuba

During 1994, PAHO organized several teams of experts in different fields - toxicology, virology, nutrition, epidemiology, neurophthalmology and others - to help the Cuban Government to manage the epidemic of neuropathy; approximately 50% of cases in this vast epidemic, with a total of some 52 000 cases, had had signs of optic neuropathy.

1.2.3 Eastern Mediterranean Region

Blindness and eye disorders represented a problem of major public health concern in many countries of the Region and it was generally estimated that there were over 10 million people with varying degrees of blindness. Of those, the majority were cases of avoidable blindness. The major causes of blindness encountered in the Region were cataract, trachoma, glaucoma, corneal opacities, refractive errors and xerophthalmia.

With the decline in trachoma and other communicable eye diseases, improved socioeconomic standards and increased life expectancy, cataract was emerging as the leading cause for concern in many countries. The available health care services were overwhelmed in many cases by the increasing demand for treatment.

Despite the overall improvement, trachoma was still considered an important cause of morbidity and visual impairment in several countries in the Region.

Xerophthalmia and keratomalacia due to vitamin A deficiency had been reported in significant proportions in some countries. Onchocerciasis was highly prevalent in southern

Sudan and in small communities in the Republic of Yemen. Glaucoma was encountered increasingly in recent years in some Member States.

The main objectives of the regional programme were to assess the magnitude of the problem and to promote the development of national prevention of blindness activities based on primary health care.

During the last biennium, the WHO Regional Office for the Eastern Mediterranean had focused efforts on promoting national strategies for the prevention of blindness and on strengthening the development of national programmes.

During 1993/1994, WHO collaborated with Member States in planning and implementing national programmes on the prevention of blindness, with special emphasis given to the development of primary eye care services. To monitor progress of prevention of blindness activities, WHO organized in Cairo, in April 1993, an intercountry meeting for evaluating national programmes. These programmes were reviewed, and constraints and achievements identified. Overall, there had been a positive development of national programmes, with increasing implementation of eye care as part of PHC and a general strengthening of human resources and infrastructure at all levels. Furthermore, some countries had been able to demonstrate significant reductions in eye diseases and blindness. Resource constraints and weaknesses in monitoring and evaluation schemes in many national programmes were, however, still to be overcome. Recommendations to strengthen activities and promote collaboration with Member countries were made. Special emphasis was to be placed on ensuring adequate support and appropriate allocation of resources.

Both short- and long-term training courses and workshops for training the various categories of health personnel in primary eye care had been conducted in many countries. National courses for training primary health care physicians in eye care were sponsored. WHO also supported training of technicians in Pakistan by sponsoring the ophthalmic technicians courses.

Efforts to strengthen national capabilities in public health and community ophthalmology continued in 1993. WHO fellowships had been awarded for the training of the staff of the national programme and also for establishing the specialty of community ophthalmology. Other training fellowships in other aspects of prevention of blindness were awarded to programmes in other countries.

WHO collaborative programmes had also responded to the need to improve and update epidemiological assessment of ocular morbidity and blindness. Intensive cooperation and support had been provided to the planning and implementation of national surveys and data collection activities, particularly in Morocco and Tunisia.

Collaboration was maintained with international agencies and organizations interested in the prevention of blindness. WHO participated actively in the regional meeting on prevention of blindness organized by IAPB in Bahrain, in November 1993.

At the regional level, emphasis had been given to strengthening of information exchange and dissemination, and support to WHO collaborating centres and other centres of excellence in the Region.

The First Meeting of the Regional Advisory Panel on the Prevention of Blindness would take place in 1995.

1.2.4 European Region

In the European Region, emphasis had been on looking more at the issues of disability and rehabilitation rather than at prevention of blindness.

There was emerging interest in developing and strengthening of eye care services in some of the Central and Eastern European countries, as evidenced by WHO staff visits to Romania and Hungary. A proposed visit to the Baltic States had not materialized till now. There was a great need for data on visual impairment. There was also an emerging NGO interest in working in those countries where suitable partners could be identified. Areas that required attention were upgrading of skills of the large cadre of existing fully and partially trained ophthalmologists, the provision of needed supplies and equipment, and management training. The development of training facilities by strengthening existing institutions could be considered, with support from NGOs and service organizations.

1.2.5 South-East Asia Region

Magnitude of the problem

The South-East Asia Region of WHO was one of the major contributors to worldwide blindness. The prevalence of blindness in the countries of the Region ranged between 0.5 and 2.0%. In India alone, the number of blind persons accounted for 5.10 million. The causative factors of blindness might differ from country to country, but cataract, refractive errors, trachoma, eye injury, glaucoma and nutritional deficiency were the major causes.

Facilities and human resources for eye care services were inadequate in most of the countries. There was an absolute shortage of trained professionals, ophthalmologists, ophthalmic assistants and nurses, who were concentrated mostly in urban areas, whereas health workers at PHC level were poor on eye care knowledge, skills and supplies.

Objectives of the PBL Programme in the Region

The Regional Programme of Prevention of Blindness aimed at the prevention and control of major causes of blindness through preventive and curative measures, based on epidemiological analysis of the blindness situation in the Region. To achieve this objective, concerted continued efforts were made to develop and/or further to strengthen national programmes for prevention and control of the leading avoidable causes of visual impairment and disabilities, with the aim that all the countries in the Region had national programmes and eye care services which were available to the whole population of the countries. While WHO supported the efforts for strengthening of professional capabilities in countries, the collaborative activities were mainly focused on community-based approaches for delivery of essential primary eye care at grass-root level, including outreach services. The importance of community involvement, social mobilization and intersectoral approaches was also emphasized.

Activities during the past two years

Prevention of blindness programmes had been well established in six countries of the Region. Appreciable efforts had been made for strengthening community-oriented activities, along with professional and nongovernmental organizations, to supplement the outreach services, particularly for underserved sections of the population in the countries.

In Bangladesh, support was provided for training of Thana(subdistrict)-level doctors and nurses in primary eye care. Essential equipment and literature were also provided. In India, a launching workshop for a massive World Bank-funded project for clearing the huge cataract backlog in seven project States of the country was organized in October 1994. WHO provided technical support to this by active participation right from the beginning of the project formulation, pre-appraisal and appraisal missions of the project. With WHO's support, district blindness control societies (DBCS) had been established, and guidelines produced for the DBCS and training modules. Many workshops for programme review, evaluation, project formulation and technical training for different categories of health personnel were also supported.

The World Bank-supported Cataract Control Project in India

The objective was to reduce the cataract backlog in seven States with the highest prevalence of blindness. The project duration would be seven years.

The technical goals of the programme were threefold:

1. To increase sight restoration operations for cataract blindness.
2. To strengthen infrastructure with minimal new construction.
3. To train ophthalmic personnel in both intracapsular cataract surgery (ICCE) and extracapsular cataract surgery with intraocular lens (ECCE-IOL).

With respect to increasing sight restoration operations, the goal was an additional 11 million operations over seven years along with the current level of surgery. A goal of 700 operations per surgeon per year along with the appropriate choice of ICCE or ECCE-IOL, depending upon the patient, should be reached by providing adequate equipment.

Infrastructure would be strengthened depending upon the need to overcome barriers to increasing surgery, such as availability of operating theatres, bed facilities and the provision of clean and well-maintained patient areas.

Training of personnel would begin with four centres training the trainers, who would return to the medical schools and train, in their turn, their colleagues and ophthalmic personnel from district hospitals.

Evaluation would focus on beneficiary assessment (patient satisfaction), a mix of government, NGO and private activities, reaching the poorest of the poor, tribal, underserved and women, and the development of programmes that would eventually become financially self-sufficient.

In discussing modalities for World Bank support, it was explained that the initial contacts would need to come from the government concerned. An analysis of the health sector in the country by the World Bank should indicate that tackling avoidable blindness made sense from a developmental point of view.

In Indonesia, surveys on ophthalmic diseases and hearing impairment were under way in South Sumatra, Central Java and South Sulawesi provinces, as part of the national survey. A workshop on strengthening comprehensive cataract relief services was held in the Community Eye Care Institution during June 1993. Several nationals were awarded WHO fellowships for incountry and abroad training on public health, computer courses and comparative study on cataract relief services. The participation of nationals in international conferences on prevention of blindness was also supported.

In Nepal, emphasis was placed on clearing the backlog of cataract blindness, through organizing mobile eye camps and outreach services to the rural population. The training of ophthalmic assistants and health assistants in charge of health posts, as well as schoolteachers in primary eye care, was organized in a planned manner. Two eye care centres, viz. Himalaya Eye Hospital in Pokhara and Tilaganga Eye Centre in Gausala, were opened, which strengthened the national capability for referral services, training, and production of necessary materials and supplies. An evaluation exercise on the Nepal Prevention of Blindness Programme was under way.

In Myanmar, support was provided for training in micro and laser surgery, intraocular lens implantation and management of glaucoma. A model primary eye care project in Sintgaing, with components for training of community health workers and PHC workers, medical officers and ophthalmologists, as well as the needs assessment, information system and operation facilities, was being supported.

In Sri Lanka, a meeting on the national plan for prevention of blindness and visual impairment and primary eye care was organized, to review the programme and the resources to fulfil the target of the national plan. Training courses on primary eye care were organized for PHC workers. Several ophthalmologists were awarded WHO fellowships in the field of primary eye care, ophthalmic laser surgery and teaching methods in ophthalmology. It was noted that, out of 22 010 ophthalmic extractions performed in 1993, only 50% were implanted with an IOL, due to lack of materials. The shortage of low-cost spectacles was also reported.

Trends and future activities

- (i) Cataract occupied 80% of whole blindness, as in the case of India. With the growing number of the elderly population, senile cataract, as well as diabetic retinopathy, etc., would be increasing. The backlog of cataract blindness was ever accumulating in a few countries, although all-round efforts were made. Mobile eye camps and outreach service approaches would have to be further stepped up to wipe out that huge backlog.
- (ii) Trachoma and other infectious eye diseases were gradually decreasing, but remained endemic in some pockets of certain countries. On the other hand, eye injuries were becoming increasingly a public health concern, necessitating the strengthening of awareness activities, protective measures and referral support. Vitamin A deficiency had gone down in some countries, with the improved food intake. However, the cases might relapse in connection with non-breastfeeding and improper weaning food for children among working women, as was the case in Thailand. Close surveillance and coordinated activities with other programmes, such as Nutrition and Health Education, needed to be pursued.
- (iii) There were absolute shortages of trained manpower to provide specialized services, outreach and mobile camp surgeries, and primary eye care. While the training of ophthalmologists would have to receive continuous support, primary health workers, including health assistants working at health post level, as well as health volunteers and schoolteachers, should receive training on community-based primary eye care.
- (iv) Qualitative aspects of eye camp activities would have to be sufficiently addressed through relevant measures such as the establishment of uniform standards for case management, improved supervision, and support from professionals. Increased involvement of local officials and communities and active participation of local health workers in outreach eye camps would have to be pursued for effectiveness, sustainability and follow-up of such programmes.
- (v) Nongovernmental organizations played a significant role in the national blindness control programmes. In India, 65-70% of blindness control work was done by NGOs. In 1992, out of 1.4 million cataract surgeries performed in the country, 800 000 were done by NGOs. Strengthened efforts would have to be made for improved coordination and support to NGOs engaged in this programme.
- (vi) There had been positive developments in domestic production of eye care materials such as low-cost spectacles, contact lenses, IOLs, etc. However, funds for provision of raw materials for such domestic production were in great shortage in many countries. The integration of the PBL Programme into Disease Prevention and Control in the next biennium might result in reduced budgetary allocations to those particular programmes in countries. With those, extrabudgetary sources would have to be explored actively.

1.2.6 Western Pacific Region

The objective of the programme on prevention of blindness in the Western Pacific Region was to reduce avoidable and curable blindness, promote eye health and make adequate eye care available to all, especially underserved rural and urban communities.

The programme aimed to reduce the national average of blindness rates to less than 0.5%, with no more than 1% in any part of the country.

Principal past achievements

- (i) Support was provided for printing the "Primary eye care manual" for the Prevention of Blindness Programme in the Philippines.
- (ii) An intercountry workshop on training mid-level personnel on blindness prevention was held in Utsunomiya, Japan, from 27 September to 1 October 1993. The objective of the workshop was to review and discuss the training programme on eye care for mid-level personnel. The workshop recommended the identification of mid-level workers, their appropriate tasks, training and core curriculum.
- (iii) In China, support was provided for a national workshop on eye care for the elderly, which was held in October 1993.
- (iv) WHO support was provided for the national survey of blindness and poor vision among schoolchildren in Malaysia, in December 1993.
- (v) In Lao People's Democratic Republic, support was provided for a national conference for mass cataract intervention, which was held in January 1994.
- (vi) In 1994, ophthalmoscopes were provided to China, Lao People's Democratic Republic, Malaysia, Papua New Guinea, Philippines, South Pacific and Viet Nam to accelerate their screening activities, especially in the national cataract backlog activities.
- (vii) In January 1995, a consultant visited Cambodia to collaborate in the assessment of the blindness situation, to develop a national programme on prevention of blindness, and to train selected eye care personnel in the delivery of essential eye care services.

Future plans

At country level, collaboration would focus on establishing and expanding primary eye and ear care services that were integrated into the general health services. Support would be provided for technical and management training for ear/eye care workers and the establishment of primary ear/eye care services in some countries. WHO would also promote the expansion or establishment of primary eye care and hearing services, facilitate the training of mid-level ear/eye care personnel and provide technical backup in training and programme development.

A working group on training mid-level eye care personnel on prevention of blindness would be held in Manila, Philippines, in July 1995. The objectives of the meeting were (1) to review the policies and strategies in the training of the appropriate category of eye care personnel, which would ensure effective delivery of eye care especially in developing countries, and (2) to recommend future directions of the regional programme, in particular the curriculum for training of mid-level eye care personnel, and collaboration with Member States and nongovernmental organizations in the implementation of the regional programme on prevention of blindness.

Consultant and local cost support would be provided to countries in the South Pacific. The main objectives were to assess the national programme on blindness prevention, to identify issues and constraints on the implementation of this programme, and to formulate strategies to strengthen this programme.

Local cost support would be provided to Cambodia for national training of eye care personnel in cataract surgery.

Evaluation

The programme had achieved the targets set in almost all countries of the Region, and the backlog of cataract blindness had been considerably reduced in all countries of the Region.

The future direction of the programme on blindness prevention would concentrate on low vision and early detection of preventable blindness and further extension of eye care services.

1.2.7 Discussion

Overall, the development in the WHO regions was progressing well.

The importance of staff support, especially in the African Region as well as in the Eastern Mediterranean Region, was stressed.

Development in the Latin American region, where a large number of ophthalmologists were available, would depend on providing accessible and affordable care to indigent populations. Subsequent to the efforts of WHO, IAPB and a number of NGOs and international service organizations, there had been an increased awareness among ophthalmologists to become involved in community-based programmes.

Training in community ophthalmology was identified as an area that required attention. Centres in the Eastern Mediterranean Region (Peshawar, Pakistan) and the African Region (Kaduna, Nigeria) had been started, but they would require inputs in curriculum development, training of trainers and, perhaps, visiting faculty till they are on a firm footing. The forthcoming course in public health ophthalmology and eye health management in Korat, Thailand, would serve a great need for programmes in that part of the world.

2. OVERVIEW OF PROGRAMME DOCUMENTATION

The following documentation was produced and distributed:

Following the meeting held in Bangkok in July 1992, hosted by the International Council for Education of the Visually Handicapped, the report on "Management of low vision in children" had been issued as WHO/PBL/93.27.

The report on the Tenth Meeting of the WHO Programme Advisory Group on the Prevention of Blindness (WHO/PBL/93.30) gave a comprehensive overview of the PBL Programme and its status in 1993.

A booklet and slide series on "The child, measles and the eye" had been issued in collaboration with the Expanded Programme on Immunization (WHO/EPI/TRAM/93.5 - WHO/PBL/93.31)

The reports of the meetings of the Nongovernmental Development Organizations Coordination Group for Ivermectin Distribution had been issued as follows:

- Second Meeting, Geneva, 1-3 June 1993 - WHO/PBL/93.32
- Third Meeting, Washington, D.C., 14-16 December 1993 - WHO/PBL/94.37
- Fourth Meeting, Geneva, 6-8 July 1994 - WHO/PBL/94.41
- Fifth Meeting, Washington, D.C., 2-3 November 1994 - WHO/PBL/94.45

A series of manuals on trachoma control was being prepared with support from The Edna McConnell Clark Foundation. The first manual, "Trichiasis surgery for trachoma - The bilamellar tarsal rotation procedure", was issued in 1993 as document WHO/PBL/93.29. A revised version of the booklet on "Primary health care level management of trachoma" with a slide series had become available as WHO/PBL/93.33. A third manual, "Community control of trachoma", was in the pipeline (WHO/PBL/93.36). Other material, including two videos and a brochure, had been developed by The Edna McConnell Clark Foundation, which was also providing funds to the WHO Programme for the production and dissemination of all trachoma-related material mentioned above.

The Data Bank on Blindness in the WHO/PBL Programme had been updated and computerized, with a thorough revision of global epidemiological data. That had been the basis for the development of two documents:

- "Available data on blindness" (WHO/PBL/94.38), including maps and details of epidemiological assessments of blindness in countries.
- "Global data on Blindness - An update" (WHO/PBL/94.40), also published in the *Bulletin of the World Health Organization*, 73(1), 115-121, 1995. This document gave the global trends and estimates for blindness and low vision.

The report of the Meeting on the Effects of Solar UV Radiation on the Eye had been issued as WHO/PBL/EHG/94.1. The subsequent meeting for research planning on this resulted in the document "Report of the Informal Consultation for Research Developments on Solar UV-Radiation and Cataractogenesis" (WHO/PBL/94.43).

Work had been ongoing throughout 1994 for an updated version of the publication "Strategies for blindness prevention in national programmes". This publication was sold out and had been much in demand. The new version would include several new developments such as simplified trachoma assessment, ivermectin against onchocerciasis, intraocular lens implantation issues, and two new sections on diabetic retinopathy and on childhood blindness. The revised version had been submitted to the WHO Publications Committee for approval for printing.

The Group commended the Programme and the valuable documentation produced and urged its wide distribution. Members also suggested that the PAG meeting reports be also disseminated widely after clearance in-house, as necessary.

3. ASSESSMENT OF NATIONAL PROGRAMME DEVELOPMENTS

The Group received and updated the tables giving the status of national blindness plans and programmes, included as Annex 4 in the report of the Tenth PAG Meeting. The updated tables were in Annex 4 of the present report.

It was noted that the programmes were in various stages of development and members and collaborating NGOs could promote strengthening of national programmes in countries of the region(s) they knew best.

4. ONGOING AND PLANNED RESEARCH

In discussing ongoing research, the members took note of the ongoing technical support provided to countries in epidemiological studies on blindness prevalence. Recent studies had provided valuable population-based data, which had been used in the recent update of global blindness data.

Efforts were under way to develop tools for evaluation of specific aspects of national programmes. These would be field-tested in a few countries which had had a blindness prevention programme in place for some years. Nepal had been chosen as the first country for such an evaluation, to be followed by other countries - in Africa and the Eastern Mediterranean.

Other research activities had focused on preparing protocols and instruments for measuring outcomes of intervention in terms of quality of life and patient satisfaction.

The Group endorsed those research studies and felt that, once they were validated, they could be applied in national programmes.

In addition to those ongoing research studies, members listed the following programme delivery topics which could be the subject of operations research:

- (1) Management strategies which maximized the impact of major programme inputs: equipment, supplies, personnel.
- (2) Most effective use of non-ophthalmologists in reaching the blind and those at risk.
- (3) Key factors in programme sustainability.
- (4) Models for integration of eye care services into ongoing health services.
- (5) Systematic assessment of cost of care (e.g. cataract surgery) and how to reduce it to the lowest possible unit cost.
- (6) Role of quality of life and patient satisfaction in increasing service volume and contributing toward financial self-reliance.

- (7) Methods to assure coverage of disenfranchised groups.

Some of those topics were not classical research topics, but lent themselves to case studies or other descriptive analysis.

Examination of service delivery methods was an important counterpart to disease-specific research and ensured the maximization of public health benefit.

5. ACTIVITIES OF WHO COLLABORATING CENTRES FOR THE PREVENTION OF BLINDNESS

The reports of the collaborating centres were tabled.

The 21 WHO collaborating centres for the prevention of blindness were in different stages of development and their activities varied.

The Group reiterated the desirability of a meeting of collaborating centres to be convened to provide an opportunity for exchange of information on their respective areas of interest. That would provide the basis for collaborative activities between centres and a general networking among the centres in a way that would support the WHO/PBL Programme. Given that collaborating centres had specific priority activities, a range of topics such as major research issues and training of various levels of personnel could be included on the agenda.

6. COLLABORATION WITH NONGOVERNMENTAL ORGANIZATIONS

The highlights of the collaboration with NGOs in the period since the last PAG meeting were the following:

- (1) Nongovernmental Development Organizations (NGDO) Coordination Group for Ivermectin Distribution
- (2) Lions Clubs International Foundation - SightFirst Programme
- (3) Consultative Group of Nongovernmental Organizations to the WHO Programme for the Prevention of Blindness and Task Force Development

- (1) The *NGDO Coordination Group for Ivermectin Distribution* was now formally established and had regular meetings. Membership included the following NGDOs:

Africare
Christoffel Blindenmission e.V.
Helen Keller International
Interchurch Medical Assistance Inc.
International Eye Foundation

Lions Clubs International Foundation (recent member)
Organisation pour la Prévention de la Cécité
River Blindness Foundation (with effect from 1 July 1995)
Sight Savers International
The Mectizan® Donation Program

The Group had held meetings twice a year so far, reflecting an ongoing strong development of activities (see section 2 for reports of the Coordination Group meetings held). It was estimated that the Coordination Group member organizations had provided ivermectin to some 4.5 million people in onchocerciasis-endemic areas outside the Onchocerciasis Control Programme (OCP) in West Africa. The member organizations were presently working in 10 of the 16 endemic African countries outside the OCP area; some members were also involved in the Onchocerciasis Elimination Programme in the Americas (OEPA).

The Coordination Group had developed a comprehensive procedural manual on ivermectin distribution schemes, which was presently being tested in selected countries. The NGDO Coordination Group was also playing an important role in the development of partnerships for the new African Programme for Onchocerciasis Control (APOC) being conceived by the World Bank, together with the other sponsoring agencies for OCP, namely, the Food and Agriculture Organization (FAO), the United Nations Development Programme (UNDP) and WHO. It was envisaged that the latter organization would become the executing agency for APOC, which would cover the 16 remaining onchocerciasis-endemic countries outside the OCP area. APOC would be based almost entirely on annual distribution of ivermectin, as part of PHC, in endemic areas; it was projected for a total budget in the order of US\$ 120 million and for a duration of 10 years. The NGDO Coordination Group was becoming closely involved in APOC, to work with ministries of health in assisting in the building-up of national programmes. It was envisaged that the WHO/PBL coordinator for the NGDO Group would serve as a liaison and support person between the member organizations and APOC headquarters in Africa. The official launching of APOC was expected to take place before the end of 1995, hosted by the World Bank.

(2) The *SightFirst Programme of the Lions Clubs International Foundation* was the Lions worldwide initiative to fight preventable and reversible blindness. Funded by the Lions Clubs International Foundation, projects were developed and implemented by Lions around the world to attack the major causes of blindness. Projects were designed to serve the poorest of the poor and to use sustainable strategies with appropriate technology for the project and the region of the world.

SightFirst was launched in 1990, and was celebrating its fifth anniversary in 1995-1996. Lions were aided in the development and implementation of SightFirst projects by Technical Advisers, experts on public eye health care who acted as consultants to Lions on SightFirst. Lions were encouraged to avail themselves of appropriate partnerships with nongovernmental organizations and others who could work together with the local Lions to achieve the goals of SightFirst.

As an organization in official standing with the United Nations, Lions Clubs International worked closely with the World Health Organization and, specifically, the Prevention of Blindness Programme in planning the SightFirst Programme. Several SightFirst projects were being conducted in conjunction with WHO collaborating centres around the world.

SightFirst project applications were prepared by Lions and then considered by the SightFirst Advisory Committee, a group consisting of Lions leaders and non-Lions blindness prevention experts. Approved applications were granted funds and were coordinated by the SightFirst Department, LCIF, at international headquarters in Oak Brook, Illinois, USA.

To date, Lions SightFirst projects had been awarded in 46 countries on five continents. Those 240 grants included projects for cataract surgeries, the construction of new ophthalmic care facilities, the training of ophthalmic personnel, the distribution of ivermectin to fight river blindness, and the education of the public on eye diseases and preventive care.

(3) The *Consultative Group of Nongovernmental Organizations to the WHO Programme for the Prevention of Blindness* had been established in 1986. It had fulfilled a very important function in the development and strengthening of collaborative activities between the WHO Programme and a group of NGOs. However, as the growth of NGO-supported activities continued, it became obvious that there was a need for a more flexible formula for consultations and exchange of information, while keeping the operational advantages of joint projects.

For these reasons, it had been decided, in a recent meeting held in Geneva, that the Partnership Committee of NGOs collaborating with the WHO Programme would take on the previous role of the Consultative Group. The Partnership Committee presently included 25 member organizations, covering activities from prevention of blindness to low vision care and rehabilitation for the blind. This Committee would have, as its operational arm, a Task Force which would consist of a few members making fixed financial commitments to the WHO Programme on an annual basis, for joint projects. The Partnership Committee would meet annually, whereas the Task Force would meet more frequently, as needed for programme developments. A number of joint activities had already been initiated and supported through the Task Force, and several others were to follow in the course of 1995.

7. EYE CARE STRATEGIES BY NONGOVERNMENTAL DEVELOPMENT ORGANIZATIONS

A document on "Eye care strategies", prepared by the Partnership Committee of the NGDOs as a guideline for field projects, was tabled.

The Group members welcomed the issue of the document and suggested that it be updated periodically to include changes in strategies and interventions.

8. ORIENTATION OF FUTURE PROGRAMME DEVELOPMENTS

In discussing the direction the Programme should pursue, the Group recommended the following steps:

- (1) Continuing to create greater visibility for prevention of blindness and urging renewed government commitment.
- (2) Attention should continue to be paid to common diseases which were on the decline, for example onchocerciasis and trachoma. A trachoma task force would be a way for spearheading future action.
- (3) National programme development should be further strengthened and action taken to refine evaluation models, for instance for cataract surgery, including cost-effectiveness studies.
- (4) Addressing emerging problems, such as low vision care in the elderly and greater involvement in control of diabetic retinopathy, in collaboration with the WHO Diabetes Programme, was recommended.
- (5) It was suggested that, when results of present studies on quality of life became available, a workshop be held to collate experiences and prepare refined protocols.

OTHER ACTIVITIES

Possible topics for inclusion in the next PAG meeting in 1997 could include, among others, the following:

- New strategies for dealing with corneal blindness, including a review of eye banking regulations.
- The impact of interventions for trachoma and onchocerciasis in the development of primary health care.
- Evaluation of national programmes and development of models.
- Update on childhood blindness and, possibly, a review of ocular trauma.

CONCLUSIONS AND RECOMMENDATIONS

PREAMBLE

The Group recognized the excellent leadership, effectiveness and success of the WHO Programme for the Prevention of Blindness (WHO/PBL) over the past 15 years and the valuable collaboration of the international nongovernmental development organizations (INGDOs) in programme implementation. However, it strongly reiterated that the achievements gained so far could be assured and built upon collaboratively in the future only if the Programme continued to receive sufficient visibility and support within WHO and Member States.

The Group also noted with appreciation the recent involvement of the World Bank, on the initiative of the Government of India, in controlling cataract blindness in India, in partnership with WHO, DANIDA and the nongovernmental organizations concerned.

1. CATARACT

There had been some very encouraging developments in the promotion and delivery of high-volume, good-quality, low-cost cataract services, particularly with the increasing availability of high-quality affordable intraocular lenses and increased resources for cataract services.

1.1 Despite the progress made, the Group noted with concern the fact that recent data from WHO/PBL estimated the global backlog of cataract blindness to be 16 million people, reflecting demographic changes and growing populations.

1.2 The Group took note of the clinical trials which were presently under way to evaluate posterior chamber intraocular lenses (PC-IOLs) and anterior chamber intraocular lenses (AC-IOLs) in developing world situations. Those results would be of great importance to the future development of strategies to control cataract blindness.

1.3 The Group recommended the development and use of a simplified grading system for cataract, which would enable uniform collection of data in developing countries on the epidemiology of cataract, including incidence.

In view of those developments, it was important that indicators be developed to monitor the quantity and quality of cataract service delivery, including the aspect of sight restoration assessment. It was recommended that the Programme convene a workshop to define appropriate technical and quality-of-life indicators which could be used by programme managers and ophthalmologists.

The Group recognized the critical role of medical colleges and training facilities in ensuring a high standard of training in cataract surgery.

In order to achieve this aim, it was vital that the ophthalmological profession give full support to developing these training programmes.

2. INTRAOCULAR LENS GUIDELINES

The Group took note of and fully endorsed the document WHO/PBL/94.39, giving guidelines for the manufacture of intraocular lenses by cooperating non-profit organizations in developing countries.

It was recommended that information on this important issue be given through newsletters and similar material for ophthalmologists and programme managers in order to promote their acceptance of low-cost, high-quality intraocular lenses. It was further recommended that the Group be kept regularly informed of further developments in this field.

3. TRACHOMA

Trachoma remained the major cause of preventable blindness. It was a family disease, disproportionately affecting women and their children who lived in the poorest communities, often with inadequate sanitation and water supplies.

Recent developments in the control of trachoma had included the elaboration of training materials, the development of community-based lid surgery schemes, and clinical trials of a new antibiotic - azithromycin.

The Group recommended the formation of a trachoma task force to develop preventive and curative strategies, mobilize resources and recommend priorities for the elimination of trachomatous blindness, in view of the unique advantages of azithromycin in the treatment of infectious trachoma.

The trachoma task force should include representatives of the WHO/PBL Programme, selected WHO collaborating centres, interested NGOs and donor agencies, including pharmaceutical and medical supply firms, and individuals with expertise in the field of trachoma control.

4. DIABETIC RETINOPATHY

In those areas where infections and nutritional causes of blindness had been controlled and where there were well-developed cataract services, emphasis should be given to addressing the problem of diabetic retinopathy, focusing on public education.

It was therefore recommended that action be taken to develop and promote an appropriate and affordable strategy for the control of blindness from diabetic retinopathy, in consultation with the WHO Programme on Diabetes.

5. LOW VISION CARE IN THE ELDERLY

The Group noted that the document "Management of low vision in children" filled a felt need to address this problem.

The Group now recognized that there was a rapidly escalating need globally for low vision care in the adult and, particularly, elderly populations, given the demographic changes in populations.

It was recommended that the WHO/PBL Programme prepare similar management guidelines for low vision care in the elderly, in collaboration with concerned nongovernmental organizations.

6. TRAINING IN COMMUNITY OPHTHALMOLOGY/EYE HEALTH

There was an increasing awareness among training institutions and the ophthalmological profession concerning the importance of community ophthalmology.

Several WHO collaborating centres had been involved in developing and conducting training programmes in community ophthalmology, and new programmes were now being planned in different regions of the world.

It was therefore an opportune time for the PBL Programme, with support from the Task Force of NGOs, to convene a workshop for principals from those training centres of community ophthalmology in order to develop a core curriculum, addressing the question of provision of training materials, and to consider sources of funding and certification for those courses.

7. COLLABORATION WITH INTERNATIONAL NONGOVERNMENTAL DEVELOPMENT ORGANIZATIONS

The Group considered a report from the INGDOs on the ongoing collaboration with the Programme.

The Group appreciated the recent restructuring of the Partnership Committee and Consultative Group, which now allowed greater consultation between the WHO Programme and more than 25 INGDOs in the Partnership Committee. The Group also welcomed the formation of a Task Force of the Partnership Committee to work with the Programme in order to initiate and support new prevention of blindness activities.

The Group took note of a very useful document from the Partnership Committee on strategies for developing eye care services in developing countries. The Group recommended that this document be regularly updated and made available through the INGDO network.

8. COLLABORATING CENTRES

The Group received the reports of the collaborating centres and appreciated the excellent work being carried out by those centres.

There were at present 21 WHO collaborating centres in the WHO/PBL Programme. Those centres were at different levels of development and activities. It was recommended that a meeting of collaborating centres be convened to provide an opportunity for interchange of information, intercentre collaboration and the development of a sustainable networking between those centres in support of the WHO Programme for the Prevention of Blindness.

More specifically, the meeting would address the major research issues and special training needs, including mid-level personnel, required for the prevention of blindness.

9. ASSESSMENT OF OUTCOMES IN PREVENTION OF BLINDNESS PROGRAMMES

There was an increasing awareness of the critical importance of measuring both the level of disability of a blinding eye disease as well as the effect of an intervention. There were protocols being designed and developed to undertake those measurements of visual function, quality of life and patient satisfaction. Those instruments could be used in conjunction with the conventional measurements of visual acuity and/or visual field.

It was recommended that the development, evaluation and application of such an instrument be pursued. It was further recommended that a workshop be convened when the instruments were validated, to consider their application in prevention of blindness programmes.

ANNEX 1

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ANNEX 2

REGIONAL DIRECTOR'S ADDRESS TO THE MEETING

Distinguished Participants, Ladies and Gentlemen.

It gives me great pleasure and I consider myself privileged to be amongst this august gathering of the members of the Programme Advisory Group on the Prevention of Blindness. I am pleased to see here so many prominent personalities representing various international agencies, nongovernmental organizations and WHO collaborating centres, which signifies the urgency and importance of the need for the prevention and control of blindness throughout the world.

As all of us know, blindness is one of the most common disabilities in both developed and developing countries. It is estimated that there are nearly 150 million people who are affected by severe visual impairment and disability. An estimated 38 million people in the world are blind, out of whom 34.4 million are in the developing countries. This poses all kinds of medical, social, economic, educational and vocational problems for these countries.

To tackle this enormous challenge, the Eighth General Programme of Work of WHO, covering the period 1990-1995, had set a target of reducing the level of blindness to less than 0.5% as a whole, with no more than 1% prevalence in some communities. For this purpose, the WHO Programme for the Prevention of Blindness has been supporting Member States in the assessment of the magnitude of blindness and in the formulation and implementation of national blindness prevention programmes. The main activities undertaken have included training of various categories of eye care personnel, strengthening of optimal eye care structures, development and application of appropriate ophthalmic technologies, and fostering community participation and intersectoral actions. Special efforts were also made to develop data banks on eye problems, explore availability of extrabudgetary resources and strengthen partnership with other relevant international agencies and nongovernmental organizations.

However, in spite of the vigorous efforts made at the global, regional and country levels, the prevalence of blindness, particularly the backlog of cataract blindness, is still accumulating in many of the developing countries. This calls for an in-depth review and reorientation of the ongoing activities. Corrective measures must be taken urgently to make our strategies and approaches more effective and result-oriented. In this connection, I would like to share some thoughts with you.

As you would agree, many of the causative factors for visual impairment and blindness are preventable or avoidable through primary and secondary interventions. Therefore, there is a need for directing our efforts towards strengthening preventive care at the community level involving all programmes and services, such as immunization, maternal and child health, nutrition and PHC programmes. Maximum utilization of the existing PHC infrastructure and personnel is essential for minimizing the occurrence of many forms of blindness. Experience has also shown that, with motivation and proper training, blindness prevention programmes can benefit a great deal from the involvement of non-medical persons, such as schoolteachers, schoolchildren, community health volunteers, etc.

Annex 2

The task of clearing the huge backlog of cataract cases presents a great challenge in many developing countries. Strengthening of national capabilities, such as improving eye care facilities and upgrading professional skills for increased performance both in institutional and in outreach services, should receive continuous support in these countries. Nongovernmental organizations and, to some extent, the private sector play an important role in the blindness prevention programmes by undertaking part of the preventive and curative services in concert with national health services. For this purpose, proper coordination of activities and appropriate supportive mechanisms for training, supplies and material and technical support have been put in place in a number of countries. If these were further strengthened, it would certainly lead to expansion of eye care services and a high volume of cataract operations.

The quality aspect, particularly of outreach and eye camp activities, is also a matter of concern in blindness control programmes. More attention should be given to the quality of output rather than to its volume. This will be possible through the development and application of quality indicators, laying down of suitable guidelines for standard operation procedures, provision of minimum acceptable facilities and supplies, as well as necessary training, technical supervision and an inbuilt system of follow-up for the patients.

In order to make our programmes effective, awareness about preventive measures and control activities against avoidable blindness should be substantially increased among policy-makers and the general public. Intensive public awareness campaigns should be undertaken in order to create mass social support and community participation. Particular efforts should be made for generating service demand among the underprivileged and underserved segments of our populations and addressing their unmet needs.

Sufficient provision of necessary consumables and supplies is one of the important prerequisites for basic eye care and cataract operations. I am pleased to note that several countries in our Region, particularly India, Myanmar and Nepal, have taken steps for indigenous production of acceptable standards of intraocular lenses, spectacles and other items at affordable costs. Such production should be replicated in other countries.

Distinguished participants, ladies and gentlemen, I have tried to put forward a few points for strengthening the programmes of prevention of blindness. I have no doubt you will come up with many more ideas during your deliberations.

With these words, I wish you all success in your deliberations and a pleasant stay in New Delhi.

Thank you.

ANNEX 3

AGENDA

Opening of Meeting
Election of Officers
Adoption of Agenda

1. Review of Prevention of Blindness Programme developments
 - (i) Global level
 - (ii) In the regions
2. Overview of Programme documentation
3. Assessment of national programme developments
4. Ongoing and planned applied research
5. Activities of WHO collaborating centres for the prevention of blindness
6. Collaboration with nongovernmental organizations
 - (i) Nongovernmental Development Organizations Coordination Group for Ivermectin Distribution
 - (ii) SightFirst (Lions Clubs International Foundation)
 - (iii) Consultative Group of Nongovernmental Organizations to the WHO Programme for the Prevention of Blindness and Task Force Development
 - (iv) Other activities
7. Eye care strategies by nongovernmental development organizations
8. Orientation of future programme developments
9. Any other matters

Conclusions and recommendations

Closure

ANNEX 4

**STATUS OF NATIONAL BLINDNESS PREVENTION
PLANS AND PROGRAMMES
AS AT 30 JUNE 1995**

REGIONAL OFFICE FOR THE AMERICAS	Plan	Committee	Programme
Antigua and Barbuda	-	-	-
Argentina	*	*	*
Bahamas	-	-	-
Barbados	+	-	-
Belize	+	+	+
Bolivia	+	+	+
Brazil	+	-	+
Canada	-	-	-
Chile	-	-	-
Colombia	+	+	+
Costa Rica	+	-	-
Cuba	-	-	-
Dominica	-	-	-
Dominican Republic	-	-	-
Ecuador	+	+	+
El Salvador	+	+	+
Grenada	+	+	*
Guatemala	+	+	+
Guyana	+	+	+
Haiti	-	-	-
Honduras	+	*	+
Jamaica	+	+	-
Mexico	+	-	-
Nicaragua	+	-	+
Panama	-	-	-
Paraguay	+	+	+
Peru	+	+	+
Puerto Rico	-	-	-
Saint Kitts and Nevis	-	-	-
Saint Lucia	+	+	*
Saint Vincent and the Grenadines	+	+	*
Suriname	-	-	-
Trinidad and Tobago	-	-	-
United States of America	-	+	-
Uruguay	+	+	-
Venezuela	+	?	?

* = In preparation.

REGIONAL OFFICE FOR AFRICA	Plan	Committee	Programme
Algeria	-	-	-
Angola	-	-	-
Benin	+	+	+
Botswana	?	+	+
Burkina Faso	+	?	+
Burundi	+	-	-
Cameroon	*	+	+
Cape Verde	-	-	-
Central African Republic	+	-	-
Chad	+	-	+
Comoros	+	-	-
Congo	+	-	-
Côte d'Ivoire	-	-	-
Equatorial Guinea	-	-	-
Eritrea	+	+	+
Ethiopia	+	+	+
Gabon	+	-	-
Gambia	+	+	+
Ghana	+	+	+
Guinea	+	-	+
Guinea-Bissau	*	+	+
Kenya	+	+	+
Lesotho	+	-	+
Liberia	-	-	-
Madagascar	-	+	-
Malawi	+	+	+
Mali	+	+	+
Mauritania	+	+	+
Mauritius	-	-	-
Mozambique	+	+	+
Namibia	*	+	+
Niger	+	+	+
Nigeria	+	+	+
Rwanda	-	-	-
Sao Tome and Principe	-	-	-
Senegal	+	-	+
Seychelles	-	-	-
Sierra Leone	+	+	+
South Africa	*	+	+
Swaziland	+	+	-
Togo	+	+	-
Uganda	+	+	+
United Republic of Tanzania	+	+	+
Zaire	-	+	-
Zambia	+	+	+
Zimbabwe	+	+	+

* = In preparation.

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REGIONAL OFFICE FOR SOUTH-EAST ASIA	Plan	Committee	Programme
Bangladesh	+	+	+
Bhutan	+	-	+
Democratic People's Republic of Korea	+	?	?
India	+	+	+
Indonesia	+	+	+
Maldives	+	-	-
Mongolia	+	+	+
Myanmar	+	+	+
Nepal	+	+	+
Sri Lanka	+	+	+
Thailand	+	+	+

REGIONAL OFFICE FOR THE EASTERN MEDITERRANEAN	Plan	Committee	Programme
Afghanistan	+	?	?
Bahrain	-	-	-
Cyprus	-	-	-
Djibouti	-	-	-
Egypt	-	-	-
Iran (Islamic Republic of)	*	*	*
Iraq	+	?	?
Jordan	+	?	?
Kuwait	-	-	-
Lebanon	-	-	-
Libyan Arab Jamahiriya	+	+	+
Morocco	+	-	+
Oman	+	?	?
Pakistan	+	+	+
Qatar	-	-	-
Saudi Arabia	+	+	+
Somalia	?	?	?
Sudan	+	+	+
Syrian Arab Republic	-	-	-
Tunisia	+	*	+
United Arab Emirates	-	-	-
Yemen	+	?	?

* = In preparation.

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REGIONAL OFFICE FOR THE WESTERN PACIFIC	Plan	Committee	Programme
Australia	(+)	-	(+)
Brunei Darussalam	-	-	-
Cambodia	+	+	+
China	+	+	+
Cook Islands	-	-	-
Fiji	+	+	+
Japan	-	+	-
Kiribati	+	+	+
Lao People's Democratic Republic	+	+	+
Malaysia	+	+	+
Marshall Islands	-	-	-
Micronesia (Federated States of)	*	-	-
New Zealand	-	-	-
Papua New Guinea	+	+	+
Philippines	+	+	+
Republic of Korea	+	+	+
Samoa	-	-	+
Singapore	+	+	+
Solomon Islands	+	-	+
Tokelau	-	-	-
Tonga	+	-	+
Tuvalu	-	-	-
Vanuatu	-	-	+
Viet Nam	+	+	+

* = In preparation.

(+) = Only for specific population groups (aborigines).

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REGIONAL OFFICE FOR EUROPE	Plan	Committee	Programme
Albania	-	-	-
Armenia	-	-	-
Austria	-	-	-
Azerbaijan	+	-	+
Belarus	-	-	-
Belgium	-	-	-
Bosnia and Herzegovina	-	-	-
Bulgaria	*	+	-
Croatia	-	+	-
Czech Republic	-	+	-
Denmark	-	+	-
Estonia	-	-	-
Finland	-	-	-
France	-	+	-
Georgia	-	-	-
Germany	-	+	-
Greece	-	-	-
Hungary	*	*	-
Iceland	+	-	-
Ireland	-	-	-
Israel	-	+	-
Italy	-	+	-
Kazakhstan	*	-	*
Kyrgyzstan	-	-	-
Latvia	-	-	-
Lithuania	-	-	-
Luxembourg	-	-	-

REGIONAL OFFICE FOR EUROPE (continued)	Plan	Committee	Programme
Macedonia (The Former Yugoslav Republic of)	-	-	-
Malta	-	-	-
Monaco	-	-	-
Netherlands	-	-	-
Norway	-	+	-
Poland	-	-	-
Portugal	-	-	-
Republic of Moldova	-	-	-
Romania	-	-	-
Russian Federation	+	*	*
San Marino	-	-	-
Slovakia	-	-	-
Slovenia	-	-	-
Spain	-	-	-
Sweden	-	+	-
Switzerland	-	-	-
Tajikistan	*	+	+
Turkey	+	+	+
Turkmenistan	-	-	-
Ukraine	-	-	-
United Kingdom of Great Britain and Northern Ireland	-	*	-
Uzbekistan	-	-	-
Yugoslavia	-	-	-
<i>Non-Member States</i>			
Holy See	-	-	-
Liechtenstein	-	-	-

* = In preparation.

ANNEX 5

**REPORTS OF THE WHO COLLABORATING CENTRES
FOR THE PREVENTION OF BLINDNESS**

**DEPARTMENT OF OPHTHALMOLOGY, UNIVERSITY OF NAIROBI
KENYATTA NATIONAL HOSPITAL
NAIROBI, KENYA**

Director: Professor H. S. Adala

The Department of Ophthalmology, University of Nairobi, is mainly concerned with the training of ophthalmologists but also undertakes undergraduate teaching and supplements training of ophthalmic clinical officers. The ophthalmologists trained obtain an M.Med. degree.

The following is a summary of the Centre's activities during the years 1993 and 1994.

Training

(1) *M.Med. training*

(a) Intake

A total of five doctors were taken for training in 1993-1994. The students comprised three Kenyans and two Cameroonians.

(b) Final examination

Three doctors qualified as ophthalmologists, of whom one was Ugandan and two were Kenyans. The Ugandan has since returned to Uganda, where she is working in a Mission Hospital. The two Kenyans have left the country: one is in South Africa, the other in the United Kingdom.

(2) *Undergraduate training*

This continued as before and a total of 220 students have had their rotation through the Department, i.e., fifth-year and third-year medical students.

(3) *Clinical officers*

A total of eight clinical officers qualified with Diploma in Ophthalmology, while a further five qualified as ophthalmic clinical officers (cataract surgeons). The Centre was involved in examining the practical aspect of the examinations, i.e., while performing cataract extractions.

Teaching at the Centre was disrupted during 1994 due to the lecturers' strike and then, later, the junior doctors' strike. However, teaching resumed in October 1994.

Annex 5**Research**

- (1) *Completed research projects*
 - (a) Corneal anaesthesia in leprosy
 - (b) Glaucoma among first-degree relatives of patients with chronic simple glaucoma
 - (c) Prevalence of congenital glaucoma as seen at Kenyatta National Hospital
- (2) *Projects in progress*
 - (a) Ocular aids in children
 - (b) Ocular trauma in Nairobi Hospital

Presentations

- (1) *Ophthalmological Society of East Africa 1993-1994*
- (2) *International Conference on Prevention of Blindness - Berlin, Germany, May 1994*
- (3) *IAPB - Berlin, Germany, May 1994*

Three members from the Centre attended the conference.
- (4) *Tropical Ophthalmology Course - Munich, Germany, October 1994*

Outreach programme

This programme continued throughout 1993. Due to the lecturers' and doctors' strikes, it was not active during 1994. However, two rural hospitals were visited and the Centre's students also joined eye camps organized by Lions Clubs.

Collaboration with other institutions

- (1) *Kenya National Prevention of Blindness Committee*

The Centre continued to be represented at the Kenya National Prevention of Blindness Committee.

- (2) *IAPB*

A member of the Centre was elected to be country representative (Kenya) at IAPB.

- (3) *Munich University Eye Hospital*

The Centre continued to get support throughout 1993-1994 from Munich University Eye Hospital. A variety of equipment was supplied.

- (4) *Sight Savers (United Kingdom)*

Supported the Department by supply of surgical instruments.

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INSTITUT D'OPHTALMOLOGIE TROPICALE DE L'AFRIQUE (INSTITUTE OF TROPICAL OPHTHALMOLOGY IN AFRICA) BAMAKO, MALI

Director: Dr S. Resnikoff

The Institute of Tropical Ophthalmology in Africa (IOTA) is under the authority of the Organization for Coordination and Cooperation in the Control of Major Endemic Diseases (OCCGE), which has eight member states: Benin, Côte d'Ivoire, Burkina Faso, Mali, Mauritania, Niger, Senegal and Togo. It offers services also to all the other French-speaking countries in Africa.

In accordance with its statutes, IOTA undertakes four types of activity: training, research, support to countries and provision of tertiary-level eye care.

Training

Thanks to support from the PBL Programme and many financial partners (Coopération française, European Union and nongovernmental organizations, especially Christoffel Blindenmission, Organisation pour la Prévention de la Cécité, SightFirst, Sight Savers International), the training capacity of IOTA is at its maximum.

(1) Ophthalmologists

Over the last biennium (1993-1994), six specialists completed their training (Cameroon 1, Mali 1, Niger 2, Central African Republic 1, Senegal 1). Thirteen others are undergoing training (Burkina Faso 3, Cameroon 1, Mali 3, Madagascar 2, Niger 2, Senegal 2).

(2) Eighteen nurses specialized in ophthalmology completed their training at IOTA in 1993 and 1994 (Benin 3, Burkina Faso 1, Cameroon 1, Guinea 2, Mali 8, Niger 2, Senegal 1). Twenty-seven others are undergoing training (Benin 3, Cameroon 3, Central African Republic 1, Chad 4, Comores 1, Djibouti 1, Guinea 2, Mali 6, Niger 1, Senegal 3, Togo 1, Zambia 1).

(3) Cataract surgery

Fifteen physicians or nurses received specific training in cataract surgery (Benin 2, Burkina Faso 1, Chad 2, Comores 1, Gabon 1, Guinea 2, Mali 1, Niger 3, Senegal 1, Yemen 1).

(4) Since its establishment in 1993, the course for training spectacle-makers has taken on six trainees (Burkina Faso 2, Cameroon 1, Mali 3).

(5) Forty-three people were provided with specific training courses.

The considerable growth of training activities over 1993-1994 is attributable mainly to the opening of the SightFirst training centre and the provision of a large number of grants for IOTA.

Research

The main programmes completed dealt with trachoma (the impact of water supply, community-based treatment), xerophthalmia (the role of factors such as climate and urban growth) and cataract (the use of intraocular implants in Africa, cost of treatment).

The programmes in progress concern mainly outpatient treatment of cataract (in collaboration with PBL and the National Eye Institute (NEI), Bethesda, USA), the use of eye health centres

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(therapeutic itinerary and identification of obstacles) and the economic and social aspects of blindness in sub-Saharan Africa.

Support to States

IOTA continues to provide services in various areas: a regional planning seminar (with the support of PBL), the establishment of a French-speaking network of public health ophthalmology, evaluation of national or local programmes (in Burkina Faso and Cameroon) and national seminars (in Madagascar in collaboration with PBL, and in Mali).

Provision of specialist eye care

In this area, the volume of activity is stable (35 000 consultations, 2500 surgical operations, 3800 further examinations), since it is limited by various institutional and logistic constraints. Complete renovation is planned for 1995-1996.

Prospects

Two projects are to be developed in the course of 1995:

- (1) The organization of a public health ophthalmology course in French, co-sponsored by Coopération française and WHO.
- (2) The establishment of a regional programme, financed by the European Union, for the benefit of the eight OCCGE member states.

**NATIONAL EYE CENTRE
KADUNA, NIGERIA**

Director: Professor A. Abiose

The National Eye Centre, Kaduna, Nigeria, is the apex institution for the practice of ophthalmology in Nigeria and the headquarters for the National Programme for the Prevention of Blindness. The most significant activities of the Centre during 1993 and 1994 have been mainly in the areas of manpower development and operational research. The Centre also started providing clinical services within the institution during the year 1993.

Human resource development

The Centre was involved in the training of various cadres of manpower for eye care and blindness prevention activities, along the lines agreed for West Africa at the Accra and Banjul meetings of the World Health Organization (WHO) and West African Health Community (WAHC) respectively.

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Fellowship training

Four trainees completed their fellowship training during this period and there was a new intake of 10 others who are now at various stages of their training.

Diploma in Ophthalmology

The Centre ran the one-month community eye health module of the 18-month Diploma in Ophthalmology course, in May 1994, and also provided clinical training for two doctors on this course. The planning for a similar course, which will be open to other ophthalmologists, was undertaken in conjunction with the International Centre for Eye Health (ICEH), London, which will participate in the 1995 course. One of the Centre's ophthalmologists has just completed the M.Sc. (ICEH) course and will now be the coordinator of future courses.

Primary eye care trainers course

A three-month course to retrain ophthalmic nurses as primary eye care trainers was conducted from January to March 1994. Although it was thrown open to countries in the West African subregion, all 20 participants came from eight States in Nigeria. Sight Savers International provided them with basic kits at the conclusion of their training. These nurses are now equipped to train integrated eye care workers in their various States.

Community health extension workers and community health officers

The Centre ran several courses on primary eye care for these cadres to enable them to function as integrated eye care workers.

Workshop

The Centre provided a venue for several workshops during the period, including the WHO Onchocerciasis Operational Research Workshop.

National Committee for Prevention of Blindness

As the national headquarters for the National Programme for Prevention of Blindness (NPPB), the Centre continues to recommend to government policy guidelines and also sees to their execution. In this regard, population-based blindness prevalence surveys have been completed in four States. Advocacy visits have been undertaken to other States to develop effective eye care programmes. Committees have now been formed in 25 out of 30 States. The Centre is also encouraging other ophthalmologists nationwide to develop outreach programmes to serve populations adjacent to their locations.

Research

Onchocerciasis operational research carried out by the Centre has led to the acceptance of height as a surrogate for weight in determining dosage of ivermectin. A long-term follow-up study of the effect of ivermectin on onchocercal skin and eye disease was commenced in 1994 and should be brought to a conclusion in 1995.

(1) *Community-based ivermectin treatment*

The community-based ivermectin treatment for onchocerciasis was extended beyond the initial three local government areas (LGAs) to six additional LGAs. The numbers dosed and the population covered have increased significantly in 1994.

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(2) *Monitoring and evaluation of activities*

An evaluation of the community-based ivermectin programme was carried out in 1994, in conjunction with Sight Savers, and the recommendations emanating therefrom are being implemented. Planning meetings have been held for the five-year evaluation of the Kaduna State Eye Care Programme, which is scheduled for September 1995. This will be carried out jointly by the Federal Ministry of Health, Kaduna State Government, Sight Savers and the National Eye Centre.

Future work

(1) *Low-cost production of spectacles*

The equipment and materials donated by the World Health Organization for setting up the optical workshop to produce low-cost spectacles have just started to arrive. Installation will commence immediately all the supplies are received.

(2) *Low-cost production of eye drops*

This has been going on for about five years, but the difficulty is now faced of obtaining galenicals and bottle-stoppers.

(3) *Research*

The proposed work on "epidemiology of glaucoma and the effect of early diagnosis and surgery on the outcome of the disease" is still in its infancy.

INSTITUTO DE SAUDE, SERVICO DE OFTALMOLOGIA SANITARIA
(SANITARY OPHTHALMOLOGY SERVICE, STATE HEALTH SECRETARIAT)
SAO PAULO, BRAZIL

Director: Dr O. Monteiro de Barros

During 1993 and 1994, the activities were mainly training of personnel at different levels in eye care and trachoma control.

The Sanitary Ophthalmology Service continues to give advisory services and coordinates all activities of the National Eye Health and Prevention of Blindness Program of the Ministry of Health.

In 1993, a Regional Course and a Regional Seminar of the National Eye Health and Prevention of Blindness Program - Southeastern Region were held in Vitoria, in the State of Espirito Santo, with the objective to give technical support for the implementation of the Program. A total of 36 health professionals participated, representing the States of Sao Paulo, Minas Gerais, Mato Grosso do Sul, Goias, Rio Grande do Sul and Espirito Santo.

Translation and publication of the booklet *Prevention of blindness in leprosy* were undertaken, with support of the WHO Programme for the Prevention of Blindness. It is being distributed to health

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services of Sao Paulo State and other Brazilian States, and to the Portuguese-speaking countries in Africa.

The second edition of the *Primary Eye Care Manual* and of the *Epidemiological Surveillance of Trachoma Manual* were also published and distributed.

The Centre, in collaboration with the Epidemiological Surveillance Center, continued to develop activities in trachoma control in Sao Paulo State. Several training courses, including refresher courses, were held for health personnel to set up the programme in the different municipalities of the State. Other activities for trachoma control have been carried out. Advisory services and supervision to help the different municipalities to set up the programme have been provided. During the 1993-1994 period, more than 4000 new trachoma cases were reported in the State of Sao Paulo.

Courses in prevention of blindness in leprosy were held, with the objective to set up specific activities on prevention of ocular disabilities in the health centres.

The Centre participated in a Trachoma Seminar organized by the School of Public Health of the Sao Paulo University.

Furthermore, a meeting on trachoma control was organized by the City of Sao Paulo Health Department. In collaboration with the City Health Department, the Centre prepared and published the Guidelines for Trachoma Control for the City of Sao Paulo.

Training courses in eye health care were held for the implementation of the Project of School Eye Health, funded by the World Bank.

Trachoma surveys among schoolchildren in the State of Sao Paulo have generally shown low prevalences, with a few exceptions in some regions. However, topical treatment with tetracycline ointment has shown an effectiveness lower than 50%. The reason for such poor results is not yet clear. This shows the need for further research to assess the actual effectiveness of the ongoing treatment under controlled trials, as well as the use of different drugs for trachoma treatment. Studies on health education for trachoma control are being undertaken by the Centre.

Training

	Number of health professionals	
	1993	1994
Trachoma	112	173
Primary eye health course	308	1050
Ocular leprosy	12	24

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**"DR RODOLFO ROBLES V." EYE AND EAR HOSPITAL
GUATEMALA CITY, GUATEMALA**

Director: Dr F. Beltranena

Delivery of services

	1993	1994
Outpatient consultations	38 903	39 858
Surgical services:		
Cataract	1583	1824
Glaucoma	416	520
Retina	722	792
Strabismus	188	215
Other major surgeries	4995	5103
Minor surgery	1160	1148
Total surgeries	9064	9602

Onchocerciasis and mass distribution of ivermectin

During 1993 and 1994, the "Rodolfo Robles V." Hospital has been associated to the National Programme of Eradication of Onchocerciasis. The Centre has been responsible for the clinical assessment of the target population (over 8000 evaluations).

Research

During 1993 and 1994, the Centre, in association with CESSIAM, has produced the following papers dealing with eye-related subjects:

- (1) *Effect of retinopexy on the longitudinal ocular axis as assessed by ultrasonography* (Mendoza)
- (2) *The diagnostic reliability of various methods to assess patency of the lacrimal duct* (Mendoza)
- (3) *Prevalence of undiagnosed pathological conditions in patients with lenticular opacities as revealed by prospective, presurgical ocular ultrasonography* (Gonzalo, Mendoza)
- (4) *Location of the corneal vertex in the normal Guatemalan population* (Vettorazzi)
- (5) *Thickness of the cornea in the normal Guatemalan population* (Vettorazzi)
- (6) *Cytokine levels in tears, saliva, blood and urine in normal controls, in patients with chlamydial infection, and in patients with bacterial conjunctivitis* (Vettorazzi)
- (7) *Profiles for the diagnosis of visual deficits and ocular pathology of schoolchildren of the community of San Pedro Sacatepequez for the project "New opportunities in education"* (Mendoza)

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(8) *Retinol and beta-carotene status of the preschool children of Santa Rosa (Bulux)*

(9) *Compliance with ocular medication regimes for glaucoma in the elderly (Mazariegos)*

Training

	1993	1994
1. Primary eye health		
Trachoma	282	440
Community health promoters	612	667
Public health technicians	17	24
Onchocerciasis:		
Training for field promoters	182	262
Total	1093	1393
2. Medical students		
Two-month elective course - fifth-year students of University of San Carlos	12	12
3. One month required for sixth-year Francisco Marroquin University students	43	45
4. Ophthalmology		
Four-year Resident Programme leading to M.Sc. Ophthalmology degree from the Francisco Marroquin University	32	33

Annex 5**INSTITUTO NACIONAL DE OFTALMOLOGIA
LIMA, PERU***Director: Dr F. Contreras***Postgraduate programme**

There is a three-year residency programme, with students from Peru and other Latin American countries. All of them participate in the prevention of blindness campaigns developed in the peripheral and rural areas.

Research

In 1993, the Institute, with the Pan American Health Organization, developed an Ocular Health and Prevention of Blindness Communications Program. The objective was to know the impact of mass media on the population. This was done through the diffusion on radio and television, and in newspapers, of preventive messages on the most common causes of blindness in the country.

There is permanent research for appropriate technology to reduce costs, through the economical use of sutures, the use of commercial cellulose (wettex) in pieces, plastic eye protectors, etc. The objective is to create guidelines appropriate to reality, which can also be used by ophthalmologists of other regions of the country.

The Centre started and is continuing a project to evaluate patient satisfaction and quality of life (personal, social and work) before and after cataract surgery with intraocular lens.

Considering the economic situation of certain groups of the population, the Centre is evaluating early surgical procedures in cases of chronic glaucoma.

Training

In 1994, the training activities on prevention of blindness were as follows:

Doctors	93
Nurses	228
Students (medicine and nurses)	138
Auxiliary health personnel	129
Teachers	1450
Mothers	980
Social workers	44
Health promoters	820
Work promoters	81
School promoters	1775
Elderly promoters	26

The Peruvian National Eye Institute, through the Committee on Prevention of Blindness of the Pan American Association of Ophthalmology and the Regional Office of IAPB, has links with other Latin American countries. These organizations encourage the creation of national committees on prevention of blindness, national programmes on primary eye care, and regional events such as the

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II Latin American Congress on Prevention of Blindness, to be held in Guayaquil, Ecuador, in June 1995.

There is now in press a Manual on Primary Eye Care. This manual is a joint effort of the Peruvian National Eye Institute and the Pan American Association of Ophthalmology. The objective is to distribute this publication in the region.

**INTERNATIONAL CENTER FOR EPIDEMIOLOGIC
AND PREVENTIVE OPHTHALMOLOGY, DANA CENTER
BALTIMORE, USA**

Director: Dr H. A. Quigley

Introduction

The Dana Center continues training and research programmes in major blinding conditions, with recent emphasis on measurement tools in outcomes assessment, functional studies among community-based populations, and screening for glaucoma.

Training

(1) The fourth public health ophthalmology programme was completed after a one-year course (July 1993 - June 1994). Twelve ophthalmologists, representing every region of the world, completed course work and were awarded the Master of Public Health degree. Each wrote a thesis that outlined a major project in preventive ophthalmology. Plans are under way to implement several of these projects, including a prevalence survey of eye disease in Mexico, studies of blindness in Oceania, public health monitoring of diabetic native Australians, functional outcome measurement after cataract surgery in India, and studies of selective mortality in Bangladesh. The next one-year public health ophthalmology programme is planned to commence in July 1996.

(2) Fellows in preventive ophthalmology undertake a one- to three-year training course in blindness prevention, often including coursework toward a degree in public health. Present fellows are participating in investigations related to: prevalence of macular degeneration in a US population; death rates among members of the Baltimore Eye Survey population; anterior ocular biometry related to angle-closure glaucoma among populations of Europeans, Asians and Africans; and monitoring of progression in visual field testing for glaucoma.

(3) Predoctoral students in public health and medicine continue to choose projects in ocular epidemiology, with the advice of senior faculty. One recent project seeks to improve a detection method for xerophthalmia using pupillary responses.

(4) Vision health aides are now being trained for an expanded role in screening for ocular disease in an urban setting in East Baltimore, Maryland. Under this programme, initial and second-level screening is conducted in the community prior to referral for definitive ophthalmic diagnosis and care. Follow-up monitoring by trained lay persons is being pilot-tested.

Annex 5**Research**

Research programmes of the Dana Center investigate the full range of ocular diseases in the world. A selection of major programmes is given below.

The Baltimore Eye Survey Follow-up Study is presently re-examining a population-based group of adult Americans who were first studied eight years ago. The project will permit estimates of the incidence of cataract, glaucoma and macular degeneration, as well as providing potential improvements in screening techniques for these disorders by both high- and low-technology methods.

The Salisbury Eye Evaluation Study is evaluating 2500 adults over 65 years of age in a US town, with several primary aims. It will study the prevalence and incidence of cataract and macular degeneration, as well as assessing the functional consequences of visual impairment on quality of life, measuring interactions between visual impairment and other co-morbidities, and determining the prevalence of keratitis sicca through improved diagnostic methods.

The Cataract Patient Outcome Research Team completed a five-year study of outcomes of cataract surgery in the US, developing a visual function instrument (VF-14) that is more closely associated with surgical outcome than with visual acuity. In addition, a new study has just begun to investigate 20 000 patients undergoing cataract surgery to assess the need for preoperative medical examinations and laboratory testing.

The Dana Center is participating in a multinational study of the value of oral azithromycin as a mass treatment for trachoma in Africa. The group is evaluating the effect of treatment among persons resident in rural central Tanzania.

The NNIPS II study in Nepal seeks to evaluate the impact of vitamin A supplementation of pregnant women for xerophthalmia among the infant population. In addition, an alternative dose trial of vitamin A supplementation in Indonesia has evaluated the safety of two doses for children in the first year of life.

A prevalence survey for open-angle and angle-closure glaucoma is being carried out at the Collaborating Centre at the Aravind Eye Hospital, with consultation by Dana Center faculty. A survey of eye disease, with specific attention to angle-closure glaucoma, was completed by the Dana Center's group in cooperation with the faculty of the National Taiwan University. Screening methods for angle closure were evaluated and preparations were made for more extensive longitudinal study.

The Dana Center faculty assisted the staff of the Centre for Sight, in Bulgaria, in design and analysis of its population-based Sofia Eye Survey involving more than 6000 persons. Cataract, macular degeneration and glaucoma were found to be the three leading causes of blindness in this Eastern European nation.

A decline in global atmospheric ozone levels may increase ultraviolet light exposure, leading to ocular and dermatological morbidity. In a consultation with Chilean public health officials, the Dana Center studied an area in the extreme southern latitude exposed to a hole in the ozone layer. Measurements of ultraviolet radiation levels and review of radiation-related disease show no clear evidence for concern at this time.

Studies of screening for glaucoma in a community setting have evaluated both objective imaging of the nerve fibre layer and an instrument that measures whole-field scotopic function. Substantial levels of unrecognized ocular disease were detected in a non-ophthalmic medical clinic of a major US university medical school, pointing to the need for improvements in diagnostic efforts.

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NATIONAL EYE INSTITUTE, NATIONAL INSTITUTES OF HEALTH BETHESDA, USA

Director: Dr C. Kupfer

Introduction

The mission of the National Eye Institute (NEI) is to reduce the prevalence of blindness, visual impairment and eye disease worldwide, through basic and applied research and training. Over the past year, NEI has supported investigations of blinding eye diseases with a worldwide impact. These studies are implemented through bilateral agreements between foreign countries and the US; other types of country-to-country programmes, such as those supported by USAID; and collaborative activities with the World Health Organization, the Pan American Health Organization, and foundations and private/voluntary organizations such as Lions Clubs International.

Highlights of international programmes and activities

(1) *Barbados*

Since 1988, the Barbados Eye Study has examined 4200 persons aged 40 to 86 years as part of a population-based study to determine the prevalence and risk factors for glaucoma and other eye disorders. In 1992, the Barbados Incidence Study was initiated to estimate the incidence of glaucoma and other ocular disorders in individuals in the Barbados prevalence survey who were free of disease. In addition, risk factor analysis has been conducted to identify associations with development of glaucoma and to characterize those who have progressive eye disease. (See "The Barbados Eye Study: Prevalence of open angle glaucoma" in the June 1994 issue of *Archives of Ophthalmology*, Vol. 112, No. 6, pp. 821-829.)

(2) *Brazil*

In collaboration with the US National Institute of Allergy and Infectious Diseases and three Brazilian scientific organizations in Sao Paulo, NEI has developed a research programme on the immunology, basic mechanisms and epidemiology of toxoplasmosis in southern Brazil.

(3) *India*

NEI and the Indian Council of Medical Research have developed a collaborative blindness research programme under the 1983 Indo-US Science and Technology Initiative. This programme includes projects to reduce blindness in India from vitamin A deficiency, cataract, and Eales' disease. Indian Government funds for the work come through the ICMR, and US Government funds are provided through the National Science Foundation and NEI. NEI also collaborates with Indian scientists under the US-Indo Subcommission programme.

The NEI Director, the Deputy Director and the Special Advisor to the Director have participated as consultants to the World Bank to develop a proposal by the Government of India for an initiative in cataract blindness control. Intramural scientists from NEI's Laboratory of Mechanisms of Ocular Diseases are collaborating with colleagues at the Centre of Cellular and Molecular Biology in Hyderabad, India, in studies on aging-related modifications to lens crystallins. It has been demonstrated in organ culture studies that chemicals present in smoke, either from tobacco products or from wood fires, can directly damage lenses.

Annex 5(4) *Italy*

The Collaborative Italian-American Study of the Natural History of Age-Related Cataract has completed a four-year follow-up study of cataract. Objectives of the natural history study were to estimate the rates of development and progression of the various types of lens opacities, identify risk factors associated with the development and progression of cataracts, and evaluate cataract classification schemes. Study results will be reported in the *American Journal of Ophthalmology*. Investigators at the University of Parma and NEI are also collaborating in a study to determine whether the complete or partial deletion of the glutathion-S-transferase I (GST I) gene is an important risk factor in the development of senile cataract.

(5) *Mexico*

An international collaboration has been established by scientists in NEI's Laboratory of Mechanisms of Ocular Diseases to investigate the relationship between enzyme deficiency diseases and cataract.

(6) *Sweden*

Many eye diseases, especially retinal degenerations, could be successfully treated if human retinal transplantation were possible. In animal models, visual cells that have been transplanted do not develop and function normally. However, a new differentiating factor has been discovered and is being expressed at NEI, using molecular biology techniques. This factor, which is a protein that causes neuronal-like differentiation, is currently being tested *in vitro* by NEI collaborators in Sweden, at the University of Gothenburg and the University of Lund, to determine if it will cause retinal cell differentiation. The ultimate purpose of these investigations is to develop cells that could be transplanted into the human eye *in vivo* and function normally.

(7) *United Kingdom*

The UK Prospective Diabetes Study is a randomized study of different therapies to determine whether improved blood glucose control or improved blood pressure control of noninsulin-dependent diabetes will reduce morbidity and mortality. The study began in 1977 and has recruited over 5100 newly diagnosed diabetic patients. The development and progression of diabetic retinopathy in these patients are being assessed by retinal photography. The study is currently completing 11 years of patient follow-up.

Activities with international and multinational organizations

In 1994, NEI continued its activities as a WHO Collaborating Centre for the Prevention of Blindness. The NEI Director continued to serve on the WHO Expert Advisory Panel on Trachoma and the Prevention of Blindness. Other NEI staff have, on request, served as consultants to the WHO Programme.

NEI continued to provide technical advice to Lions Clubs International in the development of its US\$ 100 million SightFirst initiative, a global sight conservation programme aimed at substantially reducing the prevalence and incidence of preventable and curable vision loss.

NEI continued to work closely with nongovernmental organizations in designing service and research programmes to reduce the prevalence of blindness, regardless of its etiology, throughout the world. A special emphasis last year and in the next few years will be evaluation of programme performance in selected countries.

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Extramural programmes

In 1994, NEI granted 14 awards to foreign institutions in six countries.

Intramural programmes and activities

NEI continued to serve as an international centre for research and training. In 1994, 25 visiting fellows, 21 visiting associates, 17 visiting scientists, 19 special volunteers and 3 guest researchers from over 20 countries conducted research at NEI's facilities in Bethesda, Maryland.

STORM EYE INSTITUTE, MEDICAL UNIVERSITY OF SOUTH CAROLINA CHARLESTON, USA

Director: Dr D. J. Apple

The WHO Collaborating Centre at the Storm Eye Institute grew rapidly in 1994. Activities included the following:

- (1) In terms of IOL quality, the Centre has now done investigations on IOLs from approximately 60 sources in which IOLs are either made or distributed into the developing world. Approximately 10 were done in the calendar year 1994.

Most importantly, the Centre is pleased to report that measurable improvement in manufacturing quality is noticed. Indeed, recent investigations from two manufacturing sources have demonstrated results that are equal to those obtained from many manufacturers in developed countries, indeed better than some of these companies.

- (a) Some of the best-quality three-piece IOL technology we have observed from the developing world comes from the Aurolab facility in Madurai, India.

- (b) The best-quality one-piece design (the type 3) preferred by the Centre had been manufactured at the facility of The Fred Hollows Foundation in Australia.

The Centre's investigations focus on surface quality and general design. The above-mentioned companies, as well as some others, are now rapidly improving the quality.

The Centre does not focus on such items as compressibility, flexibility, sterilization matters, etc., which relate more to regulatory issues. Its main interest is in the design and surface quality which are directly related to medical issues, including fixation, stability and long-term tolerability of the implant.

The Centre is also happy to report that the IOLs now being made appear more and more suitable for in-the-bag implantation which, of course, is the surgeon's long-term goal.

- (2) The Centre has begun a programme for training physicians participating in developing world ophthalmology. In 1994 (5-16 December), the Centre hosted (under the sponsorship of Christoffel Blindenmission in Bensheim, Germany) two well-known and respected surgeons, namely,

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Albrech Hennig, MD, from Nepal and David Yorston, MD, from Kenya. These gentlemen worked in the Centre for about 10 days (a mini-sabbatical) studying various surgical techniques. They utilized the posterior videotape technique of Miyake, which is situated in the Centre's laboratory, and pathology slides of IOL specimens were done. Numerous videos were made, demonstrating various techniques ranging from the basic ICCE technique, with and without AC-IOL, to simple ECCE, with loupes or microscope, to advanced phakoemulsification techniques with capsulorhexis and insertion of modern capsular lenses, including experimental foldable lenses. It is believed that each individual received a good, balanced experience, and has much to take back to his facility. The Centre plans to continue such a course for many groups in the future.

As a result of his work with Dr Hennig, the Director of the Centre will do a February trip to Nepal to observe Dr Hennig's patients and provide clinical-pathological correlation.

(3) The Centre has done continued research on the issue of anterior chamber lenses and continues to believe that these may play some role in the developing world situation. It has recently published its paper "Are there acceptable anterior chamber intraocular lenses for clinical use in the 1990s?" (*Ophthalmology*, 1994, **101**(12), 1913-1922), which was not only published but presented at the American Academy of Ophthalmology, with good response. In these papers, we reflect the idea that developing world cataract surgery probably requires a **more skilled** surgeon than in the developed world, since good-quality results need to be achieved under less than optimal conditions than are available in industrialized countries. The Centre strongly agrees that an AC-IOL can be well tolerated. The main goal is that these be put into patients with the proper indications and also that the surgeons be **well trained** for AC-IOL implantation. Evidence is accumulating that the main problem with modern AC-IOLs rests in the fact that most surgeons do not have specific training for this and most complications seen and heard about relate to surgical technique problems.

(4) The Centre has written a review article for publication in the *Survey of Ophthalmology*, entitled "Cataract surgery in the developing world", which is now in press. This article covers background and various surgical options for cataract surgery in the developing world and will appear in mid-1995.

(5) The Director of the Centre has given several lectures on the topic of developing world surgery, including a lecture at the American Academy of Ophthalmology in San Francisco, the Gold Medal Lecture delivered at the Saudi Ophthalmological Society in Riyadh, and a keynote lecture at the Greek Ophthalmology Society. These and other lectures have helped call attention to developing world ophthalmology to general ophthalmologists in many countries.

(6) The Director had the pleasure of serving as Honorary Chairman of a meeting of the International Eye Foundation at the American Academy of Ophthalmology meeting in San Francisco.

In summary, the Director feels the most important aspect of the Centre's work has been the fact that, using the prestige of its IOL Center and its academic base, it has been able to deliver a message to many general ophthalmologists regarding the developing world ophthalmology that heretofore has not been emphasized. The Director feels furthermore that manufacturers are now being stimulated towards preparing very modern and appropriate IOL designs that have stood the test of clinical and basic experimentation over the past decade, and in obtaining excellent finish quality, which is mandatory for long-term tolerance within ocular tissues.

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FRANCIS I. PROCTOR FOUNDATION FOR RESEARCH IN OPHTHALMOLOGY SAN FRANCISCO, USA

Director: Dr C. R. Dawson

Chlamydial biology and ocular chlamydial infections: Prevention of blindness

The World Health Organization Collaborating Centre for Prevention of Blindness and Trachoma, at the Francis I. Proctor Foundation, University of California, San Francisco, concentrates on prevention of blindness from trachoma and other ocular infections. Research activities include clinical trials to control infectious trachoma in children with new antibiotics (azithromycin) or to improve hygiene in children (face-washing). Laboratory research on chlamydial immunology and molecular biology is directed at eventual development of a trachoma vaccine.

Trachoma control in Egypt

(1) *Behavioural change to control trachoma in Egypt*

In collaboration with Alexandria University, the San Francisco WHO Prevention of Blindness Centre has carried out a series of epidemiological studies, to compare intensive health education on face-washing of children in one village and equally intensive health education on improving nutrition in a control village. In both villages, all children were given a standard six-week course of topical tetracycline eye ointment. Follow-up examination revealed that intensive health education, coupled to distribution of soap, provided a significant but modest reduction of disease (odds ratio 0.68, $p = .05$).

(2) *Individual azithromycin treatment of trachoma*

Azithromycin, an erythromycin derivative, is a new, long-acting antibiotic which is particularly effective for genital infections with *Chlamydia trachomatis*. To evaluate azithromycin for active trachoma in children, standard intermittent topical tetracycline treatment was first compared to three schedules of azithromycin treatment. All three treatment schedules (including a single dose of azithromycin) were as effective as topical terramycin/polymyxin. Similar results were obtained with individual treatment in Gambia.

(3) *A multicentre trial of community-wide (mass) treatment with azithromycin for endemic trachoma: The Azithromycin Control of Trachoma (ACT) Study*

This study compares mass treatment with topical tetracycline ointment in one village to mass treatment with three once-weekly doses of azithromycin in a second village. This trial is being done simultaneously in Tanzania (Dr Sheila West and associates of Johns Hopkins), in Gambia (Dr David Mabey and others, London School of Hygiene and Tropical Medicine) and in Egypt (San Francisco Collaborating Centre and Alexandria University).

In this trial:

- clinical outcome is determined by direct examination with 2.5+ binocular loupes and by evaluation of clinical photographs of the right upper tarsus of all those examined (Reading Center at the San Francisco WHO Centre of the Proctor Foundation);
- chlamydial infection is determined by the ligase chain reaction (LCR), a variant of polymerase chain reaction technology (PCR);

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- in LCR-positive specimens, PCR testing will be done to detect genetic variations and determine if recurrent disease is due to the same strain of *C. trachomatis*;
- antibody testing of tears will be done to determine the relationship of chlamydial infection to local antibody at the conjunctival surface.

In each country, the following steps are being taken in the ACT trial:

- Census of the village population: includes household census, sleeping rooms, presence and use of latrines, and kind of floor in the house.
- Clinical examinations and photographs of the right eye of all villagers. Swabs for LCR will be obtained from the eyes of all persons examined and from the nasopharynx of 360 substudy subjects with active trachoma.
- Village-wide examinations will be done at three months post-treatment and at one year. Substudy examinations will be done at 180 and 270 days after the start of treatment.

Support for the trial has been obtained from Pfizer International which has supplied the azithromycin, The Edna McConnell Clark Foundation, Abbott Laboratories which is supplying the LCR kits, and the US National Institutes of Health.

If the trial shows that there is a substantial benefit from oral azithromycin, the manufacturer (Pfizer International) is considering making a certain amount of it available for trachoma control each year, as Merck does with ivermectin. Because azithromycin is costly, further operational research is needed to test alternative dosage schedules and treatment schedules, e.g. "cluster" treatment compared to mass treatment.

***Chlamydia trachomatis* laboratory research. Richard Stephens, Deborah Dean and Group**

(1) *Chlamydial immunology*

While infections by *C. trachomatis* are widespread, immunity to chlamydial infection remains poorly understood. *C. trachomatis* includes 15 serovariants determined by antigens on the major outer membrane protein (MOMP). In human vaccine trials and non-human primates, serovar-specific MOMP antigens have ocular protective effects and should be good vaccine candidates. One major new advance in the Centre's laboratory is the construction of a synthetic gene that encodes for the chlamydial MOMP. This synthetic gene can be expressed in other bacteria and is being used to investigate MOMP antigens that are targets of protective immune responses.

(2) *New serovar variant among Tunisian samples and variants among Egyptian samples. D. Dean*

Twenty-eight chlamydial isolates from trachoma in Tunisia have been genotyped. Among B or Ba serovars there is considerable variation in the nucleotide and amino acid sequences. These molecular changes may arise as a result of selective host immune pressure. The variation found in nucleotide sequences in samples collected over a three-year period may represent influx of new B subtypes into the area or, more likely, may be mutations arising from immunological pressure.

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AL-SHIFA TRUST EYE HOSPITAL RAWALPINDI, PAKISTAN

President: Lt. Gen. (Retd) Jahan Dad Khan
Director: Prof. Maj. Gen. (Retd) Nasim Ahmed

Introduction

The institution was designated as a WHO Collaborating Centre in 1992. Its four main spheres of activity include training, research, community ophthalmology and prevention of blindness. Apart from offering tertiary care services, the Centre has also established its Institute of Ophthalmology for training and research.

Training

- (1) A four-year residency programme (fellowship) and a one-year diploma course in ophthalmology have been started, to train 10-15 ophthalmologists per year.
- (2) Twenty ophthalmic medical assistants (ophthalmic technicians) have been trained so far and it is planned to train 20 OMAs annually.
- (3) Sixty ophthalmic nurses have been trained during this period and the Centre will train 25-30 ophthalmic nurses every year, offering a Diploma in Ophthalmic Nursing.
- (4) Three courses have been held on primary eye care for general medical practitioners and master trainers for community health workers. A one-day workshop on primary eye care was conducted by Al-Shifa for national delegates.
- (5) Curricula have been developed for OMAs, diploma in ophthalmic nursing, fellowship- and diploma-level training for ophthalmologists, and primary eye care training for general medical practitioners, master trainers and community health workers.
- (6) The following courses are planned for 1995-1996:
 - M.S. (Master Degree) in Ophthalmology
 - Diploma in Optometry
 - Certificate in Microsurgery for ophthalmologists
 - Post-fellowship training in paediatric ophthalmology and squints, vitreous and retina and cornea and external diseases.

Research

Research programmes address the epidemiology, prevention, clinical manifestations, diagnosis and management of childhood blindness, paediatric ophthalmic disorders, squints, amblyopia, retinoblastoma, corneal infections and diabetic retinopathy. In addition, the Centre is also conducting a community-based research project on integration of primary eye care into primary health care and a developmental research project on producing affordable/low-cost low vision aids using appropriate technology. A Corneal Infections Registry has been established, laying the ground for future development of a reference laboratory for blinding eye infections. Important recent findings include the following:

- Childhood cataract is the commonest cause of childhood blindness in hospital-based studies, while retinal disease is the commonest in blind school studies. Vitamin A

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deficiency-related corneal blindness does not feature prominently as in other South Asian countries. An hereditary basis for childhood blindness is found in 28 to 58%.

- Amblyopia treatment, previously neglected in Pakistan, has shown a compliance rate of almost 60%, with an 80% success rate in the compliant cases.
- Medical misdiagnosis, multiple consultations and long distances are major causes of delay in management of retinoblastoma.
- Exodeviations occur much more commonly in Pakistani patients with an esodeviation: exodeviation ratio of 1.46 : 1 as opposed to 5 : 1 in Caucasians.
- Diabetic retinopathy is an emerging cause of avoidable blindness in Pakistan. Of all patients diagnosed to have diabetic retinopathy, 80% have significant visual loss.
- A population-based survey of the resident Afghan refugees in Pakistan has revealed a high prevalence of blindness rate of 4% and a high prevalence of childhood blindness of 3-4/1000.

Prevention of blindness

(1) The Centre houses the secretariat for the National Committee for Prevention of Blindness and contributed significantly in the preparation of the National Plan for Prevention of Blindness. The Centre was represented at the Fifth General Assembly of IAPB in Berlin, in May 1994, and at a Childhood Blindness Workshop for South Asia in Madurai (Aravind Eye Hospital), in December 1994.

(2) The Centre conducts 20-25 cataract surgery and screening camps annually, in which over 5000 sight-restoring operations have been carried out and over 100 000 patients examined. It has also undertaken a school health screening programme, in which over 150 000 schoolchildren have been screened and 200 teachers trained to check vision.

Future activities

Future activities include the following:

- (1) Development of a unit for low-cost local production of eye drops (LPED)
- (2) Establishment of a national reference laboratory for blindness due to infections
- (3) Establishment of a national centre for control of childhood blindness
- (4) Expansion of current low vision services.

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KING KHALED EYE SPECIALIST HOSPITAL (KKESH) RIYADH, SAUDI ARABIA

Director: Dr I. A. Badr

Introduction

During 1993-1994, the Hospital maintained a high level of activities, taking into consideration the major causes of blindness in the Kingdom and the secondary-tertiary care nature of the institution. On average, annually, 85 000 patients visited the outpatient department, 9500 patients were admitted and 9000 had surgery.

Collaboration with WHO on prevention of blindness

KKESH has participated in the following prevention of blindness activities sponsored by, or associated with, WHO:

- (1) *First IAPB-EMRO Regional Meeting on Prevention of Blindness, Bahrain, November 1993*
- (2) *14th Session of Joint Committee Meeting for the Onchocerciasis Control Programme, Luxembourg, December 1993*
- (3) *Meeting of the WHO Programme Advisory Group on the Prevention of Blindness, Geneva, March 1993*
- (4) *Intercountry Meeting for Evaluating the National Prevention of Blindness Programme, Cairo, April 1993*
- (5) *Effects of Solar UV Radiation on the Eye, Geneva, August 1993*
- (6) *Research Developments on Solar UV-Radiation and Cataractogenesis, Geneva, March 1994*
- (7) *15th Session of Joint Committee Meeting for the Onchocerciasis Control Programme, Côte d'Ivoire, December 1994*

Education

The continuing Medical Education Programme maintained weekly half-day teaching Grand Rounds, organized an annual symposium on "Recent developments in ophthalmology" and a seminar on "Common eye disorders" with a workshop for primary care physicians. In total, 29 international visiting professors contributed to KKESH educational activities during the last two years. KKESH staff have maintained active involvement in national and international ophthalmology meetings.

Training

During the last two years, 11 physicians have completed a four-year ophthalmology residency programme at KKESH. A post-residency one- to two-year subspecialty fellowship programme commenced in 1994 by accepting four candidates. Apart from the ongoing clinical assistants programme offered to hospital employees, KKESH has trained several government agency employees, four nursing administrators, four ophthalmic nurses and five ophthalmic operating nurses.

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A total of 63 research projects were completed during the years 1993-1994. The national study on the "Role of primary eye care as an integral part of primary health care" was completed. The Tumor Registry established earlier is in progress. So far, 1926 cases have been registered. As of January 1994, 38 cancer cases have been reported to the National Cancer Registry that was established by the Ministry of Health. A total of 1250 penetrating keratoplasty (PKP) cases have been reviewed under the PKP Registry. This is equivalent to 25% of all PKP cases performed at KKESH.

Maintenance of genetic studies for gene mapping of retinal dystrophies and congenital glaucoma is in progress. Ten field trips to different parts of the Kingdom were made under these projects. Two new registries were developed: (1) the Retinal Dystrophies Study contains 632 cases; and (2) the Congenital Glaucoma Study contains 946 cases.

A new project to assess causes of visual loss in children in Saudi Arabia was approved and initiated. Another comparative project to study glaucoma between family members of glaucoma patients and controls was initiated.

The excimer laser was introduced to KKESH in 1993. Two projects entitled "Excimer laser keratectomy in the treatment of corneal plaque in vernal keratoconjunctivitis" and "Wessely-type immune ring following excimer laser PTK", studying its effects in correcting myopia and treating corneal opacities, were completed and presented in medical meetings.

A controlled masked study to correlate the effect of UV light in the development of CDK in Saudi Arabia was approved.

The Retinoblastoma (Rb) Programme has also been very active during 1993-1994. Eight Rb-related research projects were approved by the Research Council and three projects, entitled "Prognostic significance of angiogenesis in retinoblastoma", "Orbital cellulitis with retinoblastoma" and "Retinoblastoma referral patterns in Saudi Arabia", were completed and submitted to various journals. Two retinoblastoma abstracts as well were submitted to the AVRO 1995 Meeting and one to the American Academy of Ophthalmology 1995 Meeting. Data gathered from the "Retinoblastoma referral patterns in Saudi Arabia" were also utilized in the presentation made at the Saudi Ophthalmological Society Meeting in Riyadh, in 1994.

Brachytherapy for intraocular tumours was implemented for the first time at KKESH with the leadership of the research department. A prospective brachytherapy study was approved by the Research Council.

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INSTITUTE OF OPHTHALMOLOGY TUNIS, TUNISIA

Director: Professor S. Ayed

Despite all the efforts at prevention, blindness continues to be a public health problem in Tunisia.

The blindness prevention activities have been carried out in accordance with the strategy developed by the Ministry of Health (DSSB), in collaboration with WHO and based on the concept of primary eye care and on the integration of visual health activities with all the general health services.

Training and education

A number of public health workshops were organized at the Hédi Rais Institute during the 1993-1994 biennium.

The first of these workshops was held from 11 to 15 January 1993. The participants were 12 public health physicians from all the governorates of Tunisia.

The second public health workshop, confined to paramedical staff, was held from 3 to 5 May 1993; there were again 12 participants from various governorates.

Training was both theoretical and practical. A pre-test and post-test for evaluation purposes showed the good impact of this training.

As part of the fight against disability in general and in collaboration with the Ministry of Social Affairs (Institute for the Advancement of the Handicapped), training courses were provided for future educators and refresher courses were given to serving educators.

There are also training courses designed for fifth-year medical students, who will be the future front-line physicians, and for residents in ophthalmology.

Public education and information were provided through radio talks and interviews with ophthalmologists on two very popular programmes: "The world of light" and "Health for all".

Research

(1) National survey

Initial evaluation in 1978 showed the prevalence of blindness to be 3.8%; it fell to 1.33% in 1989.

A national survey was conducted in the field in 1993. For this purpose, 15 urban clusters and 15 rural clusters, totalling 3981 people, were drawn by lot and examined by two teams, each consisting of one ophthalmologist and one nurse, assisted in their task by a record clerk and a driver.

The preliminary results of this national survey are as follows: the overall prevalence of blindness is 1.18%. Blindness affects men almost as much as women: 1.04% as against 1.3%.

The leading cause of blindness is still cataract. This is found in 66% of cases and the etiology of this blindness is essentially degenerative.

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These are only preliminary results, as the survey data are still being analysed.

(2) *Prevention of blindness due to eye accidents at work*

Eye accidents at work are often responsible for severe visual impairment, or even blindness. It is therefore essential to prevent such accidents in order to reduce the prevalence of blindness.

For this purpose, a thesis is being prepared in the form of a prospective study of the victims of eye accidents at work. The preliminary results are as follows: in 70.5% of cases, the causal agent is a metal object. The prevalence of blindness and severe visual impairment is 13%, and only 5% of the patients were wearing protective equipment.

(3) *Eyesight and driving*

In order to assess the importance of visual function in road safety, 144 patients responsible for road accidents of varying severity were examined. Disorders of refraction were found in 35% of cases. A narrowing of the peripheral visual field was noted in 24% of cases and an impairment of colour vision in 4% of cases.

New measures are being introduced concerning the granting of driving licences.

**MOSCOW HELMHOLTZ RESEARCH INSTITUTE OF OPHTHALMOLOGY
MOSCOW, RUSSIAN FEDERATION**

Director: Professor I. F. Maïtchouk

The activities of the Centre continued to grow during 1993 and 1994, despite increasing budgetary constraints. A workplan for 1994 to 1997 was prepared on activities for the prevention of blindness, with special emphasis on infectious eye diseases.

Training

- (1) Training courses on infectious and allergic eye diseases were conducted: a total of four two-week courses, attended by 180 ophthalmologists from 34 regions.
- (2) Joint residency programme in ophthalmology, three months' training in prevention of blindness, with special emphasis on infectious eye diseases: 24 residents.
- (3) Residency programme to three years' training and research in infectious eye diseases, prevention of blindness and eye health care: seven residents completed the dissertation for the degree of Candidate of Medical Science.
- (4) Training of visitors from individual programmes from New Independent States and from other countries: 12 (Belarus, Uzbekistan, Kazakhstan, Georgia, Tajikistan, Kyrgyzstan, India, Turkey, Syria, Pakistan).

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- (5) Lectures on prevention of blindness and infectious eye diseases for ophthalmologists in Moscow and other regions: 14.
- (6) A seminar on anti-inflammatory and anti-infectious drugs was conducted in Moscow, with 250 ophthalmologists. Preparation for a Symposium on "New ophthalmic drugs" in progress.
- (7) Teaching materials published:
 - Guide to the treatment of chlamydial conjunctivitis with quinolones
 - Guide to the treatment of fungal keratitis
 - Guide to laser and microsurgery in keratitis
 - Guide to the treatment of corneal ulcers

Research

- (1) Epidemiological and clinical research continued in prevention, diagnosis and new methods of treatment of infectious and allergic eye diseases: chlamydial infection, herpesviral eye diseases, adenoviral conjunctivitis, AIDS and the eye, bacterial and fungal infections, vernal conjunctivitis, uveitis. Results were summarized in 29 articles.
- (2) An epidemiological study of corneal ulcers is in progress; the growing role of herpesvirus and fungi is recognized, and new drugs are under trial.
- (3) According to an experimental study and clinical trial, the eye drops of "Leocain", a new anaesthetic developed by Bioeffect Institute, are more effective, less toxic for cornea and less allergic compared to Tetracaine.
- (4) The Centre has initiated new studies on the role of eye infections (even subclinical) in cataract development (enterovirus, herpesvirus, onchocerciasis, trachoma), especially the role of neutrophils which release cationic proteins: myeloperoxidase, defensins, lactoferrin, etc. (Maïtchouk, I., 1994).
- (5) The Centre supported the epidemiological studies on blindness and visual impairment, eye disease prevalence and eye care development in the New Independent States: Uzbekistan, Tajikistan, Kazakhstan.

International activities

- (1) IAPB. The Centre is working in close collaboration with IAPB and participated in the General Assembly, Berlin, May 1994.
- (2) The Centre has initiated national blindness prevention plans and programmes in the following States: Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Russian Federation, Tajikistan, Turkmenistan.
- (3) International Organization Against Trachoma. The Director of the Centre presented the main report on the General Assembly, Paris, May 1993 - "Treatment of trachoma and paratrachoma", published in RIT, 1993 (pp. 17-169) and was awarded the Trachoma Gold Medal, 1993.
- (4) Staff members presented 12 papers at international meetings, including: General Assembly of IOAT, Paris; Symposium on Drug Delivery, Finland; General Assembly of IAPB, Berlin; World Congress on Antibacterial Drugs, Geneva; Conference on Antiglaucoma and Anti-inflammatory Drugs, Germany; International Congress of Ophthalmology, Toronto.

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INTERNATIONAL CENTRE FOR EYE HEALTH
LONDON, UNITED KINGDOM

Director: Professor G. J. Johnson

This biennium, 1993 and 1994, has been a period of consolidation in each of our main areas of activity. An association has been established, for either research or educational activities, with other WHO/PBL collaborating centres in Madurai, Riyadh, Kaduna and Charleston.

Research

Dr Paul Dolin, an epidemiologist with a strong background in cancer research and also in microbiology, joined the Department in 1993.

(1) *Cataract research*

A study on risk factors for cataract in young mothers in India has been completed. Dr Dolin and Professor Johnson were involved with WHO/PBL in a series of workshops on the importance of exposure to solar UV in the causation of eye diseases, and are developing lines of research on cataract etiology.

Dr Darwin Minassian was instrumental in obtaining for the Institute a major grant from the Medical Research Council for a clinical trial of phakoemulsification compared with routine extracapsular cataract surgery. Recruitment of 2000 patients to the CBM-sponsored randomized clinical trial of anterior chamber intraocular lenses in Lahan, Nepal, is nearly complete. The results are expected to be available in mid-1996.

(2) *Childhood blindness research*

Clare Gilbert and Jugnoo Rahi have continued examining children in blind schools on four continents to establish the relative causes of blindness. Michael Eckstein is studying the etiology of congenital cataract, and taking part in clinical trials of different interventions, with colleagues at Aravind Eye Hospital.

(3) *Infectious disease*

Work continues on onchocerciasis and ivermectin distribution in Kaduna and Enugu, in Nigeria; on trachoma in Kenya; and on suppurative keratitis in Accra, Ghana, with Dr Hagan.

(4) *Glaucoma*

Darwin Minassian is a collaborator in trials of intraoperative 5-fluorouracil in primary glaucoma filtration surgery. In Mongolia, a survey with Dr Baasaanhu showed that glaucoma accounted for 33% of blindness in that country, equal to cataract. Further work is starting to characterize this glaucoma.

(5) *Other investigations*

These include the start of a five-year incidence study of blindness in the Masaka district, Uganda, in collaboration with the Medical Research Council.

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Teaching

The introduction of an M.Sc. degree in Community Eye Health, in October 1992, and the restructuring of the courses into modular form were reported to the 1993 PAG meeting. These developments have enabled the Centre to offer a range of courses to suit candidates of different backgrounds and needs, and this is reflected in the numbers now attending the courses:

Course name	1993/4	1994/5
M.Sc. in Community Eye Health	9	10
Diploma in Community Eye Health	6	12
Certificate in Tropical Ophthalmology	4	6
Certificate in Community Eye Health	18	14
Short courses of two weeks	28	30
		(as of Jan. 95)

In 1993, John Wu obtained a Ph.D., Ian Murdoch his M.D. and Sam Powdrill an M.Phil., each at the University of London.

A two-week course on Planning and Management in Eye Care for Latin America now takes place annually in Colombia, organized jointly by ICEH and the PAHO/PBL office.

In December 1994, a Workshop on Childhood Blindness for South-East Asia took place at the Aravind Eye Hospital.

International Resource Centre

A Teaching and Educational Materials Workshop took place in London on 7-9 July 1993, co-sponsored by WHO and ICEH. This has resulted in the report WHO/PBL/94.44.

The *Bulletin* has, with Issue No. 13, changed its name to *The Journal of Community Eye Health*. It is distributed to nearly 20 000 people in 188 countries. An Indian edition will be printed and distributed in India, plus a four-page Indian supplement, in collaboration with DANPCB in New Delhi. This is expected to increase the circulation by a further 5000 copies.

A new book, *Eye Surgery in Hot Climates*, by John Sandford-Smith, has been published jointly by ICEH and the Ulverscroft Foundation, and is distributed by the Resource Centre. The Department has also contributed a section to the new *Oxford Textbook of Surgery*.

Honours

Emeritus Professor Barrie Jones was awarded the International Blindness Prevention Award of the American Academy of Ophthalmology in 1994.

Future prospects

The postgraduate medical schools of the University of London are being restructured. As part of this process, the Institute of Ophthalmology, of which ICEH is a department, will be affiliating and then merging with University College not later than August 1996. The long-term implications for ICEH are not at present clear.

Annex 5**DR RAJENDRA PRASAD CENTRE OF OPHTHALMIC SCIENCES,
ALL INDIA INSTITUTE OF MEDICAL RESEARCH**

Director: Dr P. Prakash

Background

The Dr Rajendra Prasad Centre for Ophthalmic Sciences is designated as the Apex Centre for the National Programme for Control of Blindness in India and has actively participated in strengthening of the Programme by providing technical advice.

The Centre has a 300-bed hospital with six clinical sections looking after 15 subspecialties of ophthalmology. The Centre handles on an average 985 cases daily and performs over 44 operations per day. It has associated departments of ocular radiology and ocular anaesthesiology, and the unique advantage of having basic departments of ocular biochemistry, ocular pathology, ocular microbiology and ocular pharmacology.

It has a nucleus for the section of community ophthalmology which can undertake epidemiological research in operational aspects of avoidable blindness. It also has a mobile ophthalmic unit, statistical unit and personnel to look after the community in rural and urban slums. The Centre is also chosen to coordinate the Overseas Development Agency (UK) Programme in Community Ophthalmology, along with two regional eye institutes in the country, so that ophthalmic education in India can be tailored to the needs of the community. Medical officers in CHC and district ophthalmologists are proposed to be given special orientation to community ophthalmology all over India, as per the module developed at this Centre.

Training

During the year 1993, the Centre provided short-term training in various specialized fields of ophthalmology to 16 ophthalmic surgeons from different medical colleges in the country, including two WHO fellows, and to nine in the year 1994.

The Centre organized three workshops during 1993, in which 111 doctors from different parts of the country participated. Six workshops/symposia were held during 1994, in which 195 doctors from different parts of the country participated, including an update in ophthalmology in collaboration with the Medical Council of India which foreign faculty also joined. Fifteen students were awarded the degree of M.D. (Ophthalmology) during 1993 and 16 in 1994. Six B.Sc. (Hons) in the paramedical training programme were trained in 1993 and five in 1994.

Research

The Centre is engaged in various fields of clinical and basic research in the national context, i.e., cataract, glaucoma, strabismus and binocular vision, ocular infections and diseases of vitreoretina, etc. In 1993, 79 research projects have been completed and continuing. Forty-two scientific and research papers have been published in national and international journals. An International Centre for Chlamydial Research, under an agreement between the Government of India and the Overseas Development Agency (UK), has been established with effect from 1 April 1993 and has started functioning. Advisory services and expertise were provided on request to various national and international organizations, including ICMR, CSIR, etc., as well as referees for various national and international journals. The Centre has been actively involved in the conception and implementation of the project for control of cataract blindness under World Bank Aid, with the Director of the Centre as Adviser Ophthalmology. As a member of the National Blindness Control

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Board constituted by the Government of India (Ministry of Health and Family Welfare), relating to the Cataract Blindness Control Project between the Government of India and the International Development Agency, he is working closely for its implementation. The Centre is the active participant for technical norms to train the trainers for this project. Under the chairmanship of the Director of the Centre, Professor Prem Prakash, the Government of India "technical norms of training of trainers" programme was finalized.

**ARAVIND EYE HOSPITAL &
POSTGRADUATE INSTITUTE OF OPHTHALMOLOGY
MADURAI, INDIA**

Director: Dr G. Venkataswamy

Aravind Eye Hospital was recognized as a WHO Collaborating Centre on 17 February 1992. In the last year, apart from addressing the various points in the terms of reference for the collaboration, Aravind continued to work closely with other WHO collaborating centres in the areas of research and training. Aravind gratefully acknowledges the support from other collaborating centres, especially the National Eye Institute (USA), the International Centre for Eye Health (UK), the Proctor Foundation (USA) and the Dana Center (USA).

Research

- (1) Aravind is carrying out a clinical trial to evaluate the long-term (one year) impact on quality of life, vision function and economic status of ECCE and PC-IOL implantation as compared to the present ICCE method of cataract surgery. In addition, the clinical outcome is also being monitored.
- (2) Aravind, in collaboration with the Proctor Foundation, is planning a study to determine the role of antioxidants in the prevention of cataract formation. The first phase of the study is in progress and the data from this phase will be used for designing an intervention trial.
- (3) In collaboration with the International Centre for Eye Health, London, a research study is in progress to study the causes of blindness in children and to assess the long-term outcome of surgical procedures for cataract in children.
- (4) A population-based comprehensive eye survey is in progress. This study was initiated with the help of Dr Alan Robin, of the Wilmer Institute, Johns Hopkins Hospital, and technical assistance from the Dana Center, Baltimore.
- (5) Aravind Children's Hospital, following the vitamin A study, continues to be the focal point to the national NGOs for vitamin A-related issues.
- (6) Aravind Eye Hospital and the London School of Hygiene and Tropical Medicine are planning a study to investigate "Low utilization of eye services in a rural community in a developing country", using participatory rural appraisal (PRA) methods.
- (7) Aravind Eye Hospital, with support from WHO, proposes to expand its capabilities for cataract services, including patient-centred outcome assessment.

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(8) Mr R. D. Thulasiraj attended two meetings on the effect of UV radiation on the eye, held at WHO headquarters, Geneva, in August 1993 and in March 1994. The gathering reviewed the available evidence linking UV exposure and occurrence of eye diseases.

Service

(1) In 1994, the following eye care services were provided by the Aravind group of hospitals:

	Paying	Free	Total
Total outpatient visits	317 346	400 114	717 460
Cataract and IOL surgeries	20 901	44 328	65 229
Other surgeries	10 682	5 298	15 980
Total surgeries	31 583	49 626	81 209
Total eye camps	-	877	877

(2) Aravind continues to work with the district-, State- and national-level bodies involved with the control of blindness programmes. Dr G. Venkataswamy is a member of the District Blindness Control Society (DBCS), the Steering Committee of Government of Tamilnadu and the National Advisory Board.

Training

(1) A pilot training programme for district programme managers of the DBCS was conducted in March 1994 and this was followed by a curriculum development workshop. The curriculum thus developed forms the basis for similar training in other centres.

(2) Mr R. D. Thulasiraj and a group of senior ophthalmologists of Aravind Eye Hospital participated in the Third Annual Scientific Session for The College of Ophthalmologists of Sri Lanka, from 25 to 27 August 1994. He participated in a panel discussion on increasing the cataract output in Sri Lanka, and ophthalmologists participated in the Training Programme and Symposium.

(3) Lions Aravind Institute of Community Ophthalmology held a curriculum development workshop on 1 and 2 September 1994, for improving the productivity and effectiveness of eye hospitals. This was followed by two training workshops held from 23 to 29 September 1994 and from 15 to 22 December 1994, in which personnel from seven Lions Eye Hospitals were trained.

(4) An eight-week IOL microsurgery training course was started in June 1993, with support from Sight Savers. The training is for exposure to community ophthalmology and hospital management, and also training in microsurgery.

(5) A four-week indirect ophthalmoscopy training course was started in June 1994, with support from Sight Savers International. This training facilitates the diagnosis by ophthalmologists of diseases affecting the retina, which are increasing in both developed and developing countries.

(6) WHO fellow: Dr Abey Singhe from Sri Lanka, 15-19 March 1993; Dr Deep Bahadur Karki and Dr Shekhar Sharma from Nepal, 20-31 December 1993.

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- (7) Training of trainers programme under the World Bank project. The programme for training of trainers in microsurgery and extracapsular cataract extraction with IOL implantation.
- (8) Dr G. Venkataswamy and Dr P. Namperumalsamy participated in the Panel Session on Community Ophthalmology at the International Congress of Ophthalmology Conference in Toronto, Canada, 26-30 June 1994.
- (9) Dr G. Venkataswamy, Mr R. D. Thulasiraj and Dr N. V. Prajna attended the Fifth General Assembly of IAPB, in Berlin, in May 1994.
- (10) Mr R. D. Thulasiraj was invited as part of the faculty to teach the students of the certificate course at ICEH, London.
- (11) Dr G. Natchiar attended the IOL Microsurgery Training Workshop at Bandung, Indonesia, 14-18 December 1994, organized by Helen Keller International, Indonesia.
- (12) Dr P. Namperumalsamy attended the American Academy of Ophthalmology and conducted the instruction course on "Serving the underserved: Combating cataract blindness in the developing countries", in collaboration with the Academy's Instruction Advisory Committee and the Committee on International Ophthalmology.

**DEPARTMENT OF OPHTHALMOLOGY,
UNIVERSITY OF MELBOURNE
VICTORIA, AUSTRALIA**

Director: Professor H. R. Taylor

Training and technical assistance

(1) *Australia*

Specialty vocational training in ophthalmology is provided to registrars in training and to fellows who receive training in subspecialty areas. In the last two years, ophthalmologists from China, Fiji, India and Thailand have received fellowship training in epidemiology, corneal disease, ocular motility and vitreoretinal diseases. Departmental staff supervise postgraduate students undertaking Masters-, M.D.- and Ph.D.-level projects. Short courses on the management of eye disease and practical sessions on eye examination are conducted for general practitioners.

(2) *International*

Training courses in low vision have been conducted in the Pacific region and in East Africa. Selected trainers from nine Pacific countries took part in two courses which included assessment techniques for people with low vision, training others, and the implementation of low vision programmes. The content and procedures for the training courses have been documented and a detailed curriculum for use in developing countries will be compiled based on courses conducted in the Pacific, India and East Africa.

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In collaboration with The Fred Hollows Foundation, members of the Department have assisted in cataract surgeon training courses in Viet Nam and Nepal. Ophthalmologists who have already been trained to do intracapsular cataract surgery, but usually without the use of an operating microscope, are given a two-week intensive course on modern microsurgical extracapsular extraction and intraocular lens cataract surgery. Vietnamese ophthalmologists have been trained as trainers and are continuing to conduct training courses of other Vietnamese ophthalmologists. By the end of 1994, 150 Vietnamese ophthalmologists will have been trained in modern cataract surgery. Additional specialty training courses in glaucoma and vitreoretina have been conducted in both Hanoi and Ho Chi Minh City.

Advice is provided on an ongoing basis to The Fred Hollows Foundation in the development of its prevention of blindness programmes. Specific assistance has been provided with the establishment of intraocular lens factories in Eritrea and Nepal, and with the planned factory in Viet Nam. Assistance has also been provided with surgical training in Viet Nam, the opening of an Eye Bank in Nepal, and the development of national networks for the prevention of blindness.

Research**(1) *Clinical*****(a) Ocular trauma**

A survey of eye injuries treated at the Royal Victorian Eye and Ear Hospital has indicated the spectrum and magnitude of ocular trauma in Australia, and allowed the recognition of high-risk target groups which stand to benefit from community education programmes, improved product safety, modifications of industry standards and enforcement of regulations.

(b) Cataract and macular degeneration

The Centre has commenced a long-term prospective, randomized, double-masked control trial of the use of antioxidant vitamin supplementation to influence the development and progression of cataract and macular degeneration. This study is based on the Centre's previous observations of the potential role of photo-oxidation due to exposure to sunlight. In all, 1500 people will be enrolled and studied for four years.

(c) Glaucoma

Studies of large extended families have revealed a number of pedigrees with phenotypically distinct hereditary primary open-angle glaucoma. Linkage studies have been initiated and the Centre hopes to proceed to the molecular genetic characterization of these families.

(d) Excimer laser surgery

A prospective evaluation of excimer laser surgery for myopia, astigmatism and therapeutic surgery has continued. New techniques for excimer laser glaucoma surgery and lamellar keratoplasty have been evaluated.

(e) Pterygium

A prospective, randomized trial is under way to compare the safety and efficacy of four alternative forms of pterygium surgery: simple excision with base scleral closure alone, or this supplemented with beta-irradiation, mitomycin, or conjunctival transplant.

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(2) *Laboratory studies*

(a) Corneal healing

Work is directed towards identifying, isolating and cell-culturing human and rabbit corneal limbal stem cells *in vitro*. While the origin of regenerative epithelium is the limbus, little is known about the actual cells responsible. Once characterized, more effective ways of covering or repairing severe, chronic or recurrent epithelial defects can be developed.

(b) Diabetic retinopathy

Laboratory-based studies of retinal basement membrane changes in a rat model have assessed the effect of antioxidant and antiglycation agents, and have compared and contrasted retinal and renal effects.

(c) Eye banking

The Lions Eye Bank-Melbourne was opened in 1991. In addition to distributing approximately 300 corneas over the last two years, it conducts operational research, including a review of microbiology of donor tissue and of graft outcome. Corneas were also distributed overseas to help promote eye banking, including Nepal and Viet Nam.

(3) *Epidemiology*

The major project of the Epidemiology Research Unit is the Melbourne Visual Impairment Project (Melbourne VIP). This population-based study of 3300 people over 40 years will give the distribution and determinants of eye disease, as well as an assessment of the access and adequacy of available eye health services.

The protocol for the community-based ascertainment of eye disease developed by the Unit has been used to initiate studies in India and, hopefully, China. Further studies following the protocol are being considered in England, Brazil and France. The opportunity to have comparable data from such varying populations is very exciting.

Epidemiological studies of diabetic retinopathy have shown the under-utilization of regular retinopathy screening in Australians with diabetes, and several outreach or community-based approaches to be evaluated. Technical assistance has been provided to assessments of the impact of diabetes in Mauritius, Nauru and Western Samoa.

Technology development

(1) *Low vision*

A Low Vision Kit has been developed for use in developing countries to identify people with low vision and assess their needs for treatment and/or rehabilitation. The Kit contains simple tests of near and distance vision, a pinhole mask and booklets of instructions which aim to give an understanding of the needs of people with low vision. The Kit is translated and distributed by WHO.

(2) *Instrumentation for cataract surgery*

MUDO loupes have been developed that are lightweight, high-powered (5x), spectacle-mounted operating loupes that provide coaxial illumination. They can be used for IOL surgery as an alternative for an operating microscope. These low-cost loupes should be available early in 1995.

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A suite of tools to manufacture low-cost microsurgical needles has been developed. Prototype needles have been trialed in a number of developing countries. The Centre now aims to make these low-cost suites of tools commercially available and to have a production line in place by the end of 1995.

The development of low-cost YAG lasers for use in developing countries is being investigated, with both an Australian and a Russian group. Prototype lasers will be field-tested in 1995.

Meetings

(1) *Viet Nam*

The Centre and The Fred Hollows Foundation have convened two annual meetings of international NGOs and Vietnamese ophthalmologists for the coordination and development of a comprehensive national plan for the prevention of blindness in Viet Nam. The third meeting is scheduled for March 1995. This programme was concentrating initially on the delivery of cataract surgery services, but this is linked to the development of primary eye care programmes and is to be integrated with the primary health service.

(2) *Manufacture of IOLs in developing countries*

The Collaborating Centre convened an informal meeting in May 1994 in Melbourne, on behalf of WHO/PBL and The Fred Hollows Foundation, to review the criteria for intraocular lenses manufactured by non-profit organizations in developing countries. A report of the meeting is available through PBL.

(3) *Informal meetings of Australian NGOs*

An informal quarterly meeting of local NGOs interested in prevention of blindness, either nationally or internationally, is held within the Collaborating Centre. The group discusses areas of mutual interest and provides a forum to inform members of development and areas of potential collaboration.

Future perspectives

Analysis from the Melbourne VIP will assist in defining areas for future public health and research intervention. Public health education campaigns will be initiated in an effort to reduce the incidence of preventable blindness.

Vision-testing materials and procedures are being developed for vision screening in underserved groups in Australia. Primary health carers will be trained to use screening tests and devices.

Diabetic retinopathy remains a leading cause of blindness in Australia. We plan to use proven new technology to screen large numbers of patients with diabetes in rural areas who have poor access to eye services.

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**BEIJING INSTITUTE OF OPHTHALMOLOGY
BEIJING, PEOPLE'S REPUBLIC OF CHINA**

Director: Dr Shi-yuan Zhang

In accordance with the terms of reference entrusted by WHO to the Centre in China, the tasks for the promotion and coordination of national efforts for the prevention of blindness were continued. The main activities of training and research in the field of blindness prevention of the Centre were as follows:

(1) The Sixth General Meeting of the National Committee for the Prevention of Blindness was convened on 5 October 1993 in Xuzhou City, Jiangsu Province:

- (a) to review the national undertaking of blindness prevention during the past four years;
- (b) to decide on continuation of cataract operations for restoration of sight;
- (c) to discuss modifications of criteria for the nomination of Advanced County of Blindness Prevention; and
- (d) to ratify the nomination of four new Advanced Counties of Blindness Prevention.

Over 60 persons participated in the meeting.

(2) Cataract is the leading cause of blindness in China. Surgical treatment of cataract remains the key point for blindness prevention in the country. Since 1988, an average of 180 000 cataract operations have been performed per year. By the end of 1994, 1 010 000 cataract operations had been performed all over the country. Among those cases operated, about 10% were IOL implantation. In coming years, in the whole country, 20% to 30% IOL implantation in cataract surgery will be expected to be performed.

(3) A national workshop on cataract epidemiology was conducted in the Centre in October 1994; participants came from five provinces of the country. As a result of the workshop, a research plan on incidence of cataract was worked out; it will last from 1994 until 1998.

(4) The Director of the Beijing Centre took part in drafting the National Rehabilitation Programme for Disabled Persons, including the rehabilitation of the visually disabled, the continued promotion of cataract operations, and IOL implantation for optimal restoration of sight.

(5) Training courses on primary eye care, blindness and low vision were conducted in June, October and November 1993, respectively.

(6) The Tong Ren Eye Bank received 287 donated eyeballs, and 276 cases of keratoplasty were performed in 1994.

(7) Research work in the Centre includes early diagnosis of glaucoma with the optic nerve head computerized image analysis, prospective study of treatment of age-related early cataract using Chinese herbs and organic selenium, and treatment of viral keratitis.

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**DEPARTMENT OF OPHTHALMOLOGY,
JUNTENDO UNIVERSITY SCHOOL OF MEDICINE
TOKYO, JAPAN**

Director: Dr A. Kanai

The Centre has played a regional role for a long time in promoting blindness prevention. This covers three areas: training of eye professionals, research promotion, and collaboration with neighbouring countries. The major activities undertaken in 1993 are as follows:

Training of eye professionals

The Centre continued to provide foreign visitors with training opportunities in Japan concerning blindness prevention, under various grants. This included Chinese ophthalmologists and trainees from Viet Nam and Laos, who spent six weeks in the National Centre for Rehabilitation of the Disabled, Tokorosawa.

There were two research fellows from the Philippines and Brazil, supported by the Ministry of Education. They joined the study group of ocular molecular biology.

One of the Centre's activities was promotion of low vision aids among practising ophthalmologists and the development of service networks. Jointly with the Japanese Ophthalmologists Association, the Centre repeated a new annual course. The course has now become a regular national course of the National Centre for Rehabilitation of the Disabled, under the Centre's coordination. The above course also attracted neighbouring countries such as China and Korea.

The Centre continued to respond to various medical institutions and their requests for lecturing on blindness prevention. The annual conference of clinical ophthalmology this year invited the staff of the Centre to deliver a special lecture on prevention of blindness. The Centre also joined the faculty of the National Medical Centre in training professionals for overseas work.

Overseas cooperation

The Centre continued to work very closely with the Beijing Collaborating Centre in assisting its activities related to national programmes. On its request, the staff from the Centre participated in two workshops in China in 1993: the WHO Workshop on Eye Care for the Elderly, held in Xuzhou in October, and the Fifth Conference of the Eastern China Group, which met at Xiamen in November.

Apart from the above, the Centre continued to send its staff to overseas courses such as the London course on Community Ophthalmology, and courses in Thailand.

In 1993, there were three important regional conferences in which the Centre was actively involved in organizing special sessions on blindness prevention. These were the 14th Asia-Pacific Congress of Ophthalmology, in Dhaka in January, and the First Japan-Thai Joint Meeting of Ophthalmology, in Bangkok the same month. The Japan-Filipino meetings still continue, and the last meeting was held in Manila in early December 1994. These meetings always include special sessions discussing blindness prevention.

The Centre continued to be involved in the Lions SightFirst initiative at various levels. It participated in a consultative group and, in addition, played a technical advisory role at the operational

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level in Japan, Laos, Thailand, Viet Nam and Myanmar. Presently assisting the Thai Lions Clubs, a plan of technical cooperation among developing countries (TCDC) is being developed.

Jointly with the Melbourne Collaborating Centre, the Centre organized the first meeting of NGOs in Hanoi in May 1994. The objectives of such a meeting were to provide opportunities for exchanging information.

The WHO Workshop on Training of Mid-level Personnel for Prevention of Blindness

The Centre was the chief organizer of the WHO workshop held at Utsunomiya from 27 September to 1 October 1993. As requested by the Member States of the Western Pacific Region which met in Sydney in October 1992, it discussed the training of mid-level personnel mobilized for blindness prevention. The workshop concluded that another gathering was needed to discuss a policy/strategy basis as well as a regional model of curriculum.

The Centre raised the funds needed in Japan and invited the Member States in the northern subregion of the Western Pacific. Taking note of geographical and cultural similarity and successful manpower plans of Indonesia, Nepal and Thailand, these countries were specially invited from the South-East Asia Region. As a result, the workshop was conducted as a bi-regional workshop. It requested a task force to work out a desirable regional training model.

The SightFirst Regional Course (the Regions of South-East Asia and the Western Pacific) on Prevention of Blindness and Eye Care Management

The course was hosted by the Ministry of Public Health of Thailand. The training site selected was the Institute of Public Health Ophthalmology, Maharat Nakhorn Ratchasima Regional Hospital. The course was conducted from 15 November to 9 December 1993.

This was the second course, with the same objectives as the previous one held in 1990 with funds provided by the Centre.

The new course was funded by the Lions SightFirst Project as the first activity of the Thai Lions Clubs. Most preparations were made in the Centre, including curriculum development and a search of faculty. There were 31 participants from 12 countries in the two regions. However, China was given eight fellowships compared to the rest, who sent two to three each. This will hopefully result in a course in China, which will adopt a new method of active learning style.

Research promotion

The Centre has long been very close to the Thai programme. Responding to a new blindness survey planned next year in Thailand, the Centre extended its technical cooperation in many aspects again. Eventually, a detailed plan was finalized in the annual meeting of blindness prevention staff of the Ministry in late December. It is expected that the survey will demonstrate that blindness prevalence has been reduced to less than 0.5%.

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