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Regional Low Vision Workshop

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CONTENTS

	Page
INTRODUCTION	1
1. LOW VISION: INTERNATIONAL AND REGIONAL PERSPECTIVES	1
2. PROGRAMME PRIORITIES IN LOW VISION CARE	2
2.1 The role of the World Health Organization	2
2.2 The role of international nongovernmental organizations (INGOs)	2
3. LOW VISION: SERVICE DELIVERY MODELS	4
3.1 Service delivery models of low vision in developed countries	4
3.2 Service delivery models of low vision in developing countries	5
3.3 Requirements for setting up a low vision service for a population of 10 million	7
3.4 Low-cost low vision devices	9
4. LOW VISION ORIENTATION	10
4.1 What is a low vision service?	10
4.2 What is a low vision clinic?	11
4.3 What is low vision assessment?	12
4.4 Prescribing LVDs	12
4.5 Instruction and training in the use of LVDs	14
5. THE STATUS AND SITUATION OF LOW VISION SERVICES IN DIFFERENT COUNTRIES	15
5.1 Eastern Mediterranean Region	15
5.2 South-East Asia Region	16
5.3 Western Pacific Region	21
CONCLUSIONS AND RECOMMENDATIONS	29

Proposed Regional Action Plan on low vision services as an integral part of VISION 2020 – The Right to Sight	31
Matrix indicating INGO presence in Asia Pacific	33
Annex 1: List of participants	34
Annex 2: Agenda	38
Annex 3: Welcome message by Dr Serge Resnikoff.....	39
Annex 4: Address by Dr Hannah Faal	40
Annex 5: Establishing a low vision service for 10 million people	42
Annex 6: Country profile summary	49
Annex 7: Low vision services development action plan – Country matrix.....	55

INTRODUCTION

An Asia Pacific Regional Low Vision Workshop was convened from 28 to 30 May 2001 in Hong Kong, hosted by the Hong Kong Society for the Blind (HKSB) and with support from the Task Force of the Partnership Committee to the WHO Programme for the Prevention of Blindness. The participants included experts and representatives of several nongovernmental organizations and 22 countries working in the field of low vision care. The list of participants is included in Annex 1.

Mr Clive Oxley (Chairman of the Asian Foundation for the Prevention of Blindness (AFPB)) welcomed the participants on behalf of HKSB, while Dr Susan Chan (Deputy Director of Hospital Authority of Hong Kong) recognized the central role HKSB had played in promoting low vision care in Hong Kong. Mrs Grace Chan (Director of HKSB) extended her vote of thanks to all participants and sponsors of the meeting.

Dr R. Pararajasegaram, Ms Janet Silver and Dr Björn Thylefors were elected Co-Chairpersons. Dr Haroon Awan, Dr Jill Keefe and Ms Karin Van Dijk were appointed Rapporteurs.

The draft agenda was adopted with minor modifications (Annex 2).

1. LOW VISION: INTERNATIONAL AND REGIONAL PERSPECTIVES

Dr Björn Thylefors (past Director of the WHO Programme for the Prevention of Blindness and Deafness) emphasized the need to provide comprehensive low vision services to the many millions of persons in the developing world who are underserved in this respect.

Dr Serge Resnikoff (Coordinator of the WHO Programme for the Prevention of Blindness and Deafness) highlighted the work done by WHO in holding three international meetings on low vision (Brussels, 1981; Bangkok, 1992; Madrid, 1996) that have served as milestones in the development of low vision services. He stressed the importance of low vision as enshrined in VISION 2020 – The Right to Sight. Dr R. Pararajasegaram, Global Coordinator of VISION 2020 – The Right to Sight, gave an overview of the VISION 2020 Global Initiative and the importance of low vision with respect to its magnitude and to the need to incorporate and initiate refractive error and low vision components in national eye care plans. Dr Hannah Faal, President of the International Agency for the Prevention of Blindness (IAPB), spoke on the global, regional and national roles that IAPB coordination groups could play to support low vision initiatives and stressed the need for a comprehensive approach to the problem of refractive errors and low vision.

Mr Subhash Detrange (Member, Executive Committee of the World Blind Union (WBU)) stated that WBU regarded low vision as a priority concern. He added that the 110 million persons with low vision globally were a marginalized group who also had a right to appropriate rehabilitation services. There was a growing and uneasy realization of the unmet needs of this group among many professionals. Several countries had therefore recognized low vision as an independent category of disability and had developed elaborate rehabilitation plans accordingly, with specific allocation of resources. WHO had recently evolved a uniform definition of low vision, removing many doubts and confusion among eye care personnel and service providers. He stated that WBU urged all agencies and rehabilitation workers, as well as Member States worldwide, to formulate appropriate policies, set up necessary infrastructure and establish need-based low vision services in different regions, within a fixed time frame. In conclusion, he said that WBU fully shared the perception and concept of VISION 2020 – The Right to Sight and wished to be a partner in achieving these objectives.

Professor Mohammed Daud Khan (Immediate Past President of the Asia Pacific Academy of Ophthalmology (APAO)) stressed that the Asia Pacific region was confronted with many challenges and opportunities and that low vision presented a unique opportunity of sharing experience across borders and for cross-learning. He emphasized that there was a need to incorporate low vision and rehabilitation in national eye care plans, extended to the district level which served as the basic population unit for a comprehensive eye care programme.

Mrs Grace Chan presented a report on the activities of AFPB. AFPB was founded in February 1981, at that time as part of the global efforts initiated by the late Sir John Wilson to combat blinding eye diseases. It was clear from the beginning that it was impossible for one organization to tackle the problem of blindness in Asia. The direction of AFPB had been to cooperate with organizations and movements on prevention of blindness, and local organizations serving the visually impaired in the Asian region, in launching relevant programmes and projects both within China and in other countries in the Asia Pacific. In these projects, AFPB had often served as a bridge between the funding source and the project, consultant, facilitator and evaluator. The major thrusts included human resource development, construction of rehabilitation and training centres, eye disease education, prevention and treatment programmes, and a vitamin A deficiency programme. AFPB also contributed financially to the Low Vision Workshop held in Madrid in 1996.

2. PROGRAMME PRIORITIES IN LOW VISION CARE

2.1 The role of the World Health Organization

The provision of care to enhance the functioning of persons with incurable visual loss, but with residual vision, has been a concern of the Organization since its early days. In 1981, a WHO meeting entitled "The use of residual vision by visually disabled persons" was organized in Brussels by the WHO Regional Office for Europe. One of the issues addressed by this meeting was the definition of low vision. In subsequent meetings held in Bangkok and Madrid, under the auspices of WHO and with the participation of IAPB and international nongovernmental organizations, this issue was reconsidered, and the following definition was adopted with certain caveats:

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

Although distance visual acuity is included in the definition in keeping with the existing *International Classification of Diseases*, the issue of near vision becomes included when the "execution of a task" includes near work.

WHO, in concert with IAPB, has stressed the need to make eye care services as comprehensive and sustainable as possible and also to adopt appropriate technology that is scientifically sound, acceptable to people, available and affordable. This principle is as applicable to low vision care as it is to other aspects of comprehensive eye care.

2.2 The role of international nongovernmental organizations (INGOs)

Christoffel-Blindenmission (CBM)

CBM, although primarily more known for its work related to blindness and visual impairment, also undertakes a significant amount of work concerning other disabilities such as hearing impairment, orthopaedics, cerebral palsy and other areas.

CBM supports work in low vision and community-based rehabilitation (CBR) in several countries in Asia and accords special importance to developing services for children. CBM has contributed significantly in the pioneering and development of low-cost low vision devices (LVDs). Local partner organizations in cooperation with CBM are developing a variety of low vision services. CBM emphasis is on supporting the development of low vision care in existing programmes, planning and developing operational research, early identification of low vision, training of eye care, education and rehabilitation personnel, and the use of local material resources.

Sight Savers International (SSI)

SSI is involved in supporting different low vision initiatives around the world. These vary from support to small programmes to supporting the full component of low vision care in the national programme for prevention of blindness.

The main thrust of SSI's support to low vision programmes is in the identification and awareness-raising of key personnel; training programmes for low vision personnel – supporting the development of training programmes and also supporting the personnel undertaking courses and after training; identification of primary beneficiaries through screening programmes; development of assessment materials; local production of LVDs and materials; research and development in low vision; promotion of networking, cooperation and coordination between relevant agencies; and evaluation of low vision programmes.

International Council for the Education of the Visually Impaired (ICEVI)

ICEVI is a nongovernmental, nonsectarian organization founded in 1952. ICEVI serves as the “voice” of educators of blind and low vision children throughout the world and, currently, has approximately 4000 individual and organization members in 155 countries. The Council has consultative status with UNICEF, UNESCO and the United Nations Economic and Social Council, working also in close collaboration with WHO through the Partnership Committee of Nongovernmental Organizations working in Blindness Prevention, Education and Rehabilitation. The ICEVI President currently serves as the Chairperson of the Partnership Committee Working Group on Education and Rehabilitation.

The mission of ICEVI is to equalize educational opportunity for blind and low vision children throughout the world. The organization is regionally based, with active programmes in eight regions of the world.

Pan American Health Organization (PAHO)

In 1994, PAHO supported a regional low vision workshop in Colombia in which the main conclusions were the paucity of available data on low vision, the differing causes of low vision within South America and the high prevalence of toxoplasmosis in children. As a result of this workshop, a Pan American Society for Low Vision was founded in 1995, partly sponsored by PAHO. The main aim of this Society was to promote low vision care policy in Latin America. By 1995, 29% of Latin American countries had vision rehabilitation services and, in 1997, PAHO had elaborated a document concerning regional policies and problems affecting services for low vision medical care.

PAHO has been instrumental in helping to formulate a regional eye care policy on low vision that is incorporated in health service development, human resource development and public education and awareness programmes.

Lighthouse International

Lighthouse International is a worldwide resource on vision impairment and vision rehabilitation. Through its work in vision rehabilitation services, education, research and advocacy, Lighthouse International enables people of all ages who are blind or partially sighted to lead independent and productive lives. Founded in 1905 and headquartered in New York, Lighthouse is a not-for-profit organization and depends on the support of individuals, foundations and corporations. Lighthouse has been providing professional training through its Continuing Education Program since 1975. It has had over 12 000 students from more than 70 countries.

In order to nurture professional expertise in low vision care, Lighthouse International is partnering with vision professionals and clinics around the world to create centres of excellence. These local training hubs are designed to provide low vision clinical care and vision rehabilitation services to those in need – particularly in developing countries where care is especially lacking. In addition to expanding dramatically the provision of these critical services, centres of excellence actively promote public awareness issues on behalf of the regional populations they serve.

International Eye Foundation (IEF)

IEF is a supporting member of VISION 2020 – The Right to Sight and has four main areas in which it operates. These include expanding eye care services for those in need; supporting programmes targeting avoidable blindness; providing affordable ophthalmic supplies, equipment and medicines; and enhancing the self-sufficiency of eye care providers in offering quality eye care services.

IEF has set as its programme priorities for low vision the need for services to be comprehensive, of a high quality and with improved efficiency and management, thus reducing overall cost and enabling access to visual devices and low vision care at affordable cost. IEF's main support to low vision programmes is in India and Philippines.

Helen Keller Worldwide (HKI)

HKI supports blindness prevention programmes as well as community-based activities with blind adults and children. The agency currently supports several programmes for prevention of blindness, integrated education, low vision care and CBR in several countries in Asia Pacific. Programme activities include promoting awareness of the importance of identification, assessment and support for children with low vision and for their families and ways to address this need. In some HKI programmes, there is a natural entry point for expansion into the management of children with low vision, i.e., programmes designed to screen for and treat vitamin A deficiency. HKI has expressed an interest further to promote the development of low vision programmes and the education of visually impaired children.

Recommendations

Service delivery: Low vision care must be an integral part of health, education and rehabilitation services provided; it should be a clearly defined activity at primary, intermediary and tertiary levels of health care in each country. Particularly for children, wherever feasible, low vision services should be part of special/integrated/inclusive education and school health programmes.

Each country should include in its national programme planning for VISION 2020 a proper component of low vision care in parallel with the development of refractive error services, providing the services needed at an affordable cost by means of appropriate technology and aiming to reach all those in need.

Low vision services are presently offered by the eye care, education and rehabilitation sectors. It is recommended that networking of these different service providers should be encouraged within each country to ensure optimum and efficient utilization of existing resources.

Advocacy: Lack of awareness about low vision care is a common constraint, amongst both health personnel and the public. It is therefore recommended that suitable material be developed for awareness campaigns; this could be taken on (i) by APAO for ophthalmologists, (ii) by corresponding professional bodies for other eye care personnel, and (iii) by one or several institutions in the region for public education, with input also from interested NGOs.

3. LOW VISION: SERVICE DELIVERY MODELS

3.1 Service delivery models of low vision in developed countries

In 1908, in London, the first school for the partially sighted (myopic children) was established. This was followed by the establishment of a chain of such sight-saving schools in Britain from 1910 to 1920. In 1913, sight conservation classes started in USA. The first large-print book was published as early as 1914. Unfortunately, there was no progress in the field of low vision from 1920 to 1950 but, in 1953, Gerald Fonda established the first low vision clinic in New York. The sight conservation movement met its demise at least in USA.

In 1958, the first low vision clinic in Scandinavia was established in Denmark. During the 1960s, much work was done on the teaching of low vision children to use residual vision by Natalie Baraga. Scandinavia and especially Sweden took the lead in the decade 1970-1980 by promoting the concept of systematic low vision training introduced by Linstedt-Gertzand.

Since the establishment of the first clinic, low vision has become a specialized area of intervention, and most of the developed countries have established models of low vision rehabilitation; a vast range of LVDs and innovative training programmes is available for the visually impaired.

Nationally and internationally, low vision service delivery systems reflect a wide spectrum of options. Low vision services are practised in hospitals, community clinics, colleges of optometry, centres for the blind and visually impaired, health centres, educational facilities, preschool programmes and homes for the elderly. Services of varying quality and scope are often dependent on the initiative of low vision advocates (parent, teacher or ophthalmologist). In some instances, they receive the support of local and/or central government or large NGOs.

Low vision advocates in Australia have been especially aggressive in promoting the establishment of public and private low vision services, backed by major government funds through Medicare and other programmes.

In Canada, at the Canadian National Institute for the Blind (CNIB), vision rehabilitation workers become approved authorizers for designated devices within the provincial assistive devices programme (ADP) within the Ministry of Health.

Scandinavia has in place a comprehensive service delivery system. The recognition of the importance of careful visual assessment, instruction in vision training, use of optical and non-optical devices and electronic devices, together with a wealth of social service funds, has allowed the Scandinavians to provide good-quality services to the visually impaired.

In Spain, any member of the National Organization for the Blind in Spain (ONCE) who has low vision may apply for low vision services. They are free of charge, and optical and/or electronic aids and devices are sold at cost or may be subsidized up to 50% by ONCE. In the United Kingdom, low vision services are delivered through established low vision clinics in different departments of ophthalmology, and assistive devices are loaned to the client, the costs being met by the National Health Service (NHS).

3.2 Service delivery models of low vision in developing countries

In a review of the current status of low vision services in about 20 developing countries in Asia Pacific, five patterns of service seemed to emerge. These include the following:

- (1) Hospital-based
- (2) Special school-based
- (3) University-based
- (4) NGO-based
- (5) Independent

Each is led from a different position, but most do seem now to recognize the necessity for a multidisciplinary approach and interaction with other specialists and subspecialists.

It is useful to think of low vision services as prefabricated buildings that must be assembled before they can be used. They may be assembled in different ways or in a different order and then decorated to suit local custom, taste or fashion; but unless certain essential facilities are incorporated, a comfortable and user-friendly structure will not be created.

(1) Hospital-based

There are good data on this type of service from Brazil, India, Kenya and Pakistan. Most often the hospital offers a low vision clinic as one of a wide range of ophthalmological services. Low vision assessment is usually performed by optometrists who have developed this interest. This type of service has the advantage of good refraction, with medical and surgical support available, but appropriate spectacle-dispensing is often not part of the hospital management structure. When contracted out, spectacles may be beyond the financial reach of a family.

Some hospitals operate outreach services, and low vision aids may be included. Such arrangements may follow the pattern of an “expert centre” which provides problem management, staff training, research, quality control, statistics, etc., and supports peripheral or outreach services, as originally presented in a paper at the IAPB meeting in Berlin in 1994.

(2) Special school-based

Visually impaired children are an obvious starting point of preference. Schools for visually impaired children allow the efficient use of practitioner time, and there are often, but by no means always, good ophthalmological data available. The proportion of children who can be offered LVDs is limited to some extent by the range of powers available to the practitioner. Some schools in Africa are a considerable distance from the service base and are visited relatively infrequently, so there may be a delay between diagnosis and low vision assessment, or between the prescription and the actual supply of spectacles or devices. School-based services do not meet the needs of adult or elderly patients. There are examples of this type of service in Malawi and Zimbabwe. The original discipline of the low vision practitioner may be ophthalmology, optometry, orthoptics, dispensing optics, nursing or teaching.

(3) University-based

Where there are schools of optometry, they are sometimes associated with medical schools. There are useful facilities of this type in Ghana and Malaysia. A disadvantage is that they are inevitably placed in major conurbations and may demand long journeys for patients. However, like hospital-based services, the needs of adult or elderly patients can also be met. They may be government-funded and normally reflect local needs. Some also run outreach and training services for professionals and would be considered to be “expert centres”.

(4) NGO-based

Increasingly common under the VISION 2020 Initiative, these services are based on an NGO regional/country or even local office. They almost invariably cooperate with other services offered by the NGO in that country. Services are usually available from “base” and also on a peripatetic basis. Many schools for visually impaired children are NGO-funded, and good communications therefore exist between the school staff and the visiting low vision practitioners. There is an overlap between type (2) and type (4) services, although NGO-type practitioners are seldom ophthalmologists or optometrists.

Workshops have also been established, often NGO-funded, to produce simple LVDs locally, as originally developed by Peter Spoerer (who was originally a dispensing optician), of CBM in Nairobi. While not as yet satisfying international standards, such devices have the overriding advantage of ready availability and low cost. Such activities are continuing in Nairobi, but are also notable in Pakistan and Nigeria.

(5) Independent

In large cities, it is sometimes possible to find an individual optometrist or dispensing optician who provides LVDs, nearly always as a sideline to his main activities. In most cases, the practitioner has one of the recognized kits such as Keeler or Zeiss, supplies mainly their equipment and works mainly to their methodology. Such services are consumer-funded and are financially out of the reach of all except a privileged few. Such services do not include any sort of structured follow-up, quality control, or a comprehensive link with other associated services such as mobility training or activities of daily living (ADL).

Services of types (1)-(4) usually have follow-up procedures; most either incorporate other services such as mobility and ADL, or have close contacts with other service providers. Many are offering counselling to the subject and/or his family. Most, if not all, usually offer some form of instruction or training in the use of LVDs. In order to make low vision care available at the primary-secondary level, which would enable simple low vision problems to be dealt with adequately, a “first aid” or “instant aid” kit of LVDs and spectacles would have to be developed and made available.

3.3 Requirements for setting up a low vision service for a population of 10 million

Low vision is a part of the spectrum of vision impairment, and low vision services should thus not be separate from services to people who are blind. Essentially, the same people and the same organizations will provide care. Similarly, in the provision of eye care, low vision is part of that care, utilizing the same personnel (with training in low vision) and often using the same facilities. It is only logical to consider that low vision services should be integrated into eye and health care, education and rehabilitation systems within a country. It is also important for each country to estimate the type and quantity of services needed to establish or enhance integrated low vision services within that country.

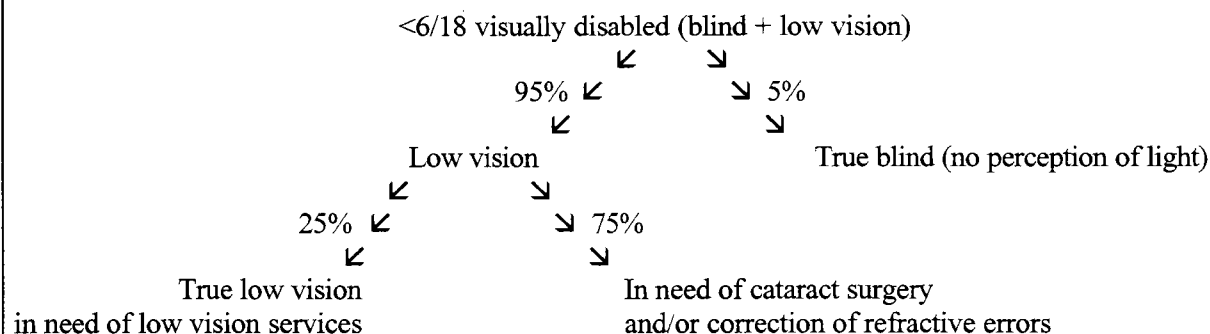
Prevalence of low vision

The number, distribution and need for services can be calculated from the prevalence of low vision. Population-based epidemiological surveys provide data on the prevalence and causes of vision impairment in a defined population. Findings from the Vision Impairment Project (VIP) in Australia have shown that the best corrected visual acuity is the preferred indicator to estimate the number of people in need of low vision care. The number of children with low vision can be calculated using the figures from “Preventing blindness in children” (WHO/PBL/00.77) that reports the estimated prevalence as:

- 0.4 per 1000 children in high-income regions
- 0.7 per 1000 children in middle-income regions
- 0.9 per 1000 children in low-income regions

Life expectancy data are also useful to estimate the number of elderly who are likely to suffer from vision-impairing, age-related macular degeneration and glaucoma, and thus require low vision care. The WHO document “Global data on blindness: Update 1994” suggests that a factor of three times the prevalence of blindness can be used to estimate the prevalence of low vision. However, this may vary from two to seven times.

Estimating low vision care needs



As illustrated in the WHO report “Low vision care for the elderly” (WHO/PBL/96.57), the number of true low vision persons requiring low vision services is about 25% of all those with less than 6/18 visual acuity. This provides a useful basis on which to plan a low vision service. However, it must be added that not all people with low vision will need low vision services, nor will they need the same type and intensity of service.

Estimating numbers in need of low vision services

25% principle: This implies that, for a population of one million with a prevalence of blindness of 1% (<3/60), the number of blind would be 10 000. By estimates, the number with low vision would be about three times this number, i.e., 30 000. The number of blind plus low vision (<6/18) would therefore be 40 000. Of these, 5% or 800 persons would be the true blind and 95% or 39 200 would have low vision. Of these 39 200 persons, 25% or 9800 would be those with true low vision.

95% principle: For practical purposes and ease of calculation (where the prevalence of low vision is not known), the population in need of low vision services is approximately 95% of the number that are “blind” (corrected visual acuity in the better eye of <3/60). In instances where the prevalence of blindness and that of low vision are known – add the numbers of blind and low vision, subtract 5% to deduct the true blind and, from the figure that remains (95%), multiply by 25% to determine the number in need of low vision services.

Low vision services

The integration of low vision care into eye care, education and rehabilitation systems is the key to its success. The comprehensive range of activities in each of the levels of care is shown in the table below.

Level of care	Activities	Personnel
Primary Community-based	Awareness Screening Referral Basic rehabilitation	Primary health care (PHC) / primary eye care (PEC) Community-based rehabilitation (CBR) Teachers
Secondary	Diagnosis and treatment Refraction Low vision assessment Prescription of LVDs and training	Ophthalmologist Ophthalmic medical assistant (OMA) Optometrist Orthoptist Multiskilled worker
Tertiary	Diagnosis and treatment Low vision assessment Prescription of high-power and complex LVDs and skills training Referral and consultation with other professionals Training of health, eye care, education and rehabilitation workers	Ophthalmologist Optometrist Orthoptist Teacher Rehabilitation specialists (e.g. orientation and mobility)

Ideally, a low vision programme will include all levels of care so that a comprehensive range of services is available to all, irrespective of barriers to access. In some countries, low vision care can commence with the establishment of clinics and services at the tertiary level. Alternatively, a service may start at primary and secondary levels with case-finding and parallel establishment of regional clinics and service centres. A critical feature is the combination of outreach (community-based) services and clinical care.

The decision on where to start will depend on priorities for care such as coverage, facilities and strengths in the health, education and rehabilitation systems.

It is estimated that one tertiary centre could cater for a population of 10 million people. Associated with this would be four regional (secondary) centres. Current understanding and experience suggest that, of all true low vision persons in need of low vision services, 30% can be effectively dealt with at the primary level and 50% can be managed at the secondary level, while 20% would need tertiary-level care. Very young children and those with multiple disabilities are likely to require tertiary services.

3.4 Low-cost low vision devices

In 1981, WHO held its first meeting on the use of residual vision. It produced recommendations and definitions for practice and service in the field of low vision. Since then, there have been a number of developments. New resource materials have been produced for training, and there is an increase in the manufacture of assistive devices for the visually handicapped. The challenge is to identify ways to enable partially sighted people to benefit from their remaining vision through the provision of appropriate services, materials and devices.

Assistive devices for the visually impaired

These can be broadly divided into devices for the blind and devices for the partially sighted, with an overlap in quite a few cases. According to the design and function, LVDs can be broadly distributed into three categories:

- (1) Optical
- (2) Non-optical
- (3) Electronic

Optical devices consist of one or more lenses placed between the eye and the object to be viewed, which increases the size of the image on the retina. Non-optical devices do not involve lenses or mirrors – they are devices that alter environmental causes through the use of illumination, contrast and spatial relationships. Electronic LVDs include closed-circuit television, computer-assistive and visual prosthetic devices, etc.

Availability

Although a large number of manufacturers are producing LVDs, their availability in the developing countries is very limited due to the high costs involved. On the other hand, some magnifiers and telescopes, especially in low powers, are available from opticians and stationery or toy stores in most countries. Unfortunately, because these are not specifically labelled as devices for the visually impaired, their presence is often ignored. An example of this is a stand magnifier, which provides a 5X magnification and is of reasonable quality and low cost but is labelled as “insect inspector”. A simple market survey can help in identifying what magnifiers and other devices are available locally with opticians, stationers, hardware stores, and toy and hobby shops.

Simple LVDs can be produced in most of the countries where basic optical services are available, using locally available materials and appropriate technology. These include spectacle magnifiers, stand magnifiers, hand-held magnifiers, self-illuminated magnifiers, Galilean telescopes, telemicroscopes, ultra-violet filters and non-optical devices such as reading stands, writing guides, typoscopes and lamps.

One of the major restraints in producing LVDs in higher powers (i.e., above 5X) is the unavailability or high cost of aspheric lenses. This problem of spherical and chromatic aberration associated with high-power convex lenses can to an extent be controlled by employing applanatic systems (combination of lower power plus lenses to produce higher powers) and reduced aperture size with standardized increments in power and vergences.

Requirements for setting up facilities to produce LVDs

1. Production structure: Any optical laboratory which has the capacity to produce spectacles (i.e. grind optical lenses and fit them into spectacle frames) can be upgraded to produce assorted magnifiers by adding a few more pieces of equipment such as a drill machine, bench saw, wrench, grinders with buff, etc. On the

other hand, a dedicated laboratory to produce LVDs in large volume can also be established that can fulfil bulk orders. These laboratories can be established in the private sector (but the risk is that there will be no control over the prices) or in the government or NGO sectors.

2. Personnel: An optical technician with a know-how of basic optics can be trained in a few weeks to produce basic LVDs. Other staff needed may include a lens surfacing technician, a lathe machinist and personnel with higher training for product development and administration.

3. Raw materials: Materials will include PVC pipes, T-junctions, torches, reducers, plastic sheets, plastic resin, spectacle frames, optical lenses and dyes.

4. List of equipment: Electric bench saw, electric drill machine, lens edger, lathe machine, spherical lens generator, dye-casting machine, grinder with buff, lensmeter, assorted tools, and heaters.

5. Cost structure: The final cost of the finished product will depend on initial and recurring investments, and on running expenses such as staff salaries, cost of materials, rental, utility bills and government taxes.

Most specialties in ophthalmology are costly to develop and require specially trained people and sophisticated equipment. Low vision as a specialty is one area that can easily be initiated in any ophthalmic or optometric set-up with a minimum of investment and training. Most of the devices used for assessment can be produced locally, using indigenously available materials and appropriate technology. The use of simple magnifiers can help children pursue education in normal-stream schools and improve the quality of vision in visually impaired adults.

Each country can identify its own relevant existing human resources and train them in a short period of time to provide low vision care in a hospital or clinic setting. Standard manuals on production of inexpensive LVDs can be utilized to make these devices. As experience is gained, a cost-effective and sustainable low vision service can be developed. It would be preferable to plan the development of any such service so that it is capable of fitting into the ongoing national health and social welfare programmes. This will not only ensure its sustainability and cost-containment, but also its early acceptability and implementation.

Recommendations

Service delivery: Low vision care should, as a minimum, include proper techniques for (i) assessment of low vision, (ii) prescription and access to optical devices and (iii) skills training. It should be based on a team approach, bringing together elements of eye care, education, rehabilitation and social services.

Technology: The feasibility of establishing low vision care in the developing countries will depend largely on appropriate technology for devices needed. Local capacity for the production or assembling of LVDs should be considered for all items possible, to reduce costs. Countries and NGOs could collaborate as appropriate to achieve this.

In order to make low vision services accessible and affordable at the primary and secondary levels, a “first aid” or “instant aid” kit for low vision should be developed and made available to appropriate service providers.

4. LOW VISION ORIENTATION

4.1 What is a low vision service?

“Low vision services” is a widely utilized term that describes a variety of services offered to visually impaired people. The low vision field is developing as an area of expertise for many different disciplines that provide care within the eye care system. It is usually associated with a series of evaluation, training programmes and services to visually impaired persons that emphasize residual vision rather than visual loss

or blindness. The number of professional disciplines involved in this field has created a confusing array of conflicting terminology and professional philosophy of care.

As in any professional field, the scope of services provided within the profession varies from one practitioner to the other, depending on the individual's experience and geographical location, the area resources and the needs of patients. Given the continued increase in the development of new clinical programmes, new professional school curricula, an increasing number of specialists, and efforts to create a new type of professional trained solely for low vision work, there is a need to define terms and to establish acceptable guidelines for low vision rehabilitation services.

A low vision specialist is a specially trained professional (instructor or examiner) who contributes to the vision rehabilitation of the visually impaired.

Low vision care is a philosophy, and vision rehabilitation is the service. The low vision field thus entails an interdisciplinary group of professionals who work with low vision persons towards the goal of enhancing their level of visual activity. The philosophy is geared towards making the visually impaired aware of their remaining visual capabilities so they do not dwell on their loss or impairment. The low vision rehabilitation service involves a specific series of diagnostic evaluation and instructional-training sequences that are designed to help low vision persons overcome the handicapping effects of their visual impairment, function at an optimum level and live a comfortable lifestyle. The service may concentrate on specific vocational, educational, recreational or social tasks, but it must include a comprehensive look at all the individual's needs (vocational, educational, social, psychological, financial, optometric and medical). Such a service mandates the interaction of several disciplines and, to be successful, it requires the personal involvement of professionals from each discipline. Simply stated, low vision care is a philosophy that promotes the maximal use of vision, and the vision rehabilitation service is a commitment by an interdisciplinary group of people to help low vision individuals fulfil their maximum potential.

The service delivery system must be able to meet the widely varying needs of low vision persons in a variety of situations. Flexibility in delivering services is essential. It is impossible to find one scheme of care that will meet the needs of one person with 20/1000 acuity who is functioning relatively independently and of another individual with 20/60 acuity who can legally drive during the day but is totally incapacitated by the impairment or fear of blindness. The difficulty in developing a vision care programme for these two types in one service framework is the reason for so much confusion in the field. Each member of the low vision specialist team looks at an individual with a biased professional eye and establishes his or her own set of priorities for rendering services. Usually, these priorities are not consistent with those of other members of the team. Thus, even though all the team members are trying to rehabilitate the visually impaired person, confusion may be created and a weakened, sometimes ineffective, service is provided. The key to a successful programme is therefore intra-team communication and professional flexibility.

4.2 What is a low vision clinic?

A low vision clinic entails essentially the required professional and assessment tools required to provide evaluation of low vision, prescription of LVDs and training the patients in the use of their residual vision and devices to enhance their function.

Personnel: Personnel to manage the low vision clinic may include an ophthalmologist to provide diagnosis and management of active pathologies, an optometrist to assess the residual visual function, perform refraction and prescribe devices, and a low vision therapist to train the patient and provide guidance on social and rehabilitative issues.

Infrastructure: The low vision clinic can be based in an eye or a general hospital with a department of ophthalmology, in a school for the visually impaired, or as an independent facility. The important thing is to have a steady flow of patients, the facility being accessible to visually impaired persons. In terms of space, at least one room is essential for the actual clinic, while additional space will be required for the reception and waiting area and the stores.

Equipment: Equipment for the low vision clinic includes standard ophthalmic equipment such as retinoscope and ophthalmoscope, trial set of lenses, lensmeter, etc., and specialized tests for assessment of

visual functions such as far and near acuity, reading acuity, contrast sensitivity, colour vision and visual fields. In addition, a comprehensive trial set of LVDs, which includes optical, non-optical and electronic devices, is also required. Optical devices include spectacle magnifiers, hand and stand magnifiers and telescopes. Non-optical devices include felt-tip pens, writing and reading guides, typoscopes, reading stands, absorptive filters, lamps, etc. Electronic devices include closed-circuit television, talking watches and computer-assistive technology such as special software programmes (JAWS, ZOOMTEXT).

Output: An average low vision clinic with a staff of two trained persons can examine 10 new patients a day and provide follow-up for another five patients.

4.3 What is low vision assessment?

This is a critical step in the process of low vision management and comprises two main components – case history, which is essentially an interview that identifies the patient's problems; and vision assessment, which involves clinical and performance tests that identify visual capabilities. The examination protocol results in determining rehabilitative treatment through optical and other assistance (prescribing LVDs) for visual tasks and referral for other rehabilitative treatment.

Refraction: Together with the determination of visual acuity, this is probably one of the most crucial steps in vision assessment. It often requires both objective and subjective refraction using trial lenses in a trial frame. In low vision patients, astigmatic correction often necessitates a rough estimate of axis, cylindrical power that is then manually refined by subjective methods.

Letter chart acuity: This is important for reading and differentiating signs and faces. Alternative optotypes, including single letters, letter charts, gratings and crowded letters, are available for testing.

Reading acuity: Typeset print tends to be more congested and complex. The examiner needs to ensure best optical focus for the patient and should note the smallest print visible and the viewing distance. Two thresholds can also be determined – smallest print for best speed and smallest print legible.

Prediction of magnification needs: This involves establishing a goal with the client – for instance reading a 1.0M newsprint with the best efficiency. The examiner tries to determine the required change in viewing distance to achieve the goal and selects the magnification device that provides the needed equivalent viewing distance.

Visual fields: These are important for orientation, mobility and search. Different visual field tests, such as the Amsler grid, tangent screen and confrontation tests, are employed.

Contrast sensitivity: Contrast sensitivity plays an important role in orientation, in mobility and in detection and determination of shapes. Peak contrast sensitivity is best found with sharp-edged targets of large size. The clinical examination involves determining the minimum contrast required to detect a target.

Response to light: This is of importance to the client especially in anticipating changes in functional abilities and the need for protection. Changes in light levels result in changes in visual acuity and fields.

Colour vision: This retinal function is important because it helps in detection and colour coding.

Binocular vision and oculomotor functions: Even though stereopsis is not a major issue in most low vision patients, eyes sometimes function better together. These functions are important for anticipating problems related to eye movement.

4.4 Prescribing LVDs

The objective in prescribing LVDs is to enable the visually impaired person to use his or her remaining vision more effectively and efficiently. Properly prescribed devices help the low vision individual to overcome the visual impairment and avoid disability.

LVDs come in many forms. For near vision, these may be available as spectacles, as hand-held/stand magnifiers, or as telemicroscopes. They are also available as self-illuminated. The devices for distance include different types of telescopes, i.e., spectacle-mounted, hand-held, bioptic, etc.

The most important factors in prescribing these devices are to calculate the magnification needs correctly and to select a device that would deliver the required magnification in the most appropriate method. Other deciding factors in prescribing are duration of the task, distance from the eyes, size of the visual field, steady or shaky hands, binocular versus monocular, and lighting contrast and other ergonomic factors.

Magnification: Magnification in low vision is specified by the angular magnification provided by a device. Telescopes have magnification which depends on the focal length of the eye-piece and the objective lens:

$$M_t = -F_e/F_o \quad \text{where } M_t = \text{angular magnification}$$

$$F_e = \text{focal power of the eye-piece}$$

$$F_o = \text{focal power of the objective lens}$$

The required magnification of the telescope is calculated as:

$$M_t = \text{actual visual acuity/desired visual acuity}$$

In cases where the target acuity is not known, 6/12 is taken as a ballpark figure.

Prescribing magnifiers: Magnifiers for near are prescribed by again calculating the magnification needed for near as actual/desired. For example, a person can read N36-size print from a distance of 25 cm and needs to read newspaper print (=N6). The magnification needed is therefore $36/6 = 6$ times or 6X.

Two different formulae can be used to calculate the 6X. According to the first theory, the minimum distance of distinct vision is taken as 25 cm (or 0.4 m). The diopter power of a lens is divided by 4 to derive the magnification. For example, a 10-diopter lens will provide a magnification of $10/4 = 2.5X$. The other formula takes the minimum distance of distinct vision as 40 cm. Magnification is therefore derived by the formula $F/2.5 = \text{magnification}$. For example, a lens of 10 diopters according to this formula will provide a magnification equal to 4 times or 4X. The difficulty with both the above equations is that the resulting magnification holds true only in specific conditions, i.e., that the patient's working distance is assumed to be 40 cm or 25 cm.

Alternatively, another approach can be applied to calculating the required magnification by using M cards or Sloan's cards. They come in a set range from 1M to 10M. The objective is to measure the remaining near vision acuity in M notation. If the patient cannot read the 10M print, the reading distance is reduced to 20 cm, thus enlarging the 10M by a factor of 2. Once the remaining near acuity is obtained, the magnification required for this patient to read 1M print can be arrived at very easily. For example, for a patient with a near visual acuity of 4M, a magnification of 4X is required in order for him/her to read 1M print. Assuming the relative distance of reading is 40 cm, the equation ($M = F/2.5$) may be used to calculate the addition. The answer is +10.00D.

When the above treatment is recommended, reduction in the working distance must be emphasized. For those patients who find the short reading distance unacceptable, an alternate type of magnifier needs to be prescribed.

Hand-held magnifiers are portable and preferred by some low vision patients, especially for short tasks such as spotting. Steady hands are essential to maintain a steady focus and clarity for reading.

Stand magnifiers are another option. These have a high power plus a lens fitted in a stand so that the distance from the reading material remains constant. They are useful for reading for longer duration and can also include a light source, thus becoming illuminated stand magnifiers.

The telemicroscope is generally binocular and is yet another alternative. The magnification ranges from 3X to 8X. Such devices are prescribed when a relatively longer working distance is essential, as, for example, playing cards, reading music and accessing computers. This device has the smallest field of view of all magnifiers.

4.5 Instruction and training in the use of LVDs

In the management of a low vision client, the clinical examination and prescription of appropriate LVDs are essential components. However, the instruction and training in the use of the prescribed LVDs is an equally important process that is often taken for granted. It involves training in the use of LVDs, training visual skills to perform functional tasks, and training performance of tasks while using aids. It requires supervised training and directed practice.

Reading spectacles: This is one of the commonest prescriptions to a low vision client, but differs from the regular reading prescription in that it involves reading at very close distances of closer than 20 cm up to 2 cm or shorter. The instructor helps the client to understand and control the working distance. Different reading spectacles can be employed for this purpose that include frame-mounted spacers for high adds, necktie loop to wear around the neck, and the use of increased illumination to improve contrast.

Hand-held magnifiers: This is also a commonly prescribed device that needs proper instruction for the client to make optimum use of it. The use of this device for magnification becomes complicated when the client has a pre-existing refractive error such as myopia or hyperopia. For example, if the hand-held lens is kept away from the eye the myopes would have to wear their distance correction, while the hyperopes would have to take off their glasses; and if the hand-held lens is kept close to the eye, the hyperopes would have to wear their reading glasses, while the myopes would have to take off their distance glasses.

Stand magnifiers: This is an important tool in the treatment of low vision clients and needs a very good understanding of the range of clear near vision focus for the patient. The patient is usually required to wear his reading glasses, and the instructor helps him/her to understand the effects of changing eye-to-lens distance. In this instance, moving closer to the lens gives more magnification (effective viewing distance) and a wider field of view.

Telescopes: Telescope use is sometimes difficult for some patients, especially the elderly. This is an adjustable optical device used for viewing objects at a distance. Lengthening the telescope adds plus power for hyperopes, while shortening it renders it useful for myopes. Its use requires some skill, especially in training efficiency for scanning and following a moving target.

Video-magnifiers (closed-circuit television (CCTV)) and computer displays: While providing a high power of magnification and improved contrast, their use requires a proper working distance, proper spectacle correction, learning the controls and developing coordination in the different manipulative tasks.

Visual skills

Eccentric viewing: This technique is very useful for loss of vision that involves the central field (central scotomas) and involves helping the patient by establishing awareness of a preferred retinal locus.

Search scanning: This is a good technique to use in patients who have both central and peripheral field loss and involves learning how to switch fixation from one object to another and back.

Environmental modifications: This compendium of techniques involves enhancing visibility and conspicuity. Some examples include making things bigger, brighter and bolder, enhancing luminance and colour contrast, and optimizing lighting and reducing glare.

5. THE STATUS AND SITUATION OF LOW VISION SERVICES IN DIFFERENT COUNTRIES

5.1 Eastern Mediterranean Region

Afghanistan

Demography and prevalence of blindness and low vision

Afghanistan has an estimated population of 25.8 million with a life expectancy of 46 years. The prevalence of blindness and low vision is difficult to determine, but estimates from NGOs working there (Serving, Enterprise, Relief, Vocational, Enabling – SERVE) place it at about 1.2% for blindness. There are therefore an estimated 300 000 blind and about 900 000 with low vision. Thus, using the principle of 95% of the magnitude of blindness to estimate those in need of low vision services, the number requiring services is about 285 000. There is no national plan for prevention of blindness.

The main causes of blindness and low vision are cataract, uncorrected refractive errors and aphakia, glaucoma, corneal scar and pterygium. Vitamin A deficiency (VAD) is thought to be the single most common cause of childhood blindness in Afghanistan. The National Organisation for Ophthalmic Rehabilitation (NOOR), in a sample of 2258 children in the Kabul area, found night blindness (XN) in 4.65% and Bitot's spots (XIB) in 6.69%.

Clinical, educational and vocational services

Some NGO-run programmes are providing services for low vision and blind persons. These services are provided by CBM, SERVE and CDAP (Comprehensive Disabled Afghan Programme) and include early intervention, CBR, integration education and Braille. The services are available in parts of Kabul, Ghazni, Logar and Wardak province, Laghman, Kunar and Nangarhar province, Kandahar and Herat province, Mazar-e-Sharif, Kunduz and Takhar province. There are 50-55 ophthalmologists, three optometrists and about 100 ophthalmic nurses and paramedics in the country.

In the special education sector, there are 33 resource teachers and 120 field workers who have received special training. IAM (International Assistance Mission) runs two centre-based educational institutions, one each in Kabul and Mazar-e-Sharif. CDAP has small centres in Ghazni, Kandahar and Herat, while SERVE operates in Kabul. There are about 600 blind/low vision children benefiting from the blind care programme through these three organizations.

IAM runs a vocational training centre in Mazar-e-Sharif, while SERVE and CDAP provide vocational training through their CBR programme. Skills imparted include weaving, broom-making, blind-making, animal husbandry, chicken-keeping, shopkeeping, kitchen gardening especially for women, and carpet-weaving. There are about 300 visually impaired beneficiaries. About 400 visually impaired persons have received O&M and ADL training through the CBR programme.

Large-print books are available through SERVE, while some spectacles for low vision are produced in the optical workshop run by IAM in Kabul. The major constraints include lack of a national eye care plan, paucity of trained human resources and inadequate infrastructure.

Pakistan

Demography and prevalence of blindness and low vision

Pakistan has an estimated population of 130 million with a life expectancy of 63 years. Based on a national survey in 1987-1990, the prevalence of blindness is 1.78%. There are therefore an estimated 2.3 million blind and about 6.9 million with low vision. Thus, using the principle of 95% of the magnitude of blindness to estimate those in need of low vision services, the number requiring services is about 2.2 million. There is a national plan for prevention of blindness that has incorporated a low vision component.

The main causes of blindness and low vision are cataract, corneal opacity, uncorrected refractive errors and aphakia, and glaucoma.

Clinical, educational and vocational services

There are about 4500 primary-level basic health units and rural health centres, 107 district headquarter hospitals (secondary level) and 20 tertiary-level teaching eye departments. At the primary level, Pakistan has a cadre of lady health workers that number over 40 000. There are 1700 ophthalmologists, 20 optometrists and about 400 ophthalmic nurses and ophthalmic paramedics in the country.

In the special education sector, there are 300 resource teachers who have received special training. There are 63 special education centres (50% government and 50% NGO) for the visually impaired with 3000 enrolled children and 35 vocational training centres. The Pakistan Association of the Blind is a major national organization that provides educational and vocational training opportunities to the blind.

Low vision services form part of the national plan for development of comprehensive eye care and prevention of blindness. At least one low vision clinic has been established in five centres in four large provinces, and a further five are planned over the next two years. A regular training programme of optometrists exists and there is a plan to start training of refractionists from 2001. Piloting of extension of the low vision services to the secondary level is in progress. Two optical workshops have been developed that manufacture low-cost LVDs.

Three universities and other national institutions run training programmes for special education teachers. The major constraints include insufficiency of trained human resources to provide low vision services, and inadequate services.

The main INGOs working to support prevention of blindness programmes include SSI, CBM and The Fred Hollows Foundation. The national low vision programme gets its major support from SSI.

5.2 South-East Asia Region

Bangladesh

Demography and prevalence of blindness and low vision

Bangladesh has an estimated population of 122 million. Based on a national survey in 2000, the prevalence of blindness is 1.4% in those aged 30 years and over. There are therefore an estimated 1.7 million blind and about 5.1 million with low vision. Thus, using the principle of 95% of the magnitude of blindness to estimate those in need of low vision services, the number requiring services is about 1.6 million. There is a national plan for prevention of blindness that has incorporated a low vision component.

The main causes of blindness and low vision are cataract, macular degeneration, phthisis and optic atrophy.

Clinical, educational and vocational services

A service for low vision care is being established at Chittagong Eye Infirmary and Training Complex. There is also a small low vision clinic in the private sector in Dhaka, run by an ophthalmologist. Apart from this, there are no ophthalmologists, ophthalmic nurses or paramedics trained in low vision service provision. There are no trained optometrists in the country, but a training programme is being considered. Optical services are provided by ophthalmologists (who do the refraction) and local dispensing opticians.

There are resource centres attached to normal schools for integrated education in all 64 districts in Bangladesh. These are for blind and visually impaired students. Each centre has a resource teacher who provides educational support. Twenty-one resource centres have hostels, so children can be residential. There is a total of 180 students in these schools; the vast majority are boys, and many are aged over 15 years. HKI is in the process of developing inclusive education programmes in non-formal schools run by NGOs. There are also approximately five nongovernmental integrated programmes with approximately 90 pupils.

There are two vocational training centres, both in Dhaka division. HKI has its own centre for training. Seven districts have CBR programmes run by different NGOs. These programmes provide basic training in orientation and mobility, activities of daily living, and income-generating schemes.

The Government Social Service Department runs a one-year certified diploma course for master trainers/service providers for the non-medical personnel. Low vision has received little attention, but has recently been included in the National Eye Care Programme. The main constraints include lack of trained eye care professionals who could deliver low vision services, lack of awareness among eye care professionals, teachers and rehabilitation workers, the relative unavailability of LVDs at an affordable cost, and inadequate infrastructure.

India

Demography and prevalence of blindness and low vision

India has an estimated population of 960 million, with 65% of its population aged over 60 years. Based on WHO estimates, the prevalence of blindness is 1%, while the National Programme for Control of Blindness places it at about 1.49%. There are therefore an estimated 10-15 million blind and about 25-28 million with low vision. Thus, using the principle of 95% of the magnitude of blindness to estimate those in need of low vision services, the number requiring services is about 9.5-14.25 million. There is a national plan for control of blindness.

The main causes of blindness are cataract, uncorrected refractive errors, retinal disease and glaucoma.

Clinical, educational and vocational services

An All India Plan of Action on Low Vision was developed in 1998, which provides direction and guidance to development of low vision services.

For the estimated 14 million people in need of low vision services, there are 22 low vision centres which existed prior to 1998. The Government of India has approved funds for nine additional full-fledged low vision centres. Sixteen cities in 14 States will soon have at least one low vision clinic. Eleven courses for training professionals in this field have so far been conducted. Of these, six training programmes were for those in clinical low vision and the rest for special education and rehabilitation personnel. So far, 150 professionals have been trained through these programmes.

LVDs are produced locally and are available on a limited scale at some of the centres. Research activities have resulted in the production of aspheric lenses in different powers that were hitherto imported. Production of more complicated electronic devices such as CCTV is also under way on a limited scale.

The major constraints in development of low vision services are the limited number of professionals and training opportunities in this field and the non-integration of rehabilitative with ophthalmic curative services.

Indonesia

Demography and prevalence of blindness and low vision

Indonesia has an estimated population of 203 million, spread out in an archipelago of more than 13 000 islands inhabited by 300 ethnic groups speaking 365 languages and dialects. Based on a national survey in 1993-1996, the prevalence of blindness is 1.5%. There are therefore an estimated 3 million blind and about 9 million with low vision. Thus, using the principle of 95% of the magnitude of blindness to estimate those in need of low vision services, the number requiring services is about 2.8 million. There is a national plan for prevention of blindness that has incorporated a low vision component.

The main causes of blindness are cataract, optic nerve disease, uncorrected refractive errors and retinal disease.

Clinical, educational and vocational services

Indonesia has 10 eye hospitals and 500 ophthalmologists. These are supported by 814 nursing, allied health and non-medical personnel.

In the special education sector, there are 438 special education teachers and 47 special education centres for the blind. There are 1084 children enrolled in these schools. In addition, there are 9135 visually impaired and blind children in 1021 other special schools (e.g. mentally disabled, hearing impaired, physically disabled) and 341 visually impaired children in 184 mainstream schools. CBR programmes are fairly well established in Indonesia, especially in Malang, Yogyakarta, Manado and Solo.

Vocational and educational training for the blind is provided by a few institutions such as the Metra Nitra Foundation and Laetitia. However, low vision services are provided by very few. A major initiative in cooperation with CBM has been undertaken by the IB Foundation, which has set up three low vision clinics in the country. It now plans to set up six more clinics and train human resources for CBR, teachers in low vision care, eye care professionals and training of trainers with support from CBM.

At present, LVDs are difficult to access. However, non-optical devices such as typoscopes, large print, reading frames, etc., can be produced locally. The major constraints include lack of awareness about low vision amongst eye care professionals, lack of low vision experts, insufficiency of trained human resources to provide low vision services, and inadequate services.

Maldives

Demography and prevalence of blindness and low vision

Maldives has an estimated population of 269 010 with a life expectancy of 70+ years. Based on national estimates, the prevalence of blindness is thought to be 0.5%. There are therefore an estimated 1345 blind and about 4035 with low vision. Thus, using the principle of 95% of the magnitude of blindness to estimate those in need of low vision services, the number requiring services is about 1277. There is a national policy on eye care.

The main causes of blindness and low vision are cataract, uncorrected refractive errors and corneal opacity.

Clinical, educational and vocational services

The Ministry of Health, as a coordinating agency for all the sectoral nodal points, provides the organizational support in the formulation of health sector policies and plans; implements, monitors and evaluates programmes; and mobilizes needed resources to supplement government expenditure. In addition, the Ministry also coordinates four regional hospitals. The Department of Public Health is responsible for delivering primary health care and basic curative care (preventive, promotive, curative and rehabilitative care) to the islands and atolls.

The Indira Gandhi Memorial Hospital is a 200-bed tertiary-care general and specialty hospital, geared to provide medical services and achieve greater self-reliance in the field of medical care. It has more clinical departments (general medicine, surgery, gynaecology and obstetrics, paediatrics, orthopaedics, ophthalmology and ENT) than other hospitals. This is the referral hospital for all regional hospitals and health centres. There are six ophthalmologists, four ophthalmic nurses and two optometrists.

The Health Master Plan 1996-2005 has translated the Government of Maldives policy on reduction of preventable blindness in the country. Its strategies are: creating awareness; capacity-building for management of eye problems; provision of screening services; early detection and management of disabilities; and strengthening of the IEC programme.

There are no special education centres for visually impaired people in the country. The Government provides an allowance of US\$ 25.4 (MRF 300/-) monthly for all visually impaired people in the country. Due to the very small number of visually impaired people, it is not cost-effective for community rehabilitation centres. The Government is now investigating a plan for the establishment of a vocational training centre for the disabled persons in the country.

The country has only one health training institute, whose training is mainly focused on developing health care workers for the country's immediate needs. The health care workers are trained as multipurpose workers and can assist ophthalmologists. The country depends heavily on expatriate professionals, including doctors, nurses and pharmacists.

There are three shops in the country providing services for lenses and frames. All materials are imported, and the charges are relatively high. No NGOs or any other organizations are involved in providing services for the visually impaired. Major constraints in developing low vision services include lack of awareness amongst the general public, inadequate infrastructure to cater for the logistics of screening and provision of services in small communities living on separate islands, the high cost of imported LVDs and the shortage of trained human resources.

Nepal

Demography and prevalence of blindness and low vision

Nepal has an estimated population of 22.5 million. Based on a national blindness survey in 1981, the prevalence of blindness is 0.89%. There are therefore an estimated 0.2 million blind and about 0.6 million with low vision. Thus, using the principle of 95% of the magnitude of blindness to estimate those in need of low vision services, the number requiring services is about 0.19 million.

The main causes of blindness are cataract, retinal disease, glaucoma and trachoma.

Clinical, educational and vocational services

There are 89 ophthalmologists supported by 309 ophthalmic assistants. There are no ophthalmic nurses or optometrists.

In the special education sector, there are 59 special education teachers with 422 children enrolled in 33 special integrated schools. The main functions of these schools include teaching of Braille, orientation and mobility training, and educational and vocational training in coordination with CBR for the visually impaired. There are 15 vocational training centres and nine CBR programmes currently functioning in the country.

Since November 2000, in collaboration with Dark & Light, a low vision service has been started at the Himalaya Eye Hospital and Mechi Eye Care Centre. The service includes training of integrated schoolteachers, CBR workers and ophthalmic paramedics in low vision, and low vision awareness in ophthalmologists. An optical workshop exists that can produce simple magnifiers and other simple hand-held LVDs.

The major organizations involved in provision of services to the visually impaired include HKI, the National Association of the Blind, the National Association of the Blind and Partially Sighted, the National Association for the Welfare of the Blind, and Nepal Netra Jyoti Sangh. The major constraints include lack of data on low vision, lack of awareness, and insufficiency of trained human resources to provide low vision services.

Sri Lanka

Demography and prevalence of blindness and low vision

Sri Lanka has an estimated population of 8.2 million. Based on a national survey in 1981, the prevalence of blindness is 0.42%. There are therefore an estimated 0.076 million blind and about 0.23 million with low vision. Thus, using the principle of 95% of the magnitude of blindness to estimate those in need of low vision services, the number requiring services is about 0.072 million. There is a national plan for prevention of blindness that has incorporated a low vision component.

The main causes of blindness and low vision are cataract, glaucoma, macular degeneration, vitamin A deficiency and diabetes.

Clinical, educational and vocational services

There are about 25 ophthalmologists and two major teaching eye institutions in the country. They are supported by 200 ophthalmic nursing officers, 20 ophthalmic technologists (refractionists) and four orthoptists. Two low vision clinics have recently been established in Colombo and Kandy.

In the special education sector, there are four schools for the blind. These do not, however, provide any low vision care. The special education teachers cover about 20% of the mainstream schools but do not provide any low vision care. Two vocational training centres provide training in trades such as broom-making, carpet-weaving, telephonist and receptionist, and the running of small sundry boutiques.

CBR work with the incurably blind is being supported by CBM in the Matara area through the Nuwan Sarana. The Sri Lanka Eye Foundation has recently launched a pilot CBR initiative in Central Province. LVDs are not manufactured locally and have to be imported.

The major constraints include insufficiency of trained human resources to provide low vision services, and inadequate services.

Thailand

Demography and prevalence of blindness and low vision

Thailand has an estimated population of 59 million. Based on a national survey in 1999, the prevalence of blindness is 0.3%. There are therefore an estimated 0.17 million blind and about 0.53 million with low vision. Thus, using the principle of 95% of the magnitude of blindness to estimate those in need of low vision services, the number requiring services is about 0.16 million. A national committee for prevention of blindness was set up in 1982.

The main causes of blindness and low vision are cataract and uncorrected refractive errors. The main causes of low vision age-wise include: preschool age – retinopathy of prematurity, cataract and cortical blindness; school age – nystagmus, cataract and high myopia; adults 16-44 years – retinitis pigmentosa, glaucoma, cataract and optic atrophy; adults 45-66 years – macular degeneration, diabetic retinopathy and glaucoma.

Clinical, educational and vocational services

There are 584 ophthalmologists, 400 ophthalmic nurses and 15 optometrists in the country.

Although services for the blind were set up as early as 1939, the first low vision clinic was established in Ramathibodi Hospital, Malidol University, in 1990. In 1994-1995, the Government (Ministry of Public Health) took on the responsibility of caring for the blind and low vision persons. Each person with low vision is entitled to one free LVD from the Sirinthorn Rehabilitation Centre. Furthermore, after 1990, a formal integrated education system was introduced in the country.

Low vision services are fairly well advanced in Thailand, and LVDs are easily available. There is also good networking between different eye care providers.

The major constraints include the lack of awareness of existing low vision services by the clients and the ophthalmic community.

5.3 Western Pacific Region

Australia

Demography and prevalence of blindness and low vision

Australia, with an estimated population of 18.2 million, is a large continent with a highly urbanized population. Over 80% of Australia's 19 million people live in cities, mainly along the coastal areas. The majority of the population is located on the south-eastern coast. There are large inland areas in the central, north and west of the country that are very sparsely settled. In the rural and remote areas, considerable travel (sometimes hundreds of kilometres) is required to obtain basic services.

As in many industrialized countries, the challenge facing Australia is the ageing of the population. By 2030, the proportion of people aged over 65 years will double. Life expectancy is 82 years for females and 78 years for men.

When best corrected visual acuity is used with the WHO definitions of low vision (VA <6/18) and blindness (VA <3/60), the prevalences are 0.84% and 0.17% respectively.

Thus, the total number of persons with low vision is 152 880 and, of these, the number (25%) requiring low vision services is 38 220. The main causes of blindness and low vision are macular degeneration, glaucoma and cataract. The challenges facing the provision of eye care and low vision services are the ageing of the population and the "epidemic" of diabetes.

Clinical, educational and vocational services

There are 600 ophthalmologists, 1900 optometrists, 200 orthoptists and about 300 resource teachers.

Each of the Australian States has at least one school for children who are visually impaired. Most children are integrated into local preschool, primary and secondary schools. Home-based early intervention is provided to families with infants or young children who are visually impaired. The exact number of children who receive services is not known, but is estimated to be 3000.

With few exceptions, most vocational training takes place in the State education system in the Technical and Further Education (TAFE) system, with support to students from vision rehabilitation agencies. Each of the major agencies has community-based programmes. Services are provided to people living in their own homes and to people in residential care.

Currently, less than 20% of people with low vision utilize services. An additional challenge will be faced with an increase in the numbers of older people with low vision. There is a culturally and linguistically diverse population, some of whom experience social or economic disadvantage in accessing health services, and low vision care in particular. Barriers to access to low vision care are currently being researched as part of the Lions Low Vision Initiative. Possible barriers could be related to the consumer, to professionals, and to location of services.

Cambodia

Demography and prevalence of blindness and low vision

Cambodia has an estimated population of 10.5 million. Based on surveys in 1996 and 1997, the prevalence of blindness is estimated at 1.2%. There are therefore an estimated 0.12 million blind and about 0.36 million with low vision. Thus, using the principle of 95% of the magnitude of blindness to estimate

those in need of low vision services, the number requiring services is about 0.11 million. There is a national plan for prevention of blindness that aims to reduce the prevalence of blindness to 0.5% by 2005.

The main causes of blindness and low vision are cataract, corneal opacity, uncorrected refractive errors and aphakia, and glaucoma.

Clinical, educational and vocational services

Currently, only about 40% of the population have access to eye care services. There are 32 ophthalmologists, 79 ophthalmic nurses and eight optometrists. A national primary eye care programme has been initiated in four provinces in the country. The national plan proposes to train nine ophthalmologists, 17 ophthalmic nurses, seven optometrists, 28 basic eye doctors, 56 basic eye nurses, 45 optometry technicians, 132 ophthalmic assistants, 230 primary eye care trainers and 2215 primary eye care workers by 2005.

Low vision services are virtually non-existent, while functional low-cost optical workshops have been set up in four provinces, either singly or to support the existing eye units.

The major constraints include poverty, lack of awareness amongst eye care professionals and the general public, and lack of training opportunities.

China

Demography and prevalence of blindness and low vision

China has an estimated population of 1243 million with a life expectancy of 63 years. Based on a national survey in 1987, the prevalence of blindness is 0.43% and that of low vision 0.58%. There are therefore an estimated 5.3 million blind and about 7.2 million with low vision. Thus, using the principle of 25% of all visually impaired (less the true blind) requiring low vision services, the number requiring services is about 3.1 million. There is a national plan for prevention of blindness.

The main causes of blindness are cataract, corneal diseases, trachoma, chorioretinitis and glaucoma.

Clinical, educational and vocational services

There are 20 000 ophthalmologists, 16 000 ophthalmic nurses and 300 optometrists. There are 27 schools for the blind in the country in which about 4157 children are enrolled. A further 3378 visually impaired children are studying in mainstream schools. There are 900 rehabilitation centres in China.

In Beijing Tong Ren Hospital, a low vision clinic has been functioning for the past 20 years. A national low vision training course was held in 1986 at the Beijing Tong Ren Hospital, with support from WHO. LVDs, CCTVs and teaching material on low vision are available locally.

In order to promote low vision care in China, the Government has drawn up the China Disabled Persons ninth five-year working outline. In this initiative, rehabilitation centres will be established in another 200 counties, at least five low vision rehabilitation workers will be trained by each province, and at least one low vision worker will be assigned to each rehabilitation centre.

Hong Kong

Demography and prevalence of blindness and low vision

Hong Kong has an estimated population of 6.9 million. According to the Hong Kong Rehabilitation Programme Plan published in 1999, the estimated numbers of totally blind and people with low vision in 1999 were the following:

Mild and moderate degree of low vision (visual acuity of the better eye from 6/18 to better than 6/120) – 40 613 persons

Severe degree of low vision (visual acuity of 6/120 or worse or constricted visual field with the widest field diameter 20 degrees or less, irrespective of the visual acuity) – 27 076 persons
 Number of totally blind – 6728 persons

Thus, the total number of persons with low vision is 67 689 and, of these, the number (25%) requiring low vision services is 16 922. According to the results of a survey carried out by the Hong Kong Society for the Blind's General Eye and Low Vision Centre from 1993 to 1997, the 10 major causes of low vision (best aided visual acuity less than or equal to 6/18) were cataract, myopic degeneration, maculopathy, glaucoma, diabetic retinopathy, age-related maculopathy, retinitis pigmentosa, retinal detachment, nystagmus and optic atrophy. They are also the major causes of blindness (best-aided visual acuity less than or equal to 6/60).

Clinical, educational and vocational services

There are 195 ophthalmologists and 1902 optometrists. There are two special education centres with 40 teachers and 233 students, and two integrated education centres with nine teachers and 45 students in Hong Kong. In addition, 65 special teachers have been trained by the Hong Kong Institute of Education (HKIE), and they work in mainstream schools. There are three main vocational training centres in Hong Kong that are run by the Hong Kong Vocational Training Council, HKSB and the Hong Kong Blind Union. CBR is also provided by HKSB through their Rehabilitation and Training Centre. This is further strengthened by the social welfare support provided by the same centre.

Training programmes for master trainers and service providers are run by HKIE, the Hong Kong Academy of Ophthalmology and the Hong Kong Polytechnic University. The main organizations involved in low vision care include HKSB, the Hong Kong Blind Union and the Ebenezer School and Home for the Visually Impaired. LVDs are easily available and are imported from China, Japan, USA and UK.

The major constraints include the lack of awareness amongst the general public about the availability of low vision services.

Japan

Demography and prevalence of blindness and low vision

Japan has an estimated population of 125.6 million. Based on a national survey in 1996, the number of persons with visual impairment is 305 000. Of these, the number (approximately 25%) requiring low vision services is 76 250.

The main causes of blindness and low vision are glaucoma, diabetic retinopathy, retinitis pigmentosa, optic nerve atrophy and macular degeneration.

Clinical, educational and vocational services

There are 11 408 ophthalmologists in the country. In the special education sector, there are 70 schools for the blind with 4245 children enrolled. Professional training: the main training programmes provided in the schools for the blind are massage therapy, acupuncture and/or moxibustion. Some schools provide the students with training courses in music, piano-tuning and domestic science.

Under the School Educational Law, it is stipulated that disabled children be registered with special schools according to the kind of disability. However, in many cases both the children and their parents prefer them to attend ordinary schools. The number of schools providing integrated education is increasing due to these requests. A major problem in this regard, however, is the lack of professional teachers who can deal with visually impaired students.

There are more than 1100 universities in Japan. Currently, visually impaired students are qualified to take an entrance examination in Braille or large print at 144 universities. Some of these students choose to enter psychology, law or mathematics courses.

Low vision devices are easily accessible and are manufactured in Japan. There are two training centres for rehabilitation workers for the visually impaired. So far, 350 such workers have been trained.

Under the welfare benefit system for the visually impaired in Japan, the visually impaired are entitled to issuance of a government disability notebook, medical fee assistance for the disabled, provision and repair of aids (white cane, artificial eye, Braille tools and special sunglasses), tax exemptions, allowances, transportation, social activity (volunteer worker for home visits, loan of guide dog, guide helper for the blind, loan of Braille and voice books) and social welfare funds.

Lao People's Democratic Republic

Demography and prevalence of blindness and low vision

Lao PDR has an estimated population of 5.1 million. Based on a national survey in 1986, the prevalence of blindness is 1%. There are therefore an estimated 51 000 blind and about 153 000 with low vision. Thus, using the principle of 95% of the magnitude of blindness to estimate those in need of low vision services, the number requiring services is about 48 450. There is a national plan for prevention of blindness.

The main causes of low vision are cataract, corneal opacity, glaucoma and retinal disease.

Clinical, educational and vocational services

Lao PDR began the blindness prevention programmes in 1985, with major thrusts comprising human resource and infrastructure development. This entailed the posting of eye surgeons and their assistants – “mid-level personnel in eye care” – to the strategic provinces along the Mekong. Activities are strictly based on the fundamental strategy of primary eye care within the primary health care framework.

The above developments took almost 10 years of national efforts under a WHO initiative and were also supported by Thailand and by other international organizations. There are six ophthalmologists, seven cataract surgeons, five refractionists and 94 ophthalmic nurses in the country.

In the special education sector, there are three special education teachers who look after 21 blind and two low vision children. There is integrated education in practice. There is one vocational training centre.

CBR programmes, supported by CBM, are being run in six districts of two provinces. A rudimentary low vision service exists, where low vision persons can obtain refractive error correction and some magnifiers. This service is provided by the Ophthalmology Centre and the National Rehabilitation Centre. There is no local production of LVDs.

Special education teachers are trained for mainstream schools. The major constraints include paucity of trained human resources to provide low vision services, and inadequate services.

Malaysia

Demography and prevalence of blindness and low vision

Malaysia has an estimated population of 21 million. Based on a national survey in 1996, the prevalence of blindness is 0.29% and low vision 2.44%. The total number with visual impairment is therefore 573 300. Of these, the number (approximately 25%) requiring low vision services is 136 158. There is a national plan for prevention of blindness.

The main causes of blindness and low vision are cataract, macular degeneration, corneal opacity and retinal disease.

Clinical, educational and vocational services

There are 230 ophthalmologists, 500 optometrists, 250 ophthalmic paramedics and 13 000 opticians in the country.

In the special education sector, there are 181 special education teachers, three special education schools for the visually impaired, 22 integrated education programmes and three vocational training centres. The Malaysia Association for the Blind (MAB) is a major national organization that provides educational and vocational training opportunities to the blind and has promoted low vision care since 1978.

The development of low vision services in Malaysia had an early start in 1978, from the initiatives taken by MAB. The St Nicholas Home for the Blind and the Sarawak Society for the Blind also provide low vision services. With effect from 2001, all general hospitals of the Ministry of Health will have low vision clinics, starting with at least the basic equipment. Currently, all LVDs are imported. There are a number of CBR programmes for the visually impaired in the country, with 508 workers and 5100 beneficiaries.

Universities and other national institutions run training programmes for special education teachers, ophthalmologists, optometrists and ophthalmic paramedics. The major constraints include lack of registration of low vision persons, inadequate infrastructure for low vision care, difficulty in obtaining LVDs and hi-tech equipment which are usually expensive, lack of publicity of low vision services and special needs, poor networking between service providers, and paucity of trained staff to identify people with low vision in remote areas.

New Zealand

Demography and prevalence of blindness and low vision

New Zealand has an estimated population of 3.6 million. Based on a Regional Health Authority Study in 1994, there are an estimated 32 000 people with significant visual problems.

The main causes of blindness and low vision are macular degeneration, glaucoma and diabetic retinopathy.

Clinical, educational and vocational services

There are 72 ophthalmologists, 350 optometrists and six orthoptists. An inconsistent low vision service is offered in New Zealand. While there are some low vision services in the country, these are funded sporadically. At present, there is a minimal service in Auckland, Christchurch, Dunedin, Wanganui and Wellington.

The Royal New Zealand Foundation for the Blind (which provides services to over 12 500 people) is working in partnership with optometrists and ophthalmologists in an operational research programme to trial three integrated low vision services based in hospitals, in a bold attempt to establish them throughout the country.

The main constraints to developing quality low vision services in New Zealand are inadequate funding by the Government and the high cost of equipment.

Papua New Guinea

Demography and prevalence of blindness and low vision

Papua New Guinea (PNG) has an estimated population of 4.5 million. The causes of blindness and low vision include congenital cataract, corneal opacification from various causes, optic neuritis, post-malarial vision loss, retinitis pigmentosa, angle-closure glaucoma from a swollen cataractous lens, and retinal diseases of various causes.

The number of children with low vision is not known. Most of the known cases are due to congenital cataract. Most children with congenital cataract would remain untreated until older.

Clinical, educational and vocational services

Health care in general is still at a low level, and more than half of children are born without any medical supervision. Malnutrition is a problem in some areas. The services available for people with low vision are very limited. There are less than 10 ophthalmologists in the country, and not all of them are working full-time. Also, many of them work in the capital Port Moresby and so are effectively inaccessible to most of the population. There are about 30 eye care nurses who do basic refraction and treatment part-time and work independently of ophthalmologists, a handful of ophthalmic nurses working with ophthalmologists.

In Port Moresby, St John's Centre for the Blind deals with both children and adults with low vision. Callan Services for disabled persons, run by the Christian Brothers and funded by CBM, have a number of centres around the country which offer mobility help and some CBR for low vision persons and the blind; the main areas include Goroka, Wewak and Rabaul. They work with children for the most part. Braille and special education are also an important part of Callan Services. At the Mt Sion Centre for the Blind in Goroka, there is a hostel for blind and low vision children; there are currently 11 children in this hostel from different parts of the country. At Sion, children are moved towards integration into mainstream schools.

Low vision services are definitely in their infancy in PNG and, for the most part, low vision people are included with and treated as blind. Currently, the availability of LVDs is mainly by donation, e.g. from the Royal Blind Society in New South Wales. There is no local production of LVDs.

The major constraints include lack of trained human resources in low vision, cultural barriers about disabilities, difficulty of transport and accessing areas and people, inadequate infrastructure and lack of low vision equipment. There would also be a need to set up a reliable source of LVDs, whether from overseas or produced locally, that would also require funding.

*Philippines**Demography and prevalence of blindness and low vision*

Philippines has an estimated population of 70.7 million. Based on a national survey in 1995, the prevalence of blindness is 0.7% and low vision 1.95%. There are therefore an estimated 478 968 blind and about 1.3 million with low vision. Thus, the total number with visual impairment is 1.8 million. Of these, the number (approximately 25%) requiring low vision services is 453 309. There is a national plan for prevention of blindness.

The main causes of blindness and low vision are cataract, uncorrected refractive errors and glaucoma.

Clinical, educational and vocational services

There are 1000+ ophthalmologists and 1200 optometrists in the country.

In the special education sector, there are 293 special education teachers who work mostly in government or public schools. There are seven rehabilitation centres and a CBR programme run by the Department of Health.

The major organizations working for the visually impaired include the Department of Health and Education, the Department of Culture and Sports, the Philippine Academy of Ophthalmology, the Integrated Philippine Association of Optometrists, the Philippine Blind Union, the Philippine Normal University, Resources for the Blind, the National Council for the Welfare of Disabled Persons, and CBM.

There are national training programmes for ophthalmologists, special education teachers and optometrists. Low vision training has to be obtained in other countries. The major constraints include insufficiency of trained human resources to provide low vision services, and inadequate services.

Republic of Korea

Demography and prevalence of blindness and low vision

Republic of Korea has an estimated population of 45.7 million. Based on a national survey in 1980, the prevalence of blindness is 0.3% and low vision 1.2%. There are therefore an estimated 135 000 blind and about 540 000 with low vision. Thus, the total number with visual impairment is 675 000. Of these, the number (approximately 25%) requiring low vision services is 168 750. There is a national plan for prevention of blindness.

The main causes of blindness are cataract, glaucoma and corneal scar, while the causes of low vision are optic atrophy (including glaucoma), retinal disease, retinopathy of prematurity and high myopia.

Clinical, educational and vocational services

There are 1813 ophthalmologists, 600 ophthalmic nurses, 400 ophthalmic paramedics and 5000 opticians in the country. There are no optometrists.

In the special education sector, there are 13 special education centres for visually impaired and blind children and seven institutions for blind adults. Eye care services are provided at seven major hospitals, while social rehabilitation and vocational training are limited to three centres, with 600 beneficiaries annually. A small and rudimentary CBR programme has been initiated in Seoul (telephoning-counselling).

There are national training programmes for special education teachers, ophthalmologists and ophthalmic paramedics. Most LVDs have to be imported.

The major constraints include low awareness of low vision in the professional sector as well as in the general public, scarcity of skilled human resources in low vision and in psychological and vocational rehabilitation, poor networking between different service providers, lack of LVDs and lack of a comprehensive and well-organized rehabilitation centre.

Singapore

Demography and prevalence of blindness and low vision

Singapore has an estimated population of 3.4 million with a life expectancy of 63 years. Based on data from the Singapore Association of the Visually Handicapped (SAVH), there were 1964 registered visually handicapped persons in 1999. Of these, the number (approximately 25%) in need of low vision services is 491.

The main causes of blindness and low vision are glaucoma, retinitis pigmentosa, optic nerve disease and diabetic retinopathy.

Clinical, educational and vocational services

There are 82 ophthalmologists, 414 optometrists and 72 ophthalmic nurses in the country.

In the special education sector, there are nine special education teachers. The Singapore School for the Visually Handicapped (SSVH) is the only special education centre, and there are four integrated education centres. There is only one vocational training centre, at SAVH. SAVH also runs the only CBR programme in Singapore, in which between 500 and 600 clients are seen per year.

Low vision services are provided by SAVH, SSVH and the Singapore National Eye Centre. The BizLink centre provides assessment for job placements. All LVDs are imported.

There are training programmes for ophthalmologists, special education teachers, optometrists and ophthalmic paramedics. The major constraints include lack of professional expertise in low vision work,

training and research, low awareness about low vision and visual impairment, and client resistance and reluctance towards rehabilitation.

Viet Nam

Demography and prevalence of blindness and low vision

Viet Nam has an estimated population of 76.5 million. Based on a national survey in 1995, the prevalence of blindness is 1.25% and low vision 5.78%. There are therefore an estimated 0.95 million blind and about 4.4 million with low vision. Therefore, the total number with visual impairment is 5.35 million. Of these, the number (approximately 25%) requiring low vision services is 1.34 million. There is a national plan for prevention of blindness.

The main causes of blindness and low vision are cataract, retinal disease, glaucoma and trachoma-related corneal opacity.

Clinical, educational and vocational services

There are 810 ophthalmologists, 1000+ ophthalmic nurses and 7200+ primary eye care workers in the country.

In the special education sector, there are 128 special education teachers. There are 25 education centres for disabled children, nine of these having integrated education and 16 providing special education, and 56 vocational training classes in 11 of the 25 centres. The centres are supported by the Provincial Education Department (PED), the Provincial Invalid and Social Affairs Department (PISA) and the Provincial Association for the Blind (PAB). With support from CBM, low vision services are now being set up in the provinces of Ho Chi Minh City, Danang, Nghe An, Thai Binh, Hai Phong and Thai Nguyen.

Vocational training is implemented by the Vietnam Association for the Blind (VAB), which is supported by the Vietnamese Government. It has branches in 33 cities and 257 sub-branches at district level. In addition, there are other vocational training centres in seven provinces. More than 1000 training courses in Braille, for more than 15 000 blind people, have been held in provinces and districts. More than 1000 of these people are small blind children who attended pre-integrated classes. At present, there are about 500 blind children who are integrated with sighted children in schools. The Association in provinces has a microcredit programme of low interest loans (<0.4%) for the blind, to develop family economy. Since 1992, there have been 42 000 loans from the Government, with a total of 18.230 billion VND.

Training courses on low vision are conducted for ophthalmologists, ophthalmic nurses and teachers at the National Institute of Ophthalmology. In Viet Nam, availability of LVDs is limited, and many have to be imported. The major organizations working for the visually impaired include the National Institute of Ophthalmology, the Hanoi School for the Blind, and VAB. The main constraints include lack of awareness of low vision amongst the eye care professionals and the general public, paucity of trained human resources and lack of affordable LVDs and equipment.

CONCLUSIONS AND RECOMMENDATIONS

Introduction

The Asia Pacific region includes three WHO/IAPB regions (part of the Eastern Mediterranean Region, the South-East Asia Region and the Western Pacific Region). It is home to half of the world's population and has a disproportionate share of the global burden of visual disability.

At this workshop, some 65 participants from 22 countries, including the nongovernmental organizations and professional bodies represented, formulated the following conclusions and recommendations.

Service delivery

1. There is a great and urgent need to expand access to low vision care in Asia Pacific. According to available information, it seems that overall less than 5% of the population is presently covered in the developing countries.
2. Low vision care must be an integral part of health, educational and rehabilitation services provided; it should be a clearly defined activity at primary, intermediary and tertiary levels of health care in each country. Particularly for children, wherever feasible, low vision services should be part of special/integrated/inclusive education and school health programmes.
3. Each country should include in its national programme planning for VISION 2020 a proper component of low vision care in parallel with the development of refractive error services, providing the services needed at an affordable cost by means of appropriate technology and aiming to reach all those in need.
4. Low vision care should, as a minimum, include proper techniques for (i) assessment of low vision, (ii) prescription of and access to optical devices, and (iii) skills training. It should be based on a team approach bringing together elements of eye care, education, rehabilitation and social services.
5. Low vision services are presently offered by the eye care, education and rehabilitation sectors. It is recommended that networking of these different service providers be encouraged within each country to ensure optimum and efficient utilization of existing resources.

Human resource development

6. The cadres of personnel involved in the provision of low vision care vary from country to country. It is recommended that each country identify appropriate personnel at each level of service delivery and structure training programmes accordingly.
7. Regional centres for low vision care should be identified in Asia Pacific to serve as resource institutions for training of trainers/personnel, standardization of curricula and development of technology. Countries should collaborate with those centres, and between each other, for optimal use of available resources.

Technology

8. The feasibility of establishing low vision care in the developing countries will depend largely on appropriate technology for devices needed. Local capacity for production or assembling of LVDs should be considered for all items possible, to reduce costs. Countries and NGOs could collaborate as appropriate to achieve this.

9. Many LVDs and assessment materials may be obtained or developed at particularly low prices if bulk purchases are made. It is therefore recommended that one to two agencies in Asia Pacific take on the role of a clearinghouse, centralizing purchases of such items as a common facility for the region. The participating organizations and users of such a facility should all contribute to the start-up and running costs, although a revolving fund could eventually be envisaged. Efforts to develop simple methods, such as the “first aid kit” (low vision handbag) for assessment of the required magnification, in field conditions, should be encouraged and their feasibility for use evaluated.

Advocacy

10. Lack of awareness about low vision care is a common constraint, amongst both health personnel and the public. It is therefore recommended that suitable material be developed for awareness campaigns. This could be taken on (i) by APAO for ophthalmologists, (ii) by corresponding professional bodies for other eye care staff, and (iii) by one or several institutions in the region for public education, with input also from interested NGOs.

Monitoring and evaluation

11. Monitoring and evaluation (including audit) of low vision care in Asia Pacific will be of increasing importance as more projects develop in countries. It is strongly recommended that monitoring and evaluation be part of planned project developments within VISION 2020, focusing on access and affordability of services and equipment.
12. The elaboration of national action plans for low vision care within the VISION 2020 Plan should include proper costing of needed services and facilities. NGOs and other interested parties should actively participate in and support this planning and subsequent implementation.

Regional support

13. There is considerable benefit in regional interaction in catalysing further development. It is recommended that a working group be formed to follow up and facilitate the implementation of the above recommendations.

PROPOSED REGIONAL ACTION PLAN ON LOW VISION SERVICES AS AN INTEGRAL PART OF VISION 2020 – THE RIGHT TO SIGHT

The Regional Action Plan for the development of services for low vision care, within the context of VISION 2020, could include the following:

- Providing guidance and support for the planning, development and implementation of the various components of low vision services as an integral part of national VISION 2020 action plans (see Annex 5 for model plan).
- Monitoring and evaluation of the Regional Action Plan.
- Inclusion of a low vision care expert support group within the WHO/IAPB Regional Coordination Group.
- Promoting the development of both regional and, where necessary, interregional linkages between national centres specialized in the development and implementation of low vision services.
- Mobilizing resources to support the necessary action.

Proposed Regional Action Plan on Low Vision

	2001	2002	2003
WHO/IAPB* Regional Coordination Group (RCG)** Suggested actions	<p>Submit Asia Pacific Low Vision Workshop report to IAPB/TF and WHO</p> <p>Convene Low Vision Working Group</p> <p>Establish low vision subcommittee in RCG, co-opting external experts as necessary</p> <p>VISION 2020/RCG to ascertain interest of countries in developing low vision services</p> <p>VISION 2020/RCG to identify expertise to support countries in including low vision in national VISION 2020 plans of action (STC) with external experts if needed</p> <p>MONITORING</p>	<p>Provide technical support for national VISION 2020 low vision services plan development within VISION 2020 plans of action (prepare guidelines)</p> <p>MONITORING</p>	<p>MONITORING</p>

* EMR; WPR

** SEAR

	2001	2002	2003
TRAINING	<p>VISION 2020 Coordinator/RCG to identify needs in terms of:</p> <ul style="list-style-type: none"> – human resource development – infrastructure strengthening – preparing regional (EMR, SEAR, WPR) project proposal based on above for submission to IAPB <p>VISION 2020 Task Force and other donors</p> <p>Identify centres for training of national focal persons and master trainers</p> <p>Seek agreement of institutions</p> <p>Strengthen training institutions as necessary</p> <p>Identify and establish mechanism for bulk purchase of LVDs</p> <p>Establish resource centre for information exchange and LVD procurement</p>	<p>Convene interregional workshop for common curriculum development</p> <p>Arrange training of national focal persons and master trainers courses in identified centres</p> <p>Identify and seek agreement of selected country</p>	<p>Support countries in national training courses</p> <p>Support countries in infrastructure development and strengthening</p>

MATRIX INDICATING INGO PRESENCE IN ASIA PACIFIC

Country	Prevention of blindness	Community-based rehabilitation	Integrated education	Low vision
Afghanistan	D&L			
Australia	FHF			
Bangladesh	CBM, SSI, HKI, ORBIS	D&L, CBM, SSI, HKI	CBM, HKI	CBM, HKI, SSI
Bhutan			CBM	
Cambodia	FHF, CBM, HKI	ICEVI, CBM	D&L, ICEVI	ICEVI
China	FHF, CBM, HKI	CBM	D&L, CBM	
Hong Kong				D&L
India	CBM, SSI, ORBIS	D&L, CBM, SSI	D&L, CBM, SSI	D&L, CBM, IEF
Indonesia	D&L, CBM, HKI	D&L, ICEVI, CBM	D&L, ICEVI, CBM	ICEVI, CBM
Japan				
Korea				
Lao PDR	CBM	ICEVI, CBM	D&L, ICEVI, CBM	ICEVI
Malaysia		ICEVI	ICEVI	ICEVI
Maldives				
Myanmar	CBM, HKI	ICEVI	ICEVI	ICEVI
Nepal	CBM, FHF	D&L, CBM, HKI	CBM	D&L, CBM
New Zealand				
Pakistan	FHF, CBM, SSI, D&L	SSI, D&L		SSI
Papua NG	CBM	CBM	CBM	
Philippines	CBM, HKI	ICEVI, CBM	D&L, ICEVI, CBM	ICEVI, IEF
Singapore				
Sri Lanka	SSI	CBM, SSI		SSI
Thailand	FHF, CBM	ICEVI, CBM	D&L, ICEVI, CBM	ICEVI, CBM
Tibet		D&L		
Uzbekistan			D&L	
Viet Nam	FHF, CBM	ICEVI, CBM	D&L, ICEVI, CBM	ICEVI, CBM

CBM: Christoffel-Blindenmission D&L: Dark & Light FHF: Fred Hollows Foundation
 HKI: Helen Keller Worldwide ICEVI: International Council for the Education of the Visually Impaired
 IEF: International Eye Foundation SSI: Sight Savers International

ANNEX 1

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ANNEX 2

AGENDA

Opening of Workshop
Election of Officers
Adoption of Agenda
Scope and Purpose

1. Low vision: international and regional perspectives
 - WHO's role in low vision care
 - VISION 2020 – Global Initiative
 - IAPB – global perspective
 - World Blind Union and low vision
 - Asia Pacific Academy of Ophthalmology – programme priorities
 - Asian Foundation for the Prevention of Blindness – report
2. Programme priorities in low vision care and the role of NGOs
 - Christoffel-Blindenmission (CBM)
 - Sight Savers International (SSI)
 - International Council for Education of the Visually Impaired (ICEVI)
 - Pan American Health Organization (PAHO)
 - Dark & Light
 - Lighthouse International
 - International Eye Foundation (IEF)
 - Helen Keller Worldwide (HKI)
3. Low vision service delivery models
 - Service delivery models of low vision in developed countries
 - Service delivery models of low vision in developing countries
 - Requirements for setting up a low vision service for a population of 10 million people
 - Low-cost low vision devices
4. Low vision orientation
 - What is a low vision service?
 - What is a low vision clinic?
 - What is low vision assessment?
 - Prescribing low vision devices
 - Instruction and training in the use of low vision devices
5. Country presentations – current status and constraints
6. Development of a framework for an Asia Pacific Action Plan on Low Vision
7. Any other matters

Conclusions and Recommendations

Closure of workshop

ANNEX 3

WELCOME MESSAGE BY DR SERGE RESNIKOFF Coordinator, Prevention of Blindness and Deafness World Health Organization, Geneva, Switzerland

It gives me great pleasure, on behalf of the World Health Organization, to join the Organizing Committee of this Asia Pacific Regional Low Vision Workshop in welcoming you to this important workshop, the first of its kind, under the auspices of VISION 2020 – The Right to Sight.

The Asia Pacific region spans all the countries of two WHO Regions (South-East Asia and Western Pacific) and a part of the Eastern Mediterranean Region. It represents over half of the world's population and an even greater proportion of the global blindness burden. Unattended and unmanaged, low vision is an issue of public health magnitude, despite the avowed interest that WHO has had in this area. Over 20 years ago, a WHO meeting was held in Brussels, organized by the Regional Office for Europe and entitled "The Use of Residual Vision by Visually Disabled Persons". Interestingly, it was attended not only by Dr Björn Thylefors, who is a Special Adviser to this Hong Kong meeting, but also by the then Secretary/Registrar of IAPB, Dr V. Clemmensen.

Two later WHO meetings, held in Bangkok in July 1992 and in Madrid in July 1996, on low vision care in children and the elderly respectively, form the background to the present meeting. As all of you know, low vision care has been included under the "disease control" priorities in VISION 2020.

When cure is not possible, enhancement of residual function through low vision care should be made available, through a multidisciplinary approach. I am confident that this present meeting, which includes participants with an interest and expertise in low vision, from both the regional Member countries and beyond, would come up with practical and realistic action plans that could begin to be implemented in the various Member countries. Needless to say, the issues of availability, accessibility, appropriate technology and affordability of low vision care should form the underlying basis for these action plans.

I wish participants a fruitful meeting, and we in WHO will look forward with great interest to the outcome of this workshop.

Thank you.

ANNEX 4

ADDRESS BY DR HANNAH FAAL
President, International Agency for the Prevention of Blindness

Honourable Chairman of the Asian Foundation for the Prevention of Blindness, Mr Clive Oxley, Mrs Susan Chan, Deputy Director of Hospital Authority and Mrs Grace Chan and all members of the Organizing Committee. It is indeed a real personal pleasure and privilege for me to be here in Hong Kong and at an international low vision meeting, a first for me on both counts. I thank you most sincerely for inviting me. I also bring greetings from Africa and from the IAPB Executive Committee and its VISION 2020 Task Force members.

The International Agency for the Prevention of Blindness, a global agency, was founded by eye care professionals (the International Council of Ophthalmology) and the World Blind Union in 1975 and now includes constituencies of the nongovernmental organizations, other scientific disciplines, national governments and individuals.

The purpose is to promote and sustain a global campaign against all forms of avoidable blindness, particularly in underserved communities.

Two years ago, IAPB, especially its NGO constituency with WHO, launched VISION 2020 – The Right to Sight, an ambitious but realistic action/initiative to eliminate avoidable blindness by the year 2020. This was done in the awareness of the issues linking health, disability, human rights and human development.

The initiative has three main pillars or components:

- Disease control
- Human resource development to do the work
- Infrastructure and appropriate technology – the wherewithal for them to do so

Within disease control, in recognition of the huge number need for refractive error and low vision services, this was included as one of the top five priorities. Strategies have been developed for disease control and this workshop, sponsored within the VISION 2020 framework, is to address low vision.

Statistics for numbers of blind or with low vision are quoted in millions; but if elimination is to be achieved, it needs to happen person by person, family by family, action local and community-directed. The public that we serve expect a full spectrum of services:

- Health promotion
- Disease prevention
- Disease control
- Services for disability

This requires from us an interpreted comprehensive programme of eye care, low vision services, education and rehabilitation. Low vision services, more than any other, demand an interpreted multisectoral approach – service providers together, the global partnership in VISION 2020 replicated at all levels to deliver, enabling government policies put in place.

It is hoped that this workshop will in programmatic terms provide a template for low vision services for a VISION 2020 service delivery unit of 500 000 to 1 million population in a developing and under-resourced country.

Gathered here today are representatives in the Asia Pacific – three WHO/IAPB regions, 22 countries, a mixed bag in population sizes, development. This workshop will identify strategies for coordination and pooling and sharing of resources within and between regions for action at national and local levels.

In addressing refractive errors and low vision, more than any other area in VISION 2020, there will be a demand for patient-related technology for glasses, low vision devices and environmental modification. The challenge will be to bring in non-traditional stakeholders and players such as industry.

Low vision is about making the most of what is left, it is about enhancement, it concerns children and the elderly, it bridges the medical, educational and rehabilitation sectors, a necessary link in providing the full spectrum of services and facilitating the establishment of linkages.

I wish us all very dynamic and constructive deliberations.

ANNEX 5

ESTABLISHING A LOW VISION SERVICE FOR 10 MILLION PEOPLE

Jill Keeffe
Centre for Eye Research Australia

Low vision services should be integrated into the eye and health care, education and rehabilitation systems within a country. The aim of this presentation is to outline the processes to estimate the type and quantity of services needed to establish or enhance integrated low vision services in a region or country.

Prevalence of Low Vision

The number and distribution of services can be estimated from the prevalence of low vision, and the need for service by people with low vision. Population-based epidemiological surveys provide data on the prevalence and causes of vision impairment in a defined population. Many countries have recently conducted surveys of adults. Examples in Asia are the large studies in Bangladesh and India. In Australia the Visual Impairment Project (VIP) has been shown to be not only representative of the Australian urban and rural population, but the findings are similar to those in other developed countries (Table 1).

	Presenting visual acuity	Best-corrected visual acuity
<6/18	1.32%	0.85%
<3/60	0.18%	0.17%

Table 1. Presenting and best-corrected visual acuity from the Australian Visual Impairment Project

The data from the VIP show the difference when presenting and best-corrected visual acuities are measured and reported. Presenting visual acuity is a person's "everyday" or functional acuity, that is with their current glasses or without. This compares with best corrected which is the visual acuity of those people with refractive error measured after refraction. The prevalence figures using best-corrected acuity exclude those people who can have their visual acuity corrected to within the normal range. It is the best-corrected acuity that is the relevant one to estimate the number of people in need of low vision care.

As the prevalence of low vision is very low in children, population-based surveys are not common, but estimates are based on surveys in schools and registers. In the WHO report *Preventing Blindness in Children* (WHO/PBL/00.77) prevalence was reported as:

- 0.4 per thousand children in high-income regions
- 0.7 per thousand children in middle-income regions
- 0.9 per thousand children in low-income regions

In countries where there have not been population-based surveys, estimates can be made from studies in countries with similar demographic or economic characteristics. Grouping of countries by the proportion of children in the population will help to estimate the number of children with low vision using the figures from *Preventing Blindness in Children*. The presence of age-related eye disease causing low vision, such as age-related macular degeneration and glaucoma, can be estimated with knowledge of the life expectancy within a particular population or country. Data from the *World Health Report 2000* were used to group some countries in the Asia Pacific region (Table 2).

Proportion of Children in the Population	
‡ 40% children	20%-30% children
Life expectancy <60	Life expectancy to approx 70
Cambodia	China
Lao PDR	Malaysia
Bangladesh	
Papua New Guinea	Life expectancy >70
Life expectancy approx. to 69	Korea
Indonesia	New Zealand
Pakistan	Australia
Philippines	Singapore
Viet Nam	Japan

Table 2. Some countries from the Asia Pacific region grouped according to the proportion of children in the total population and life expectancy (Source: *World Health Report 2000*)

Another source of estimation of the number of people with low vision is from the data summarized in the WHO publication *Global Data on Blindness: Update 1994* (Thylefors, Négrel, Pararajasegaram & Dadzie). The estimate of the number of people with low vision is that there are three times the number with low vision than there are people who are blind (visual acuity <3/60).

It is important to distinguish between the different definitions of blindness and low vision. The WHO definitions to be used in surveys define low vision as visual acuity less than 6/18 to 3/60 and blindness as less than 3/60. At the consultation on low vision held in Bangkok the definition adopted was that low vision was vision less 6/18 to light perception (*Management of Low Vision in Children*, WHO/PBL/93.27). Notes on the definition included the statement that the definitions should not be used to determine eligibility for service. Work in Malawi demonstrates that many children with low vision would not be included in low vision programmes if the definition of blindness of visual acuity of less than 3/60 were used (Table 3).

Using the functional definition, many children who have low vision but who have visual acuity less than 3/60 are included in low vision programmes. Using this example from Malawi 209/391 (53%) might not be included whereas the use of the functional definition would include an additional 53 children who could have usable vision, need refraction and benefit from low vision services.

Definitions		Number of children
ICIDH	<6/18 – 3/60	182
	<3/60	209 (53%)
Functional	<6/18 – PL	235
	NPL	156 (40%)

Table 3. Comparison of the numbers of children who would be included in low vision programmes using the different definition of low vision (*unpublished data, van Dijk and Keefe*)

Need for Low Vision Care

Not all people with low vision will need low vision services nor will they need the same type and intensity of service. Results of research using a questionnaire to establish peoples' needs for low vision care indicate that some people with low vision do not require low vision services and that those who need them will have differing needs for the type and amount on intervention (Figures 1a, 1b, 1c).

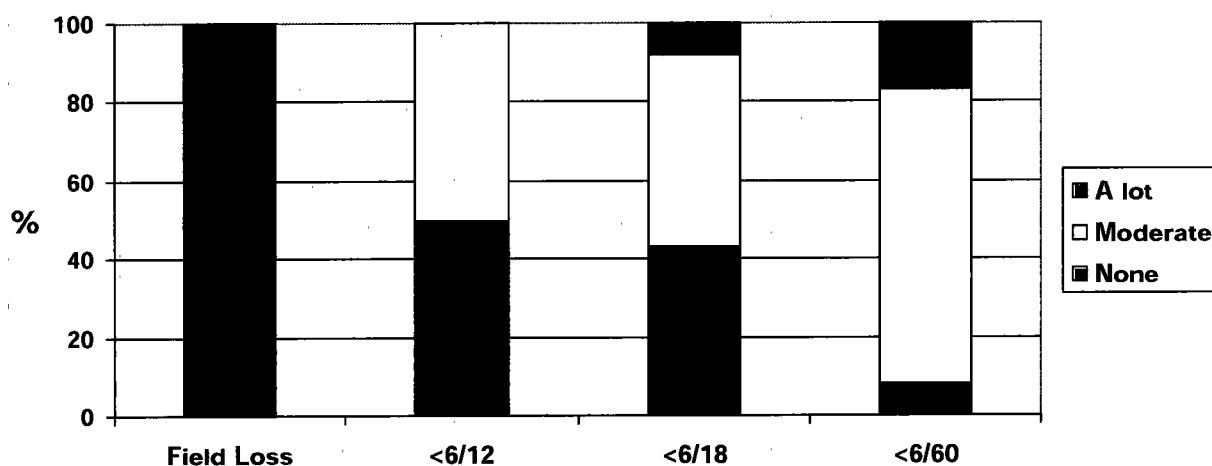


Fig 1a. Total scores on Impact of Vision Impairment (IVI) profile in relation to visual acuity of people who have not experienced any low vision services

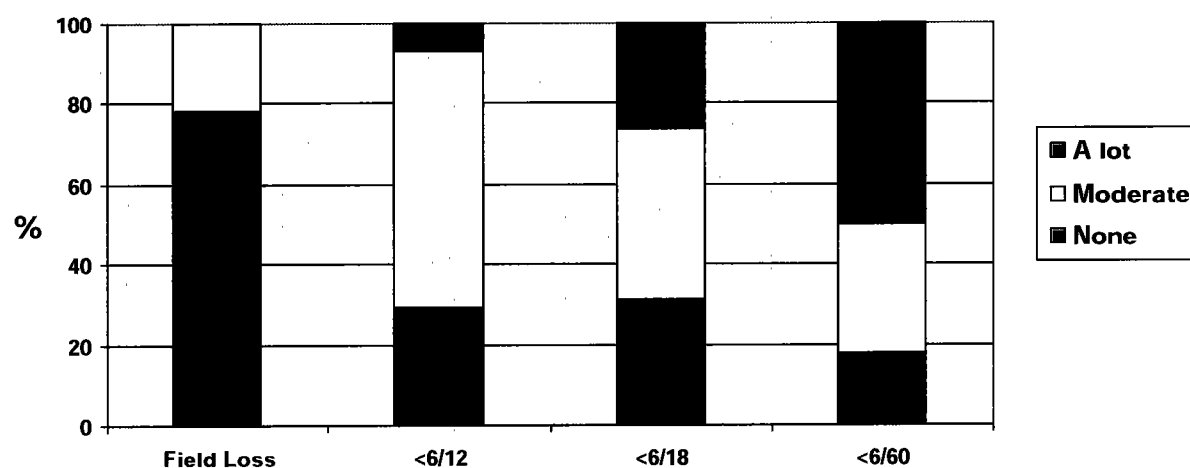


Figure 1b. Relationship of visual acuity to concerns about performance of mobility Activities reported from the IVI:

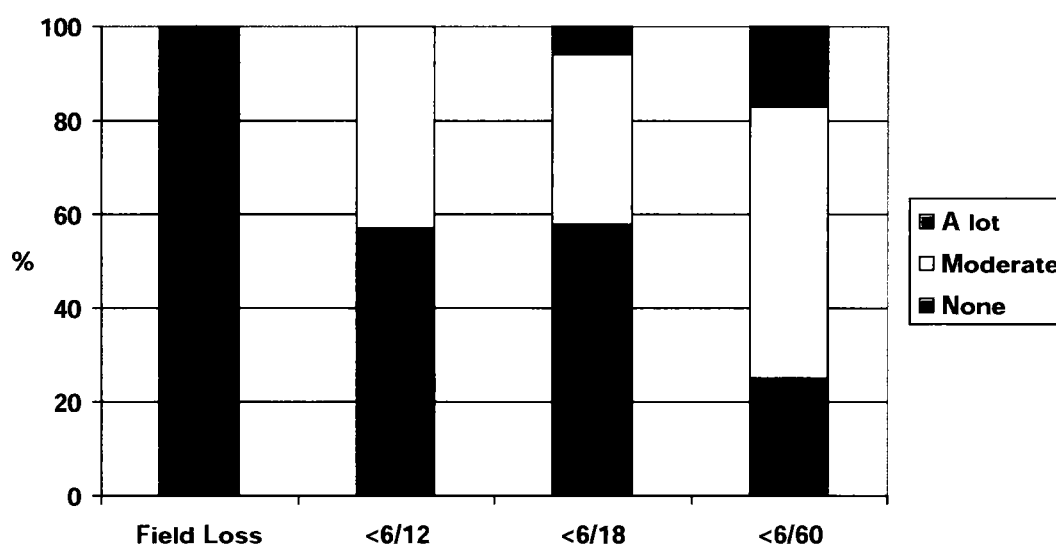


Figure 1c. Relationship of visual acuity to concerns about performance on household and personal care activities reported from the IVI.

From Figure 1a the IVI results indicate that almost half of the people with visual acuity in the categories <6/12 – 6/18 and <6/18 – 6/60 report little or no problems with activities due to their vision so would not need referral for low vision care. Almost 10% of people with visual acuity <6/60 also report little or no difficulty. Figures 1b and 1c show that the difficulty reported is not the same for all types of activities. These results confirm that visual acuity alone should not be used to determine if a person needs low vision services. It also demonstrates that prevalence figures cannot be used to determine the population in need of services.

We still do not have complete data to set exact targets to provide coverage for all people who need low vision care. An estimate would probably be that, at any one point in time, approximately 70% to 80% of people with low vision might benefit from low vision services.

Low Vision Services

The integration of low vision care into eye care, education and rehabilitation systems is the key to its success. The comprehensive range of activities in each of the levels of care is shown in Table 4.

	Activities	Personnel
Primary Community-based	Awareness Screening Referral Basic rehabilitation	Primary health care (PHC)/ primary eye care (PEC) Community-based rehabilitation (CBR) Teachers
Secondary	Diagnosis and treatment Refraction Low vision assessment Prescription of low vision devices (LVDs) and training	Ophthalmologist/ophthalmic medical assistant(OMA) Optometrist Orthoptist "Multi-skilled worker"
Tertiary	Diagnosis and treatment Low vision assessment Prescription of high-power and complex LVDs and skills training Referral and consultation with other professionals Training health, eye care, education and rehabilitation workers	Ophthalmologist Optometrist Orthoptist Teacher Rehabilitation specialists (O&M)

Table 4. The components of a low vision programme

Ideally a low vision programme will include all levels of care so that a comprehensive range of services is available to all irrespective of barriers to access (Table 4).

In some countries, low vision care has commenced with the establishment of clinics and services at the tertiary level. Here a team of specialists in low vision can provide a range of services to people with simple to complex needs for care.

An alternative is to start services by providing care at primary and secondary levels. In this way the case-finding through awareness and screening will take place in parallel with the establishment of regional clinics and service centres. A critical feature is the combination of outreach (community-based) services combined with clinical care. The people who can be involved in low vision care and are to be trained are listed in Table 4.

The decision on where to start will depend on priorities for care such as coverage, facilities and strengths in the health, education and rehabilitation system.

It is estimated that one tertiary-level centre could cater for a population of 10 million people. Associated with this would be four regional (secondary) centres. At the secondary centres could be low vision specialists in education and rehabilitation who provide outreach or community-based services. At the primary level are health, education and rehabilitation workers who provide services to all in their area with people with low vision integrated into their communities.

Examples can illustrate how this works, first with teachers. At the primary level is a classroom teacher in a regular community school, who with on-the-job training can provide the basic needs for a student with low vision. From the secondary level is an itinerant teacher with training in low vision who provides specialized support to the classroom teacher, the students, their parents and the community. Teachers could provide support to approximately 15 children. At the tertiary level is a teacher who would work with the low vision team provision of care but also provide the management, support and training to teachers at the secondary level. This has a parallel in rehabilitation.

In eye care at the primary level is the health or eye care worker. The role in case-finding or screening to identify people with low vision is the same procedure as screening for people with cataract or refractive

error. What is needed is knowledge of the needs of people with low vision and referral networks. Services at the secondary level might be provided in an ophthalmic unit or hospital. In addition to existing skills in assessment, diagnosis, refraction, medical and surgical management need to be added those to enable prescription of low vision devices. The work of the ophthalmologist, refractionist would be complemented by a “multi-skilled” worker with knowledge of assessment and rehabilitation techniques.

Good data on the numbers of people who can be served at each level are still to be well defined. To provide coverage with appropriate services to all who need them, an estimate is 30:50:20 at each of primary, secondary and tertiary levels. There are some differences between children and adults. Very young children and those with multiple disabilities are more likely to need tertiary services. Older people are more likely to seek community-based services.

Conclusion

Low vision is a part of the spectrum of vision impairment and thus low vision services should not be separate from services to people who are blind. Essentially the same people and same organizations will provide care. Similarly in the provision of eye care, low vision is part of that care utilizing the same personnel (with training in low vision) and often using the same facilities. What is needed, to ensure low vision care for all who need it, is trained personnel to assess needs and provide specialized skill training for people with low vision and the special equipment and materials such as low vision devices.

ANNEX 6

COUNTRY PROFILE SUMMARY

Country	Population in millions UN 1999 estimates	Prevalence of blindness and magnitude of low vision	Number in need of low vision services	Main causes	Services for VI (clinical, educational, rehabilitative)	Human resources available for VI	Availability of and accessibility to LVDs
EMR Afghanistan	25.8	Blindness 1.2% Low vision 900 000	285 000	Cataract Refractive errors Glaucoma Corneal scars	<i>Clinical:</i> No. of eye beds 350 <i>Educational:</i> 5 schools for blind/VI <i>Rehabilitative:</i> 1 workshop 2 CBR programmes	50-55 ophthalmologists 3 optometrists 100 ophthalmic nurses and paramedics 33 resource teachers 120 field workers	No low vision service Access to optical services also limited
Pakistan	130	Blindness 1.78% Low vision 6 900 000	2 200 000	Cataract Corneal scars Refractive errors Glaucoma	<i>Clinical:</i> 20 tertiary eye care centres <i>Educational:</i> 63 schools for blind/VI <i>Rehabilitative:</i> 35 vocational training centres	1700 ophthalmologists 20 optometrists 400 ophthalmic nurses and MLP 300 resource teachers 40 000 lady health workers	Established 5 low vision clinics Good optical services available 2 optical workshops producing low-cost LVDs
SEAR Bangladesh	122	Blindness 1.4% (>30 years) Low vision 5 124 000	1 622 600	Cataract Macular degeneration Phthisis Optic atrophy	<i>Clinical:</i> Tertiary eye care centres <i>Educational:</i> Integrated education <i>Rehabilitative:</i> 2 vocational training centres 7 CBR programmes	Ophthalmologists Ophthalmic nurses and paramedics Resource teachers CBR workers	No low vision service 1 low vision clinic being set up in Chittagong Access to optical services also limited No optometrists
India	960	Blindness 1% Low vision 25 000 000	9 500 000	Cataract Corneal scars Refractive errors Glaucoma	<i>Clinical:</i> Tertiary eye care centres <i>Educational:</i> Schools for blind/VI <i>Rehabilitative:</i> Vocational training centres	Ophthalmologists Optometrists Ophthalmic nurses and paramedics Resource teachers CBR workers	Established low vision clinics Good optical services available Indigenous optical capacity and expertise to produce LVDs

Country	Population in millions UN 1999 estimates	Prevalence of blindness and magnitude of low vision	Number in need of low vision services	Main causes	Services for VI (clinical, educational, rehabilitative)	Human resources available for VI	Availability of and accessibility to LVDs
Indonesia	203	Blindness 1.5% Low vision 9 000 000	2 800 000	Cataract Optic nerve disease Refractive errors Retinal disease	<i>Clinical:</i> 10 tertiary eye care centres <i>Educational:</i> 47 schools for blind/VI <i>Rehabilitative:</i> Vocational training centres (few)	500 ophthalmologists 814 nurses and paramedics 438 resource teachers	Established 3 low vision clinics Good optical services available LVDs difficult to obtain
Maldives	0.26	Blindness 0.5% Low vision 4035	1277	Cataract Refractive errors Corneal scars	<i>Clinical:</i> 1 tertiary eye care centre <i>Educational:</i> No school for blind/VI <i>Rehabilitative:</i> No vocational training centre	6 ophthalmologists 2 optometrists 4 ophthalmic nurses	No low vision clinic Optical services available LVDs difficult to obtain
Nepal	22.5	Blindness 0.89% Low vision 600 000	190 000	Cataract Retinal disease Glaucoma Trachoma	<i>Clinical:</i> 3 tertiary eye care centres <i>Educational:</i> 33 special integrated schools <i>Rehabilitative:</i> 15 vocational training centres 9 CBR programmes	89 ophthalmologists 309 ophthalmic assistants	1 low vision clinic Optical services available 1 optical workshop that makes simple magnifiers
Sri Lanka	18.2	Blindness 0.42% Low vision 230 000	72 000	Cataract Glaucoma Macular degeneration Vitamin A deficiency	<i>Clinical:</i> 3 tertiary eye care centres <i>Educational:</i> 4 schools for blind/VI <i>Rehabilitative:</i> 2 vocational training centres 2 CBR programmes	25 ophthalmologists 20 ophthalmic technologists (refractionists) 200 ophthalmic nursing officers 4 orthoptists	No low vision clinic Optical services limited LVDs difficult to obtain

Country	Population in millions UN 1999 estimates	Prevalence of blindness and magnitude of low vision	Number in need of low vision services	Main causes	Services for VI (clinical, educational, rehabilitative)	Human resources available for VI	Availability of and accessibility to LVDs
Thailand	59	Blindness 0.3% Low vision 530 000	160 000	Cataract Glaucoma Macular degeneration Vitamin A deficiency	<i>Clinical:</i> Tertiary eye care centres available <i>Educational:</i> Integrated education <i>Rehabilitative:</i> Vocational training centres	584 ophthalmologists 15 optometrists 400 ophthalmic nurses	Widespread low vision services
WPR Australia	18.2	Blindness 0.42% Low vision 230 000	72 000	Cataract Glaucoma Macular degeneration	<i>Clinical:</i> Tertiary eye care centres <i>Educational:</i> Integrated education <i>Rehabilitative:</i> Vocational training centres	Ophthalmologists Optometrists Resource teachers	Established low vision clinics Optical services well developed LVDs available
Cambodia	10.5	Blindness 1.2% Low vision 360 000	110 000	Cataract Corneal opacity Refractive errors Glaucoma	<i>Clinical:</i> Tertiary eye care centres <i>Educational:</i> ? <i>Rehabilitative:</i> ?	32 ophthalmologists 8 optometrists 79 ophthalmic nurses	No low vision clinic Optical services limited LVDs difficult to obtain Low-cost optical workshops in 4 provinces Primary eye care programme in progress
China	1243	Blindness 0.43% Low vision 7 200 000	3 100 000	Cataract Corneal opacity Trachoma Chorioretinal disease	<i>Clinical:</i> Several tertiary eye care centres <i>Educational:</i> 27 schools for blind/VI <i>Rehabilitative:</i> 900 rehabilitation centres	20 000 ophthalmologists 300 optometrists 16 000 ophthalmic nurses	Several low vision clinics Optical services widespread LVDs manufactured locally Major government initiative in rehabilitation

Country	Population in millions UN 1999 estimates	Prevalence of blindness and magnitude of low vision	Number in need of low vision services	Main causes	Services for VI (clinical, educational, rehabilitative)	Human resources available for VI	Availability of and accessibility to LVDs
Hong Kong	6.9	Blindness 0.48% Low vision 67 689	16 922	Cataract Retinal disease Glaucoma Diabetic retinopathy	<i>Clinical:</i> Few tertiary eye care centres <i>Educational:</i> 2 schools for blind/VI 2 integrated education centres <i>Rehabilitative:</i> 3 vocational training centres	195 ophthalmologists 1902 optometrists 40 special education teachers 65 integrated education teachers	Well-established low vision services Optical services widespread LVDs easily available
Japan	125.6	Visual impairment 0.24% Low vision 305 000	76 250	Glaucoma Diabetic retinopathy Retinitis pigmentosa Optic nerve disease	<i>Clinical:</i> Several tertiary eye care centres <i>Educational:</i> 70 schools for blind/VI Integrated education available <i>Rehabilitative:</i> 2 training centres for rehabilitation workers	11 408 ophthalmologists 350 rehabilitation workers	Well-established low vision services Optical services widespread LVDs manufactured locally
Lao PDR	5.1	Blindness 1% Low vision 153 000	48 450	Cataract Corneal opacity Glaucoma Retinal disease	<i>Clinical:</i> 1 tertiary eye care centre <i>Educational:</i> Integrated education <i>Rehabilitative:</i> 1 rehabilitation centre CBR programmes in 6 districts of 2 provinces	6 ophthalmologists 7 cataract surgeons 5 refractionists 94 ophthalmic nurses 3 special education teachers	No low vision clinic Optical services limited LVDs difficult to obtain Primary eye care programme in progress

Country	Population in millions UN 1999 estimates	Prevalence of blindness and magnitude of low vision	Number in need of low vision services	Main causes	Services for VI (clinical, educational, rehabilitative)	Human resources available for VI	Availability of and accessibility to LVDs
Malaysia	21	Visual impairment 0.29% Low vision 573 300	136 158	Cataract Macular degeneration Corneal opacity Retinal disease	<i>Clinical:</i> Several tertiary eye care centres <i>Educational:</i> 3 schools for blind/VI 22 integrated education programmes <i>Rehabilitative:</i> 3 vocational training centres	230 ophthalmologists 500 optometrists 20 ophthalmic paramedics 13 000 opticians 181 special education teachers	Well-established low vision services Optical services widespread LVDs manufactured locally
New Zealand	3.6	Significant vision problems 32 000 Low vision ?	?	Cataract Macular degeneration Corneal opacity Retinal disease	<i>Clinical:</i> Few tertiary eye care centres <i>Educational:</i> ? schools for blind/VI ? integrated education programmes <i>Rehabilitative:</i> ? vocational training centres	72 ophthalmologists 350 optometrists 6 orthoptists	3 integrated low vision services being piloted Optical services limited LVDs difficult to obtain
Papua New Guinea	4.5	Blindness ?% (not available) Low vision ? (not available)	?	Cataract Corneal opacity Optic nerve disease Retinal disease	<i>Clinical:</i> 1 tertiary eye care centre <i>Educational:</i> 1 school for blind/VI <i>Rehabilitative:</i> A few CBR programmes	10 ophthalmologists 30 eye care nurses (also do refraction)	No low vision clinic Optical services limited LVDs difficult to obtain
Philippines	70.7	Blindness 0.7% Low vision 1 300 000	453 309	Cataract Refractive errors Glaucoma	<i>Clinical:</i> Few tertiary eye care centres <i>Educational:</i> Integrated education <i>Rehabilitative:</i> 7 rehabilitation centres 1 CBR programme	1000+ ophthalmologists 1200 optometrists 293 special education teachers	Low vision services available Optical services well established LVDs difficult to obtain

Country	Population in millions UN 1999 estimates	Prevalence of blindness and magnitude of low vision	Number in need of low vision services	Main causes	Services for VI (clinical, educational, rehabilitative)	Human resources available for VI	Availability of and accessibility to LVDs
Republic of Korea	45.7	Blindness 0.3% Low vision 540 000	168 750	Cataract Glaucoma Corneal scar	<i>Clinical:</i> Few tertiary eye care centres <i>Educational:</i> 13 special education centres 7 centres for adults <i>Rehabilitative:</i> 3 vocational training centres 1 small CBR programme	1813 ophthalmologists 600 ophthalmic nurses 400 ophthalmic paramedics 5000 opticians	Low vision services limited Optical services well established LVDs difficult to obtain No optometrists
Singapore	3.4	1964 registered visually handicapped persons	491	Glaucoma Retinitis pigmentosa Optic nerve disease Diabetic retinopathy	<i>Clinical:</i> Few tertiary eye care centres <i>Educational:</i> 1 special education centre 4 integrated education centres <i>Rehabilitative:</i> 1 vocational training centre 1 CBR programme	82 ophthalmologists 414 optometrists 72 ophthalmic nurses 9 special education teachers	Low vision services well established Optical services well established LVDs easily available
Viet Nam	76.5	Blindness 1.25% Low vision 4 400 000	1 340 000	Cataract Retinal disease Glaucoma Trachoma	<i>Clinical:</i> Few tertiary eye care centres <i>Educational:</i> 16 special education centres 9 integrated education centres <i>Rehabilitative:</i> 11 education centres with vocational training classes Vocational training in 33 cities 1 CBR programme	810 ophthalmologists 1000+ ophthalmic nurses 7200+ primary eye care workers 128 special education teachers	Low vision services limited Optical services limited LVDs difficult to obtain

ANNEX 7

LOW VISION SERVICES DEVELOPMENT ACTION PLAN

COUNTRY MATRIX

Important note for readers:

The views expressed in these draft country action plans are those of the participants of the Asia Pacific Regional Low Vision Workshop and do not necessarily reflect national or government priorities or commitments. These serve only as a guide and would have to be approved or modified by the relevant national fora and VISION 2020 committees in the respective countries.

Country	Strategic programming component	Strengths	Constraints and weaknesses in existing programmes	Key objectives (what is wanted)	Strategies (how it will be done and by whom)	Regional support required	Timing framework 2002-2006
EMR Afghanistan	Service delivery	Special education teachers and field workers	No low vision assessment No national programme	Develop low vision centres Develop a national programme	Lead NGOs to support setting-up of low vision clinics Networking and coordination with Government to think of a national programme	Technical support to set up clinics Facilitation and advocacy to formulate a national programme	2002
	Human resource development: <i>Human resource needs, identification of appropriate teams</i>	CBR approach	No low vision training programme	Train optometrists, ophthalmic paramedics, low vision teachers, CBR workers	Train optometrists, ophthalmic technicians, teachers in centres in Pakistan	Sponsorship to train human resources outside Afghanistan	2002-2006
	<i>Curriculum standardization</i>	Implemented in November 2002	Government support required	Permission from government agencies for implementation	Through coordination and networking meetings		
	<i>Training opportunities available</i>	In-service training	No formal training opportunities available	Develop a CBR training programme	Use existing CBR programmes as a base	Technical and material support to set up a CBR programme	2003-2006
	<i>Technology: LVD procurement opportunities and production capacity</i>	Available from Pakistan	Only some low vision spectacles produced locally	Develop an optical workshop	Train opticians/optical technicians and equip optical workshop	Sponsorship for training and equipping of workshop	2002

Country	Strategic programming component	Strengths	Constraints and weaknesses in existing programmes	Key objectives (what is wanted)	Strategies (how it will be done and by whom)	Regional support required	Timing framework 2002-2006
Pakistan	Service delivery	National Plan for Prevention of Blindness based on 3-tier system Tertiary and secondary eye care services National low vision action plan	Inadequate equity and coverage Insufficient coordination between service providers	Develop 5 more low vision clinics and extend low vision services to the secondary level (districts)	Strengthen existing infrastructure and pilot extension to secondary level	Policy guidelines Standardized basic and advanced low vision kits for the secondary and tertiary levels respectively	Complete tertiary centres by 2003 Pilotting by 2002 Replication in 10 districts by 2006
	Human resource development: <i>Human resource needs, identification of appropriate teams</i>	Ophthalmologists Mid-level personnel (MLP) Special education teachers	Districts have no trained low vision personnel Few centres available for HRD	Train MLP in low vision for districts and optometrists for tertiary centres	National training centres to train MLP and optometrists	Support in training of master trainers Support in extension of comprehensive eye care to remaining districts	50 MLP to be trained in low vision by 2006 20 optometrists to be trained by 2006
	<i>Curriculum standardization</i>	Special education teachers curriculum standardized MLP curriculum standardized	Lack of standardization of optometry and medical undergraduate curriculum	Standardize curriculum for optometrists and include low vision in undergraduate training	Curriculum standardization workshops	Support to hold curriculum standardization workshops	2002
	<i>Training opportunities available</i>	Training programmes for all cadres available nationally 2 optical workshops producing LVDs Technical expertise available locally	Training programmes for MLP not present in all provinces 2 workshops not enough for national needs	MLP programme to be established in each province Develop one optical workshop in each province Develop low-cost assessment materials	Use standard curriculum to start programme Train opticians/optical technicians and equip optical workshop Research and development to produce assessment materials	Sponsorship of in-service candidates Sponsorship for training and equipping of workshops Research and development capacity for further improvement	Train at least 300 MLP by 2006 Set up 3 optical workshops by 2006 Affordable assessment materials developed and tested by 2003
	<i>Technology: LVD procurement opportunities and production capacity</i>						

Country	Strategic programming component	Strengths	Constraints and weaknesses in existing programmes	Key objectives (what is wanted)	Strategies (how it will be done and by whom)	Regional support required	Timing framework 2002-2006
SEAR Bangladesh	Service delivery	Components of low vision services available minimally National survey done in 2000, data on low vision magnitude available	No low vision service exists	Develop 3 tertiary, 12 secondary and 48 primary low vision centres	Include low vision in national plan Public-NGO partnership Appoint national low vision coordinator	Consultancy to develop low vision plan	2002-2006
	Human resource development: <i>Human resource needs, identification of appropriate teams</i>	Ophthalmologists Teachers Social workers	Lack of low vision component in training	Orientation of ophthalmologists in low vision Optometry and low vision training for medical assistants	Working group to formulate strategies for inclusion of low vision in primary-, secondary- and tertiary-level training programmes	Consultancy and technical support	2002-2006
	Curriculum standardization	Curricula for all eye care professionals present	Curricula lack standardization	Standardize curricula for all eye care professionals	Formation of interdisciplinary working group	Consultancy and support to hold curriculum standardization workshops	2002
	Training opportunities available	Training programmes for special education and rehabilitation available nationally	No low vision training programme for refractionists and medical assistants	Low vision training of refractionists and medical assistants	Special course for refractionists and medical assistants	Support for training of trainers	2002-2006
	Technology: <i>LVD procurement opportunities and production capacity</i>	Materials for low-cost LVDs available locally	Technology and expertise for production of LVDs not available	Develop 3 optical workshops, one to each of the tertiary low vision centres	Train opticians/optical technicians and equip optical workshop	Consultancy for training and support for equipping of workshops	2002-2003

Country	Strategic programming component	Strengths	Constraints and weaknesses in existing programmes	Key objectives (what is wanted)	Strategies (how it will be done and by whom)	Regional support required	Timing framework 2002-2006
India	Service delivery	Service delivery centres	Inadequate equity and coverage Lack of awareness	Identify existing service providers Develop one tertiary centre for 10 million population Increase awareness	Integrate low vision services in eye care centres Infrastructure development Awareness material	Support for infrastructure development Networking Resource mobilization	Develop 10 tertiary centres by 2006
	Human resource development: <i>Human resource needs, identification of appropriate teams</i>	Ophthalmologists Optometrists Rehabilitation professionals Resource teachers CBR workers	Insufficient number and uneven distribution of trained human resources	Increase HRD in all cadres Identify need of professionals	Identify existing professionals (trainers) Training of trainers	Collaboration with other regional and international organizations/centres Resource mobilization	100 ophthalmologists, 2000 optometrists, 10 000 CBR workers and 5000 resource teachers to be trained in low vision by 2006
	<i>Curriculum standardization</i>	Curricula available for all cadres	Lack of standardization of curricula	Standardize curricula for all cadres	Identify strengths and weaknesses of existing training curricula	Collaboration with other organizations and centres	2002-2003
	<i>Training opportunities available</i>	Training programmes for all cadres available nationally	Insufficient optometrists Inadequate training programmes	Increase number of training programmes	Identify existing training programmes Develop training centres	Support for training programmes and networking	Develop 5 regional training centres
	<i>Technology: LVD procurement opportunities and production capacity</i>	Indigenous LVDs available at low cost and reasonable quality	Lack of high-power optical devices Poor information on locally available LVDs Imported LVDs expensive	Produce high-power optical devices Disseminate information about locally available LVDs	Set up production units and resource centres Collaboration for transfer of technology Create website	Collaboration for transfer of technology Support for setting up production units Assistance with bulk purchase	2002

Country	Strategic programming component	Strengths	Constraints and weaknesses in existing programmes	Key objectives (what is wanted)	Strategies (how it will be done and by whom)	Regional support required	Timing framework 2002-2006
Indonesia	Service delivery	Trained human resources Widespread service Early intervention	Limited capacity Limited data and statistics Limited networking with health and education institutions	Offer high-quality low vision services at affordable cost	Training of trainers Public-NGO partnerships		
	Human resource development: <i>Human resource needs, identification of appropriate teams</i>		Lack of master trainers	Training of human resources for low vision care	National training workshops for government health officials, health administrators, teachers, CBR workers		2002
	<i>Curriculum standardization</i>	Curricula available for all cadres	Improper selection procedures Poor coordination and networking between different training programmes	Linking training programmes with existing education and health institutions to ensure sustainability	Curriculum standardization workshops	Support to hold curriculum standardization workshops	2002
	<i>Training opportunities available</i>	Training programmes for all cadres available nationally	Training programmes for MLP not present in all provinces	MLP programme to be established in each province	National workshops for Ministries of Education and Health		2002
	<i>Technology: LVD procurement opportunities and production capacity</i>			Ensure availability of low-cost LVDs	Production scheduled to start in connection with special schools (future resource centres)		2002

Country	Strategic programming component	Strengths	Constraints and weaknesses in existing programmes	Key objectives (what is wanted)	Strategies (how it will be done and by whom)	Regional support required	Timing framework 2002-2006
Maldives	Service delivery	Existing primary health care and primary eye care programme	No low vision service available	Low vision care available as part of primary eye care	Incorporate low vision training in primary eye care programme		2003
	Human resource development: <i>Human resource needs, identification of appropriate teams</i>	Community health workers Ophthalmic nurses Ophthalmologists Refractionists	Lack of trained persons in low vision	Train available cadres in low vision	National workshops and seminars for training local staff	Technical assistance and support to hold training workshops	2002
	<i>Curriculum standardization</i>		No standard curricula available	Include low vision in curriculum for primary eye care workers	Train existing staff in low vision care	Develop standard curricula for existing cadres	2003
	<i>Training opportunities available</i>		No training programmes available				
	Technology: <i>LVD procurement opportunities and production capacity</i>		No locally available LVDs	Develop one optical workshop to produce low-cost LVDs	Train optical technician to make LVDs Arrangements to import LVDs	Technical assistance and support to set up optical workshop and procurement mechanism	2003

Country	Strategic programming component	Strengths	Constraints and weaknesses in existing programmes	Key objectives (what is wanted)	Strategies (how it will be done and by whom)	Regional support required	Timing framework 2002-2006
Nepal	Service delivery	Existing eye care infrastructure	Geographical terrain Lack of awareness	Low vision services available at all hospitals with eye departments	Public-NGO partnerships and coordination CBR		2002-2003
	Human resource development: <i>Human resource needs, identification of appropriate teams</i>	Existing human resources NGO support within country	Inadequate number of trained human resources	Train one resource person from each eye hospital	Train ophthalmic assistants and trainers (refractionists)	Support in training of master trainers and other cadres	By 2004
	<i>Curriculum standardization</i>	Refraction module in training of ophthalmic assistants	Lack of support to train more persons				
	<i>Training opportunities available</i>		No permanent training available within country	Set up training programmes to train refractionists	Local training at eye hospitals	Incorporate low vision in training of refractionists	Fully implemented by 2004
	<i>Technology: LVD procurement opportunities and production capacity</i>	Optical workshops within country can make a small range of low-cost LVDs	Imported devices expensive	Develop and strengthen existing optical workshops	Train opticians/optical technicians and equip optical workshops	Sponsorship for training and equipping of workshops	Completed in all 4 regions by 2005

Country	Strategic programming component	Strengths	Constraints and weaknesses in existing programmes	Key objectives (what is wanted)	Strategies (how it will be done and by whom)	Regional support required	Timing framework 2002-2006
Sri Lanka	Service delivery	Network of regional hospitals	Inadequate equity and coverage	Develop 3 low vision clinics and extend low vision services to the periphery	Strengthen existing infrastructure and set up low vision clinics in tertiary centres	Technical assistance for planning of low vision services and support to set up low vision clinics	2002-2006
	Human resource development: <i>Human resource needs, identification of appropriate teams</i>	Ophthalmologists Ophthalmic nurses Ophthalmic technologists	Lack of awareness No trainers in low vision available	Train master trainers in low vision Train one ophthalmic technologist in low vision for each tertiary centre	Training of trainers Low vision training of ophthalmic technologists	Support in training of master trainers and ophthalmic technologists	Train one master trainer in 2002, then 3 ophthalmic technologists every year until 2006
	<i>Curriculum standardization</i>	Ophthalmic technologist training programme	Lack of a low vision module in their curriculum	Conduct a low vision module for ophthalmic technologists	Develop a low vision module for ophthalmic technologists	Technical assistance to develop a low vision module for ophthalmic technologists Interregional meetings on curriculum development	2002
	<i>Training opportunities available</i>		No training programmes on low vision except for ophthalmic technologists	Develop low vision training in the ophthalmic technologists training programme Develop optical workshops	Use existing training course at Colombo Eye Hospital		
	<i>Technology: LVD procurement opportunities and production capacity</i>		No local production of LVDs		Train opticians/optical technicians and equip optical workshops Expand local production of simple LVDs at proposed centres	Sponsorship for training and equipping of workshops	Set up at least one optical workshop by 2002 Expand LVD production capacity by 2006

Country	Strategic programming component	Strengths	Constraints and weaknesses in existing programmes	Key objectives (what is wanted)	Strategies (how it will be done and by whom)	Regional support required	Timing framework 2002-2006
Thailand	Service delivery	Several low vision clinics Good system of prevention	Varying standard of low vision assessment	Upgrade standard of low vision units at tertiary and secondary levels	Refresher training National examination International exchange		
	Human resource development: <i>Human resource needs, identification of appropriate teams</i>	Networking between Government and NGOs	Paramedical teamwork not coordinated	Set up association of low vision persons	Disseminate data and information among medical, educational, social welfare departments and NGOs	Cooperation in research	
	<i>Curriculum standardization</i>	Standard curriculum for education teachers	Lack of standard low vision curriculum	Low vision management programme for children and adults	Package teaching at community level		
	<i>Training opportunities available</i>	Short courses for residents in ophthalmology, nurses, refraction, primary eye care	Limited training courses in low vision Lack of experts	Conduct training in screening, ophthalmology, education	Set up national training centre in each region		
	Technology: <i>LVDI procurement opportunities and production capacity</i>	National support available to all disabled persons	All LVDs are imported	Develop low-cost LVD production unit	Train opticians/optical technicians and equip optical workshop		

Country	Strategic programming component	Strengths	Constraints and weaknesses in existing programmes	Key objectives (what is wanted)	Strategies (how it will be done and by whom)	Regional support required	Timing framework 2002-2006
WPR Australia	Service delivery	Tertiary centres Eye care services	Inadequate community-based care Inadequate utilization	Greater involvement of generic eye care services Increased utilization	Training of CBR workers Awareness of services Reduce barriers to uptake of services		Inclusion of basic training for new and existing workers Double utilization
	Human resource development: <i>Human resource needs, identification of appropriate teams</i> <i>Curriculum standardization</i> <i>Training opportunities available</i>	Existing ophthalmic personnel Accreditation of national programmes	Low vision not incorporated in undergraduate and postgraduate training for all eye care personnel Few ophthalmologists with expertise in low vision Cost is a limiting factor	Include low vision as part of professional qualifications Increase training opportunities Establish loan pool for LVDs	Undergraduate and continuing education in low vision care Fellowships Local and regional "warehouses" or depots for LVDs		Available low-cost LVDs Establishment of regional depots for LVDs
	Technology: <i>LVD procurement opportunities and production capacity</i>	Good range of LVDs available					

Country	Strategic programming component	Strengths	Constraints and weaknesses in existing programmes	Key objectives (what is wanted)	Strategies (how it will be done and by whom)	Regional support required	Timing framework 2002-2006
Cambodia	Service delivery	National Plan for Prevention of Blindness based on WHO system and VISION 2020 National Centre	Lack of eye care personnel Inadequate facilities and resources	Establish low vision services at the national level and in the 4 regions of the country	Establish low vision services at tertiary level including training of MLP	Technical assistance and support to set up low vision centres	Achieve projected need of MLP to meet VISION 2020 objectives
	Human resource development: <i>Human resource needs, identification of appropriate teams</i>	Ophthalmologists MLP Ophthalmic nurses Optometry technicians	Lack of MLP in the provinces Lack of awareness Lack of eye care personnel	Train MLP in low vision in each province One optometry technician in each province	Integrate the low vision programme in the national plan for VISION 2020	Consultancy to assess the low vision situation in the country	Train MLP in low vision to meet national needs by 2006
	<i>Curriculum standardization</i>		No special curriculum for low vision training	Standardize curriculum on low vision in training programmes for different cadres	Working group to review refractionist curriculum and add a low vision component	Interregional curriculum standardization workshop for MLP training	Develop MLP curriculum by 2002
	<i>Training opportunities available</i>	2 training programmes for MLP in the region	Current training capacity inadequate to meet national needs	Establish a regional training centre for low vision	Training of trainers in low vision	Consultancy for training of MLP initially	Train 7 MLP for central level and one MLP for each province in low vision by 2006
	Technology: <i>LVD procurement opportunities and production capacity</i>		Lack of facilities and capacity to produce LVDs	Develop optical workshop to produce low-cost LVDs	Train opticians/optical technicians and equip optical workshop Establish low vision centres at central and regional levels	Sponsorship for training and equipping of workshops	Set up optical workshops for central and regional levels by 2006

Country	Strategic programming component	Strengths	Constraints and weaknesses in existing programmes	Key objectives (what is wanted)	Strategies (how it will be done and by whom)	Regional support required	Timing framework 2002-2006
China	Service delivery	National Plan for Prevention of Blindness based on VISION 2020	Lack of awareness of professionals and public	Develop more low vision clinics in the cities	Pilot low vision services in 6 provinces		Complete piloting by 2005
	Human resource development: <i>Human resource needs, identification of appropriate teams</i>	Ophthalmologists MLP Special education teachers	Lack of low vision personnel	Have at least 5 key personnel in low vision in each province PEC workers and MLP to be trained for each district	Optometrists will be trained in 7 medical universities		2000 MLP to be trained by 2006 300 optometrists to be trained by 2006
	<i>Curriculum standardization</i>	Curriculum for MLP and medical university designed and standardized	Need to evaluate curriculum		A national workshop to be held by the Ministry of Health and China Disabled Persons' Federation	Interregional standardization of MLP curriculum	
	<i>Training opportunities available</i>	3 training courses for optometrists and 10 training programmes for MLP at national level	Current training capacity inadequate to meet national need	Increase training capacity to produce 60 optometrists and 400 MLP per year	Strengthen 7 centres to train optometrists 6 other provinces to establish MLP training programmes	Support required to strengthen faculty in existing programmes	400 MLP and 60 optometrists to be trained per year by 2006
	Technology: <i>LVD procurement opportunities and production capacity</i>	Indigenous expertise and capacity exist	Lack of affordable assessment materials	Local companies to produce high-quality LVDs	Research and development for affordable assessment materials		

Country	Strategic programming component	Strengths	Constraints and weaknesses in existing programmes	Key objectives (what is wanted)	Strategies (how it will be done and by whom)	Regional support required	Timing framework 2002-2006
Hong Kong	Service delivery	Existing manpower and resources adequate to meet the national needs	Improvement of low vision services limited due to limited funding	All low vision clients to be able to receive appropriate low vision services at an affordable cost	More advocacy required Promotion of integration with other rehabilitation services Publicity campaigns Dissemination of information/ mailing of referral forms to eye care professionals	Promotion of low vision services through more regional events that involve Hong Kong and China to arouse government and public attention	
	Human resource development: <i>Human resource needs, identification of appropriate teams</i>	Low vision teams that comprise medical and rehabilitation services	Funding	Continuing education for practitioners Revision of low vision curriculum Low vision residency	Cooperation between HKSB, Health Authority and HK Polytechnic University		3 continuing education courses for practitioners per year 2-3 low vision residents per year
	<i>Curriculum standardization</i>	4-year optometry training curriculum with clinical and low vision components, validated internationally	Contents need to be broadened	Revise curriculum and increase clinical training in low vision	More clinical hours at training institutions		Completed by 2003
	<i>Training opportunities available</i>	30 optometry residents per year 10 special teachers per year		Increase by 5 each year	In progress		5 additional human resources each year
	Technology: <i>LVD procurement opportunities and production capacity</i>	LVDs imported Poor patients can receive free LVDs Manufacturers can be sourced	High cost of LVDs and increased health care expenses Specifications required	Availability of an inventory of affordable LVDs Research and development	HKSB and Polytechnic University to undertake research and development		Production of LVDs

Country	Strategic programming component	Strengths	Constraints and weaknesses in existing programmes	Key objectives (what is wanted)	Strategies (how it will be done and by whom)	Regional support required	Timing framework 2002-2006
Japan	Service delivery	Established health screening system	Inadequate follow-up Lack of awareness	Increase awareness on low vision in medical staff	Promotion of medical and rehabilitation field cooperation	Ministry of Health and Labour Regional education	Within 5 years
	Human resource development: <i>Human resource needs, identification of appropriate teams</i>	School doctors and nurses	Lack of knowledge of and techniques in low vision	Define the roles of different cadres in low vision Skills training in activities of daily living Appointment of key persons	Good communication between medical staff and volunteers in teams	Association of Ophthalmology Ministry of Education and Rehabilitation	Within 5 years
	<i>Curriculum standardization</i>	Law of school health	Lack of adequate planning	Establish a basic standard for low vision under school health	Understanding the use of LVDs	Association of Ophthalmology	Plan by 2003, start by 2006
	<i>Training opportunities available</i>	Orthoptic school School for ophthalmological rehabilitation centre	Lack of teachers and facilities	Addition of low vision to the curriculum Increasing teachers Training of trainers	Planning opportunities for professionals	Low vision-related organizations	Start by 2003
	<i>Technology: LVD procurement opportunities and production capacity</i>	LVDs easily accessible LVDs locally manufactured	High cost of LVDs and inadequate selection	Teamwork and networking with optical companies Public information	Use of mass media and Internet	Public Health Centre	By 2004

Country	Strategic programming component	Strengths	Constraints and weaknesses in existing programmes	Key objectives (what is wanted)	Strategies (how it will be done and by whom)	Regional support required	Timing framework 2002-2006
Korea (Republic of)	Service delivery	Coverage in children 40%, in adults 20%	Lack of awareness Communication barriers Inadequate referral	Increase awareness amongst the public and professionals	Establishment of low vision rehabilitation centres	Technical assistance and support from NGOs to establish low vision centres	Increase coverage to 80% in children and 70% in elderly by 2005
	Human resource development: <i>Human resource needs, identification of appropriate teams</i>	Teachers	Weak vocational training and CBR work	Enhance training support Increase trained personnel for low vision clinics	Cooperation for eye care with governmental and nongovernmental agencies	Technical cooperation and assistance for training of trainers	By 2003
	<i>Curriculum standardization</i>		No regular programme for low vision	Upgrade existing training curricula to incorporate low vision	Cooperation for eye care with governmental and nongovernmental agencies	Support to hold curriculum standardization workshops	2003
	<i>Training opportunities available</i>		Irregular and on a small scale	Increase in educational courses	Hold a national seminar/workshop	Support to hold a national seminar/workshop	2003
	<i>Technology: LVD procurement opportunities and production capacity</i>	All LVDs imported but production potential exists	Imported LVDs expensive	Develop production capacity for LVDs	Develop local industry for LVD production	Technical cooperation and assistance for developing local industry	2004

Country	Strategic programming component	Strengths	Constraints and weaknesses in existing programmes	Key objectives (what is wanted)	Strategies (how it will be done and by whom)	Regional support required	Timing framework 2002-2006
Lao PDR	Service delivery	Existing eye care services	Inadequate quality of services No low vision programmes	Set up a low vision service as part of eye care	School screening and teachers	Technical assistance and support to set up a low vision service	To start in 2 centres by 2002
	Human resource development: <i>Human resource needs, identification of appropriate teams</i> <i>Curriculum standardization</i>	Ophthalmologists Refractionists	Insufficient trained human resources	Train more human resources in low vision	Training of trainers Setting up training programmes	Technical assistance and support to run training programmes	To cover 50% of training needs by 2005
	<i>Training opportunities available</i>	Available for existing cadres	No low vision component in training	Introduction of low vision component in medical and education training programmes Development of materials in local language Development of a standard kit Training of trainers	Planning and annual meetings with key staff Low vision to be part of eye care in Lao pilot programmes	Policy-makers Curriculum development Advocacy for local government support in pilot area	Develop a curriculum on low vision for existing cadres by 2002 2 pilot programmes by 2002
	Technology: <i>LVD procurement opportunities and production capacity</i>	Availability of cheap low vision kits of low power	Lack of master trainer Geographical terrain Imported and high-power LVDs expensive and availability very limited	Availability of a basic range of good and simple LVDs	Testing LVDs in pilot areas Market research Setting up a local production unit	Low-cost imports Technical assistance to set up optical unit to produce LVDs	Low-cost imports by 2002

Country	Strategic programming component	Strengths	Constraints and weaknesses in existing programmes	Key objectives (what is wanted)	Strategies (how it will be done and by whom)	Regional support required	Timing framework 2002-2006
Malaysia	Service delivery	Good infrastructure, health care network referral system and working relationship Some basic low vision services exist Development of modified national PBL programme started	Insufficient awareness Inadequate and uneven coverage Inadequate screening in schools, preschool children not tested Inadequate human resources	Create awareness and need Collaborate closely with MoH to modify and adopt national plan Expedite MoH programme to develop low vision services in all government eye departments Capacity-building of human resources needed	Target areas of greatest need for NGO public awareness campaigns NCBM-CPB to work with MoH Standing Committee for Prevention and Control of Blindness With MoH, identify personnel for training	Policy guidelines INGDO (co-)funding for selected target areas as pilot projects of HRD and service delivery Low vision kits	National low vision plan – 2002 Awareness campaigns – 2002-2003 Low vision services in one-third of government eye departments by 2004, two-thirds by 2006
	Human resource development: <i>Human resource needs, identification of appropriate teams</i>	Ophthalmologists and optometrists MLP, preschool and SPED/regular schoolteachers Volunteers	Inadequate trained low vision personnel at all levels Very limited facilities for HRD at present	Train ophthalmologists, optometrists, MLP and (pre-)schoolteachers in low vision services: Government-NGO action	Train trainers Use existing low vision service centres/facilities initially Ensure inclusion of low vision in professional curricula	Support in training trainers and other key personnel	2003-2006: training/year for 3 ophthalmologists, 6 optometrists, 12 MLP and 30 teachers
	<i>Curriculum standardization</i>	Some very basic curricula exist, e.g. for optometrists and SPED teachers	No standardized, proper curricula developed and adopted as yet	Develop and adopt suitable curricula	NCBM-CPB and/or MoH: workshops to develop respective curricula for adoption	Technical and/or financial support for strategies	By late 2002/early 2003
	<i>Training opportunities available</i>	Very minimal and in only one or 2 places	Nothing available now outside of Federal Territory and Selangor	Set up decentralized, in-country regional training programmes	Train trainers	Sponsorship of key personnel and/or technical support	2003-2006
	<i>Technology: LVD procurement opportunities and production capacity</i>	Very limited stock of LVDs available MoH is equipping 2 eye departments per year with low vision services and a few LVDs	All LVDs are from overseas, and local production has not been considered	Explore viability of local production of LVDs, either centrally or by region Pursue centralized bulk buying from Asia Pacific producer(s) to cut costs	Identify “sympathetic” entrepreneur(s) to do a feasibility study If viable, identify MLP for training Identify a “procurement” organization, if necessary	Sponsorship for training in and equipping of LVD production workshop(s), if viable	Subject to research findings, develop 3 regional production workshops from 2003-2005

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New Zealand	Service delivery	Existing eye care services Private and charity services	Inadequate funding Lack of awareness High cost of services	Improved access Increased awareness Increased funding to programmes	Pilot low vision services in 3 sites as an operational research model (cost-benefit)	Support required to publish research results and to hold a national planning meeting	2002
	Human resource development: <i>Human resource needs, identification of appropriate teams</i>	Ophthalmologists Rehabilitation instructors Teachers	Team approach not nationwide No recognition of qualifications Limited resources	Develop teams for low vision Low vision training for ophthalmologists Integrated model	Recognition of training Career structure Awareness programmes		
	<i>Curriculum standardization</i>		No curriculum standardization	Develop and implement curriculum standardization for low vision training of different cadres	Adopt standard curriculum for training of ophthalmologists and MLP	Technical support for curriculum development	2002-2006
	<i>Training opportunities available</i>	Low vision introduced in optometrist training programme	No formal training Some distance learning	Continuing medical education Incentives for training	Low vision to be part of basic or post-basic training of different cadres	Support for approved and recognized training programmes for ophthalmologists and optometrists	2003
	Technology: <i>LVD procurement opportunities and production capacity</i>	Availability of imported LVDs	Imported and high-power LVDs expensive and availability limited	Availability of and accessibility to a basic range of good and simple LVDs	Network with other providers and purchasers of equipment		

Country	Strategic programming component	Strengths	Constraints and weaknesses in existing programmes	Key objectives (what is wanted)	Strategies (how it will be done and by whom)	Regional support required	Timing framework 2002-2006
Papua New Guinea	Service delivery	Basic structure established	Lack of awareness Poor accessibility to services	Set up a low vision service as part of eye care	Start service at a major eye clinic	Technical assistance and support to set up a low vision service	To start in 2002
	Human resource development: <i>Human resource needs, identification of appropriate teams</i> <i>Curriculum standardization</i>	Ophthalmologists Optometrists CBR workers	Insufficient knowledge and skills in low vision No low vision component in training	Train existing human resources in low vision	Detailed training for low vision service providers	Consultancy to set up a training programme Technical support required to develop a standard curriculum for training different cadres	2002
	<i>Training opportunities available</i>	Available for existing cadres	Lack of trainer in low vision	Training of trainers	Low vision to be incorporated in existing training programmes	Technical assistance of low vision consultant	2002
	<i>Technology: LVD procurement opportunities and production capacity</i>	Optical workshop established	Not yet producing low-cost LVDs	Produce low-cost LVDs	Existing optical technicians		2002

Country	Strategic programming component	Strengths	Constraints and weaknesses in existing programmes	Key objectives (what is wanted)	Strategies (how it will be done and by whom)	Regional support required	Timing framework 2002-2006
Philippines	Service delivery	Networking among NGOs	Lack of awareness Lack of logistic and government support	Promote awareness among professionals and the public	Dissemination of information (IEC) Website		2002-2003
	Human resource development: <i>Human resource needs, identification of appropriate teams</i>	Ophthalmologists Optometrists Special education teachers	Lack of awareness Need for MLP	Promote awareness of existing low vision services	Increase awareness in ophthalmologists and optometrists Training of MLP		2002
	<i>Curriculum standardization</i>		No low vision component in training of ophthalmologists	Standardize low vision in training of ophthalmologists and optometrists	Review curriculum of ophthalmologists and optometrists		2002-2004
	<i>Training opportunities available</i>	Available for existing cadres	Lack of formal training Training on demand and not regular	Training of existing human resources in low vision	Low vision to be part of formal curriculum Regular training		2002
	<i>Technology: LVD procurement opportunities and production capacity</i>	Available skilled optical technicians	LVDs not available	Availability of a basic range of good and simple LVDs	Do feasibility study for local production		2002-2003

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Singapore	Service delivery	Hospital-based low vision service Agency for visually handicapped	Many low vision persons not registered	Create easier entry and access to low vision service	Expand hospital-based low vision service		Ongoing
	Human resource development: <i>Human resource needs, identification of appropriate teams</i>	Ophthalmologists Optometrists	Lack of rehabilitation workers and social workers		Interest and train more rehabilitation and social workers		Ongoing
	<i>Curriculum standardization</i>	Standardized curriculum for medical and clinical fields	No standardized curriculum for rehabilitation workers and special teachers				
	<i>Training opportunities available</i>	Standardized training for medical and clinical fields	No standardized training for rehabilitation workers and special teachers		Invite trainers from other countries	Technical assistance from other countries	Ongoing
	<i>Technology: LVD procurement opportunities and production capacity</i>	Availability of LVDs at affordable price	All LVDs are imported				

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Viet Nam	Service delivery	Existing eye care services	No low vision programme	Set up a low vision service as part of eye care	Train key personnel in low vision	Technical assistance and support to set up a low vision service	To start 5 centres by 2002 and 10 by 2006
	Human resource development: <i>Human resource needs, identification of appropriate teams</i>	Special education teachers Vocational training instructors	Insufficient trained human resources	Train more ophthalmologists, nurses and optometrists in low vision	Establish a regional centre for training	Technical assistance and support to set up a regional training centre	5 persons trained in low vision for National Institute of Ophthalmology by 2002, 10 for other centres by 2006 20 optometrists to be trained by 2003
	Curriculum standardization	Training programme for MLP	No standardized curriculum for low vision in existing training programmes	Introduce low vision component in medical and educational training programmes	Develop and submit proposal to Ministry of Education	Regional curriculum development workshop to discuss training issues	Curriculum standardization of medical training programmes (medical school) by 2005
	Training opportunities available		Training has to be obtained from abroad	Train key persons	Train optometrists	Technical assistance to design curriculum	1 optometrist each for 20 centres by 2003
	Technology: <i>LVD procurement opportunities and production capacity</i>		Lack of low-cost LVDs No local production	Establish local production capacity	Set up an optical workshop to produce low-cost LVDs	Technical assistance and support to set up optical unit to produce LVDs	Affordable assessment materials available by 2006