VISION 2020
THE RIGHT TO SIGHT

Global Initiative for the elimination of avoidable blindness

Action plan 2006 – 2011

IAPB

VISION 2020 THE RIGHT TO SIGHT

World Health Organization

GLOBAL INITIATIVE FOR THE ELIMINATION OF AVOIDABLE BLINDNESS

ACTION PLAN 2006–2011

World Health Organization

WHO Library Cataloguing-in-Publication Data

Global Initiative for the Elimination of Avoidable Blindness : action plan 2006-2011.

1.Blindness – prevention and control. 2.Blindness – epidemiology. 3.Eye diseases – prevention and control. 4.Eye diseases – epidemiology. 5.Delivery of health care – organization and administration. 5.Health Planning. 6.World health. I.World Health Organization.

ISBN 978 92 4 159588 9 (NLM classification: WW 140)

Design: rsdesigns.com

Printed in France

CONTENTS

ACKNOWLEDGEMENTS

The Editorial committee consisted of Clare Gilbert, Peter Ackland, Serge Resnikoff, Suzanne Gilbert, Jill Keeffe, Catherine Cross, Ramachandra Pararajasegaram, Silvio Mariotti, Tony Ukety, Donatella Pascolini, Allen Foster, David Friedman, Hugh Taylor, Richard Le Mesurier, Christian Garms, Richard Porter, Nag Rao, Abi Smith and Louis Pizzarello. The cover photograph was taken by Jamshyd Masud, Sightsavers International.

The report was coordinated by Ivo Kocur. Its content and structure benefited significantly from comments and suggestions received from other rapporteurs, participants at the meeting and the WHO Secretariat. The report was edited by Anthony Waddell and Elisabeth Heseltine.

SUMMARY

The global initiative known as 'VISION 2020: the Right to Sight' is an established partnership between the World Health Organization (WHO) and the International Agency for the Prevention of Blindness (IAPB). It was launched in 1999 with the twin aims of eliminating avoidable blindness by the year 2020 and preventing the projected doubling of avoidable visual impairment between 1990 and 2020. The ultimate goal of the initiative is to integrate a sustainable, comprehensive, high-quality, equitable eye-care system into strengthened national health-care systems. In May 2006, the World Health Assembly adopted Resolution WHA 59.25, 'Prevention of avoidable blindness and visual impairment' (Annex II), which expanded on the base laid down in an earlier resolution (WHA 56.26; Annex I) and created a global mandate for VISION 2020.

To comply with Resolution WHA 56.26, WHO established a committee to monitor the elimination of avoidable blindness. The principal task of the committee is to monitor progress in implementing VISION 2020 and to assist in the preparation of periodic progress reports. The first meeting of the committee took place on 17–18 January 2006 (1).

The main working document of the VISION 2020 initiative has been The Global Initiative for Elimination of Avoidable Blindness (2), which outlines the strategic priorities and areas for activity that had been set before the launch of VISION 2020. More recent information, however, has shown a shift in the causes of preventable blindness and in the challenges faced (section 1). Additionally, the experience gained in the first phase of implementing VISION 2020 provided valuable insights into ways of strengthening programmes and activities, and it became clear that the action plan should be updated and refined if the ambitious aims of VISION 2020 were to be achieved on schedule.

To this end, a joint WHO–IAPB meeting of experts and representatives of partner organizations was convened (3) to review and update the original working document and to address emerging issues in the prevention of avoidable visual impairment. The resulting document highlights the main issues and developments and lays out a clear agenda for the next phase of implementation of VISION 2020. It is envisaged that this document will provide guidance for identifying the main global challenges for eye health, the opportunities for addressing them and the action to be taken by the international community in order to improve eye health globally.

As outlined in section 2, the three core approaches of VISION 2020 to the prevention of blindness and visual impairment (2) remain disease control, human resource development, and infrastructure and technology. Although these approaches are defined as three distinct components, their interdependence is obvious: disease control and elimination require an adequately trained, functional workforce with an enabling infrastructure and technology. The prevention of avoidable visual impairment will be achieved only if effective, efficient, comprehensive eye health-care services are integrated into well-managed, well-monitored national health systems. Significant advances have recently been made in human resource development and in strengthening infrastructure and technology in several regions of the world. These must now be scaled-up in terms of both numbers and, more importantly, coverage. Increasing recognition of the vital role of promoting and sustaining such approaches means that activities must now be undertaken and accelerated in three additional areas: advocacy and public relations; information, education and communication; and community participation.

Without global, regional and national action plans and leadership, the goal of eliminating avoidable blindness and low vision by 2020 is unlikely to be achieved. Section 3 presents ways in which the work of VISION 2020 would best be coordinated, implemented and sustained. Key themes are the importance of evidence-based approaches, the associated need for robust mechanisms of monitoring

and evaluation, and association of VISION 2020 with larger developmental initiatives, such as the Millenium Developmental Goals, in affecting areas such as poverty alleviation. Experience in implementing VISION 2020 indicates that its functioning should be reinforced at all levels, and support should be provided to its coordinators at regional and country level. The early years of VISION 2020 have shown us how to work together towards the common goal of eliminating avoidable blindness, which affects the quality of life of so many, with such devastating consequences for human, social and economic development.

To accelerate implementation of VISION 2020, countries in each WHO region were selected for intensified assistance (section 3.5), and the list of countries was submitted to the World Health Assembly in 2006. That approach does not, however, prevent other countries from implementing the strategies of VISION 2020.

This document gives eye health-care providers, policy-makers and VISION 2020 partners an action plan for the activities planned for 2006–2011, although many of the suggestions will be valid well beyond that period. The major base of VISION 2020 activities is at national level, where monitoring of eye-care services and VISION 2020 activities needs to be improved so that the impact of the interventions on reducing the prevalence of avoidable visual impairment can be assessed and evaluated periodically.

1. AVOIDABLE VISUAL IMPAIRMENT – A HUMAN, SOCIAL AND DEVELOPMENTAL ISSUE

In the 10th revision of the WHO International Statistical Classification of Diseases, Injuries and Causes of Death, 'low vision' is defined as visual acuity of less than 6/18 but equal to or better than 3/60, or a corresponding visual field loss to less than 20°, in the better eye with the best possible correction. 'Blindness' is defined as visual acuity of less than 3/60, or a corresponding visual field loss to less than 10°, in the better eye with the best possible correction. 'Visual impairment' includes both low vision and blindness (4).

1.1 CHANGING PATTERNS

Levels and causes of visual impairment at the time of the launch of VISION 2020

The first global estimate of the extent of visual impairment, in 1975, indicated that there were 28 million blind people. In the 1990s, it was estimated that the global population was likely to increase from 5.8 billion in 1996 to 7.9 billion by 2020, and most of the increase was expected to occur in the developing world. These population growth projections were used in turn to estimate the expected increase in the number of blind people. Estimates based on the 1990 world population indicated that there were 38 million blind people and almost 110 million with low vision (5). This estimate was later extrapolated, first to the 1996 world population (45 million blind and 135 million people with low vision) and then to the projected 2020 population (76 million blind). These estimates indicated that the global extent of visual impairment would double in the period 1990–2020, and this realization provided the impetus for the launch of VISION 2020 in 1999.

The estimated prevalence of blindness in 1990 ranged from 0.08% of children to 4.4% of persons aged over 60 years, with an overall global prevalence of 0.7%. It was also estimated that at least 7 million people become blind each year and that the number of blind people worldwide was increasing by 1–2 million per year.

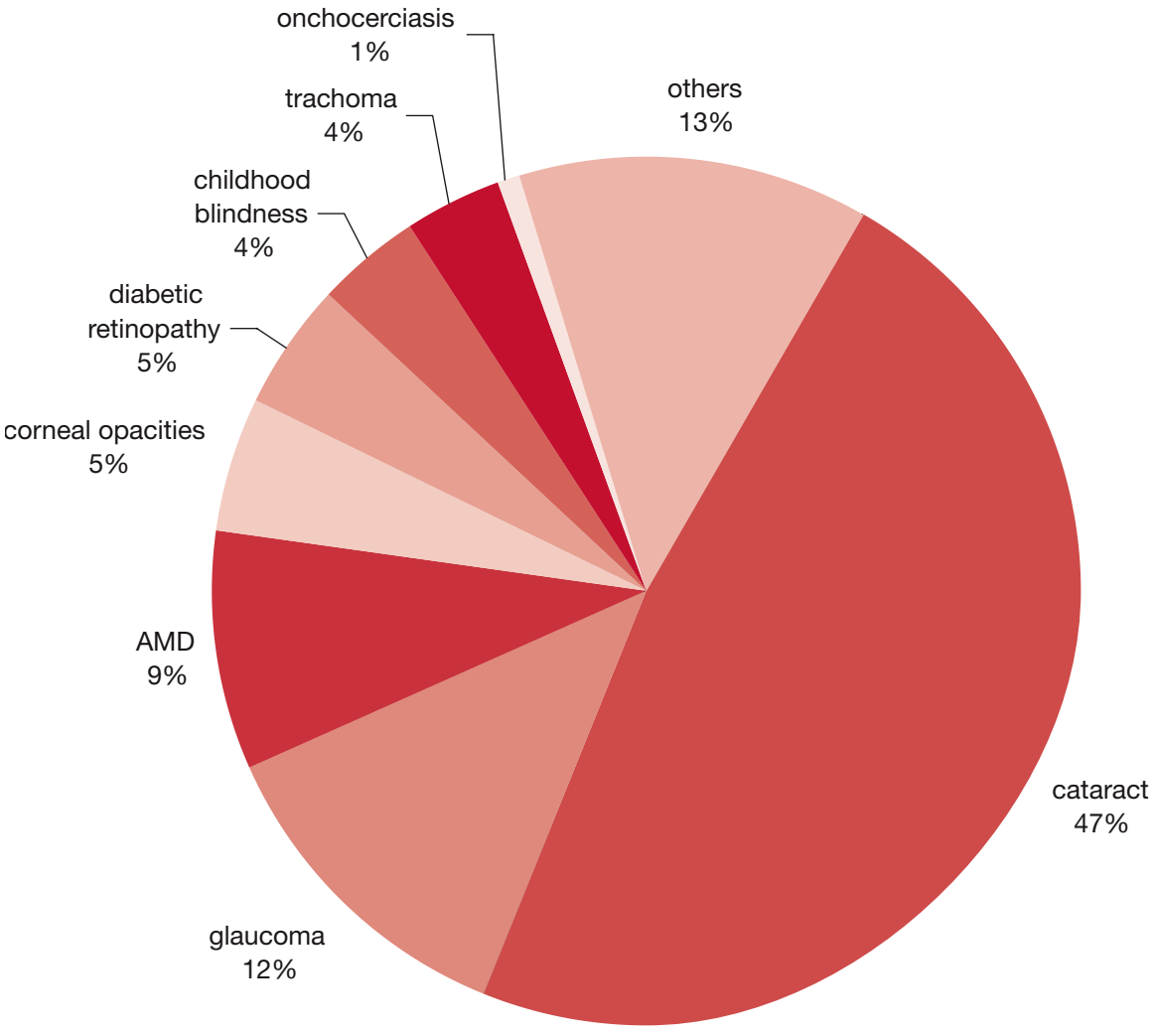
Of the estimated 45 million cases of blindness by 1996, approximately 60% were due to either cataract (16 million people) or refractive errors. A further 15% were due to trachoma, vitamin A deficiency or onchocerciasis, with another 15% due to diabetic retinopathy or glaucoma. The remaining 10% of cases were attributable to age-related macular degeneration and other diseases. In view of the proportion of treatable eye diseases or treatable causes of blindness, such as cataract, trachoma, onchocerciasis and some eye conditions in children, it was estimated that 75% of all blindness in the world could have been avoided.

Current extent and main causes of visual impairment

Since the 1990s, new data on visual impairment have been released by WHO (6). In 2002, more than 161 million people globally were visually impaired due to eye diseases (refractive error as a cause of visual impairment was not included in this statistic), 124 million of whom had low vision and 37 million were blind (Figure 1). Worldwide, for each person who becomes blind due to an eye disease, an average of 3.4 people have low vision, with country and regional variations ranging from 2.4 to 5.5.

In 2006, WHO released new global estimates (7), which, for the first time, included the global magnitude of visual impairment due to uncorrected refractive errors, accounting for an additional 153 million people. At least 13 million children (aged 5–15) and 45 million working-age adults (aged 16–49) were affected globally (Figure 2). Thus, according to WHO estimates, there are approximately 314 million people around the world whose vision is impaired, due either to eye diseases or uncorrected refractive errors. Of this number, 45 million people are blind (Figure 3). This statistic does not include uncorrected presbyopia, the prevalence of which is unknown.

Figure 1. Global causes of blindness due to eye diseases, excluding refractive errors



Major risk factors for visual impairment due to eye diseases

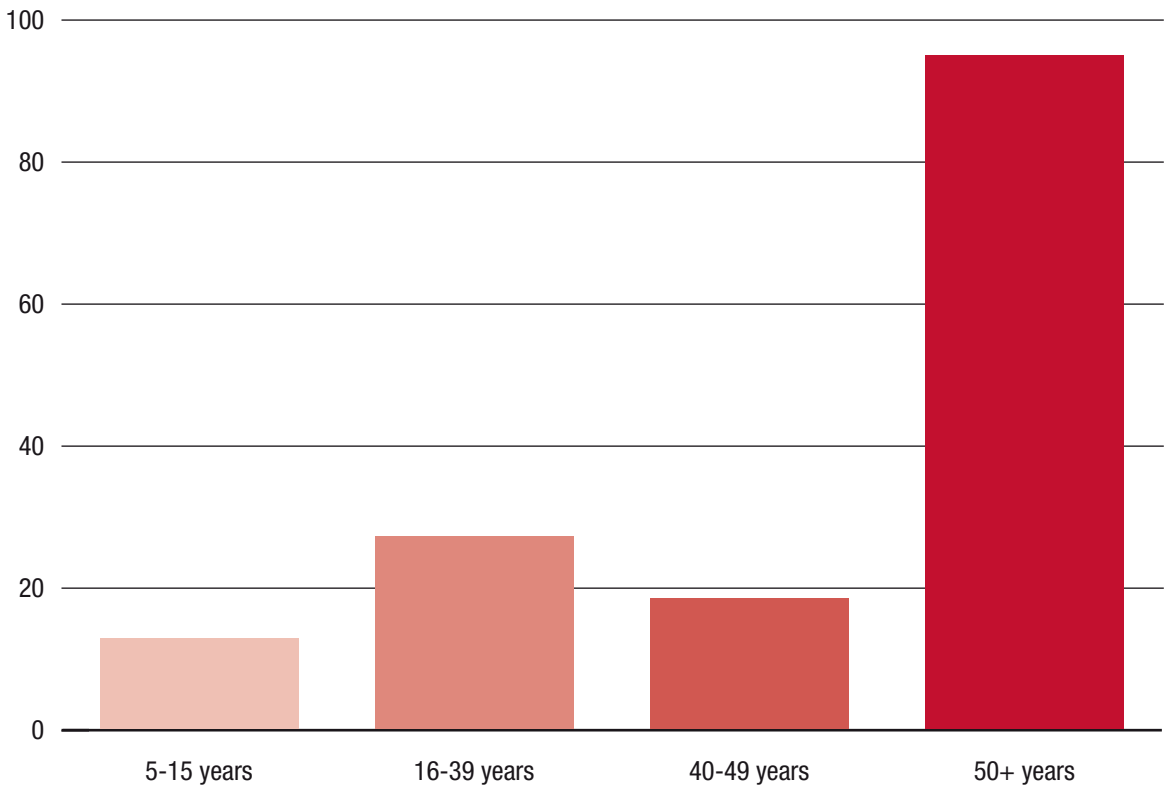
Age: Visual impairment is unequally distributed across age groups, as more than 82% of all blind people are 50 years of age or older, even though people in this age group represent only 19% of the world's population. Although the prevalence of blindness among children is about 10 times lower than that among adults, childhood blindness remains a high priority because of the expected number of years to be lived in blindness. About one-half of the estimated 1.4 million cases of blindness in children below the age of 15 could have been avoided.

Gender: Studies consistently indicate that females in every region of the world and of all ages have a significantly higher risk for being visually impaired than males, mostly because of their longer life expectancy and, in poorer societies, because of their lack of access to services.

Socioeconomics status: More than 90% of the world's visually impaired people live in developing countries.

Other risk factors include tobacco use, exposure to ultraviolet radiation, vitamin A deficiency, high body mass index and metabolic disorders.

Figure 2. Global extent of visual impairment due to uncorrected refractive errors (in millions)

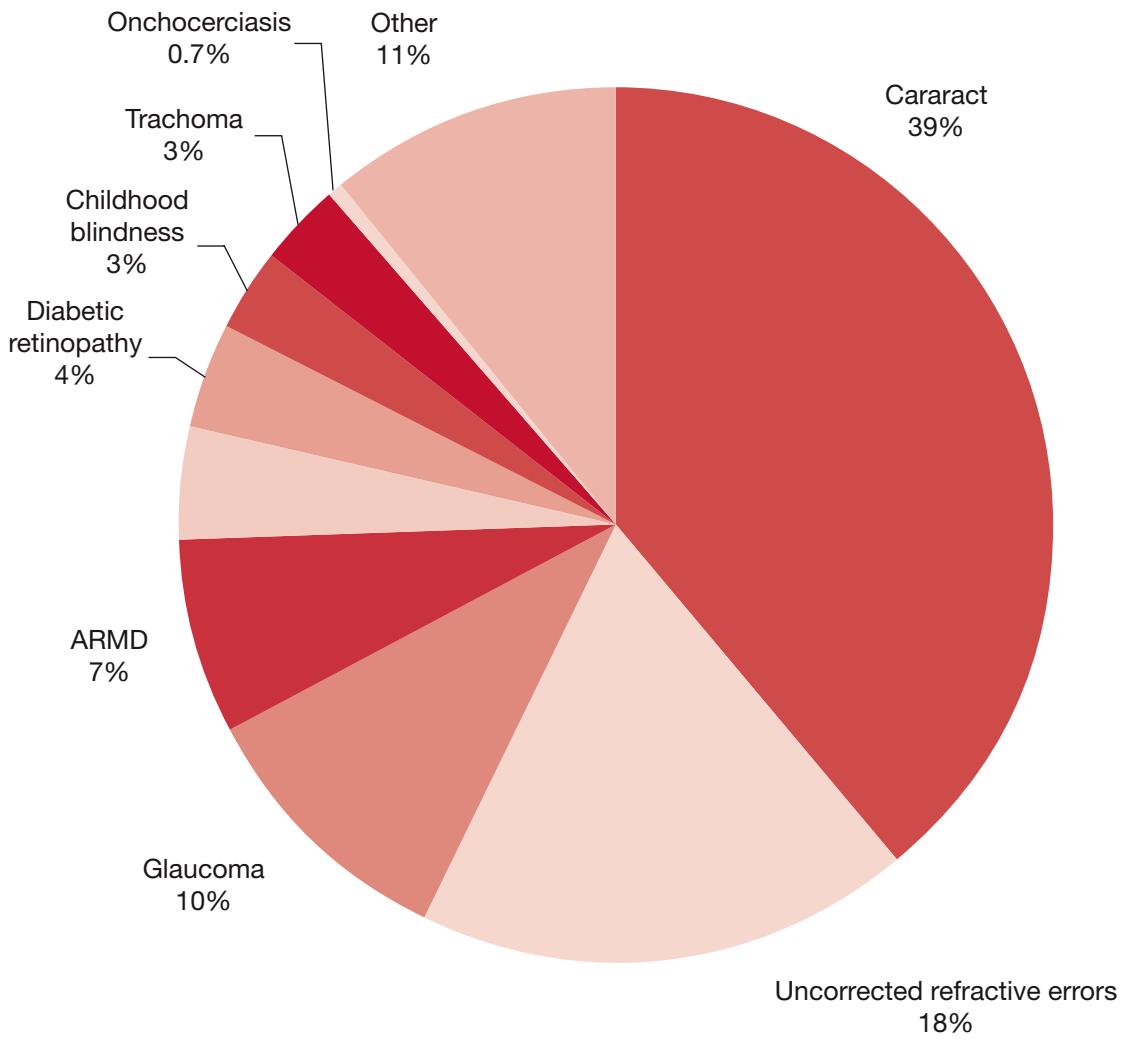


Projections of the extent and causes of visual impairment

WHO data on visual impairment due to eye diseases published in 2004 put the estimates into a new perspective. Additional epidemiological data from various countries indicated that the number of people who were blind due to eye diseases was lower than that projected on the basis of the 1990 population. Thus, in many countries, a considerable decline in the prevalence of blindness was documented, due to socioeconomic development and better provision of eye-care services.

Nevertheless, an increasing number of people will be at risk of visual impairment as populations grow and age. As the prevalence of diseases that affect the eyes (e.g. diabetes mellitus) also continues to increase, more and more people will have potentially blinding conditions, such as age-related macular degeneration, diabetic retinopathy and glaucoma. These are noncommunicable, chronic eye diseases to which the principles of long-term care (including cost of treatment, compliance and adherence) apply.

Figure 3. Global causes of blindness due to eye diseases and uncorrected refractive errors

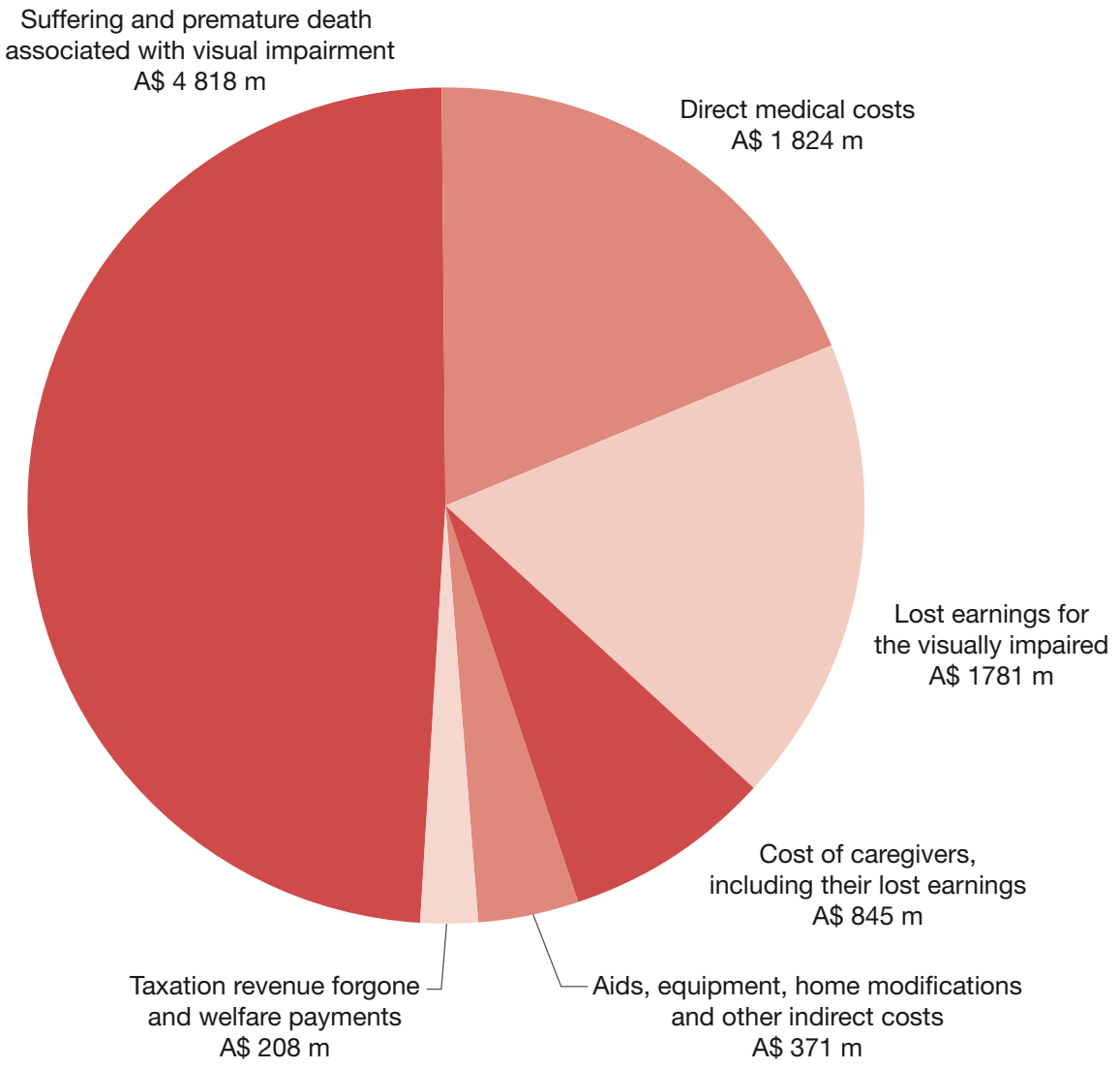


1.2 COSTS

Blindness has profound human and socioeconomic consequences in all societies. The costs of lost productivity and of rehabilitation and education of the blind constitute a significant economic burden for the individual, the family and society. The economic effects of visual impairment can be divided into direct and indirect costs. The direct costs are those of the treatment of eye diseases, including the relevant proportions of costs for running medical and allied health services, pharmaceuticals, research and administration. The indirect costs include lost earnings of visually impaired people and their caregivers and costs for visual aids, equipment, home modifications, rehabilitation, welfare payments, lost taxation revenue and the pain, suffering and premature death that can result from visual impairment.

The most comprehensive national assessment of the economic cost of visual impairment was conducted in Australia (8), where five principal eye conditions—cataract, age-related macular degeneration, glaucoma, diabetic retinopathy and refractive error—account for about 75% of all visual impairment. The analysis predicted that the direct cost of treating eye disease in Australia in 2004 would be A$ 1.8

Figure 4. Estimated total costs of eye disease in Australia, 2004



billion (US$ 1.3 billion), which was more than the cost of managing coronary heart disease, stroke, arthritis or depression nationally in that year and more than would be spent on diabetes mellitus and asthma combined (two priorities of the Australian National Health). Indirect costs were calculated to add another A$ 8.0 billion (US$ 5.6 billion) to the annual national eye-care bill for 2004 (Figure 4).

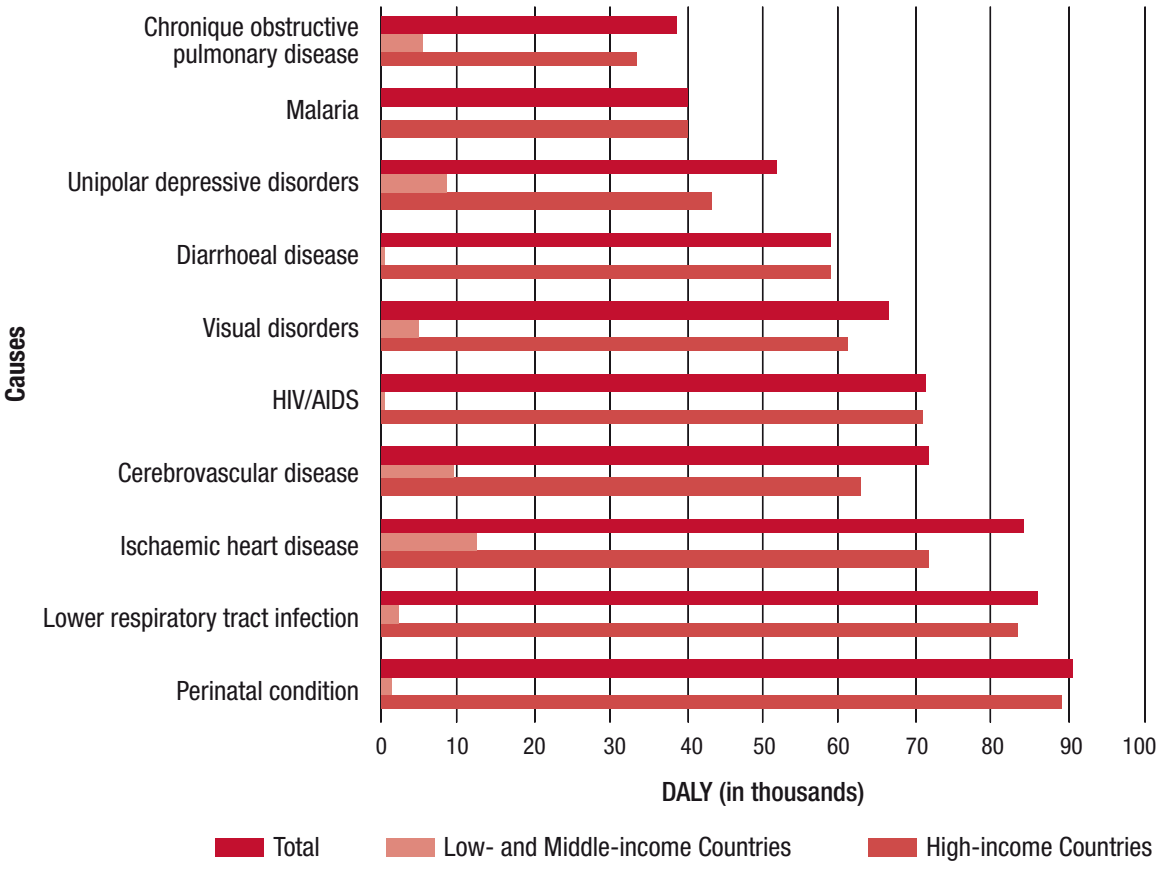
Poverty underlies not only the causes but also the perpetuation of ill health, including eye health, and thus the health status of a population and its socioeconomic conditions are correlated. Poverty additionally imposes barriers to access to health care.

In its 1993 World Development Report (9), the World Bank introduced the concept of 'disability-adjusted life years' (DALYs). This composite measure of the time lived with a disability and of the time lost due to premature mortality allows comparative assessments of health-care interventions in terms of cost per DALY saved. The measure is used increasingly for comparing costs and utility. Figure 5 shows DALYs according to the burden of various diseases (10).

1.3 PROJECTED ECONOMIC BENEFITS OF ADDRESSING THE ISSUE

WHO has estimated that up to three-quarters of all blindness worldwide is avoidable. In children, about one-half of the causes can be prevented or treated. The patterns of the causes of blindness in adults and children vary considerably from region to region, however.

Figure 5. Disability-adjusted life years (DALYs) according to the burden of various diseases



Cataract is by far the main cause of readily curable blindness. As there are no known effective means of preventing the commonest forms of cataract, surgery should be provided to all those in need. Cataract surgery can be one of the most cost-effective of all health interventions, with a cost per DALY saved in the order of US$ 20–40. Good-quality, high-volume cataract surgery can be provided at less than US$ 10 per DALY in some settings. Cataract interventions are thus as cost-effective as immunization and can significantly and rapidly reduce avoidable blindness.

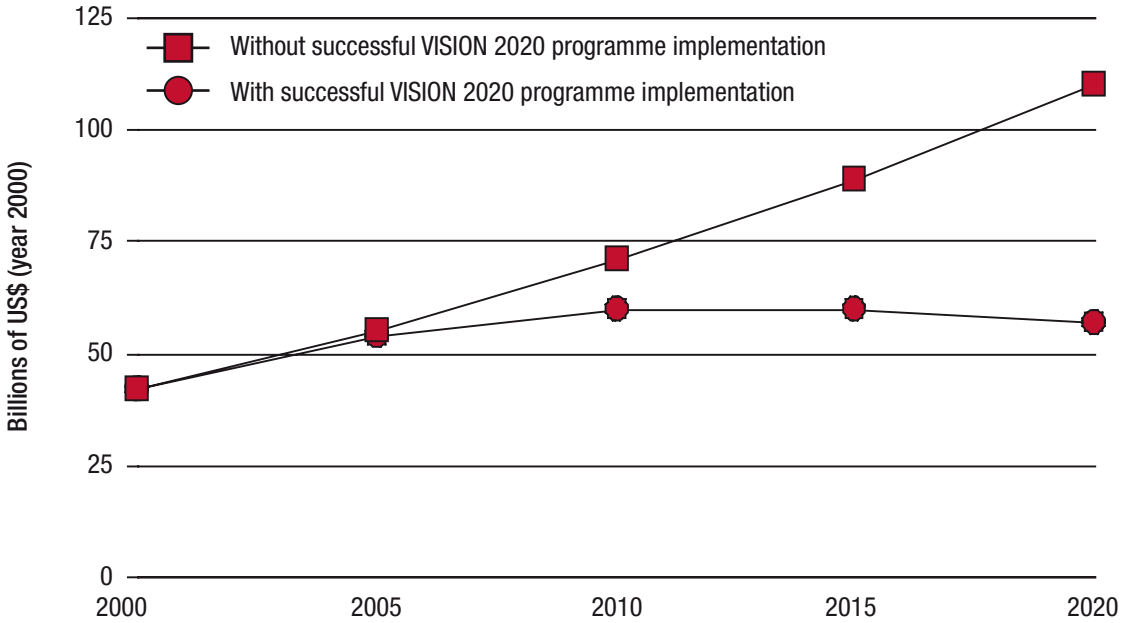
Onchocerciasis has been brought under control in many parts of West Africa through the WHO Onchocerciasis Control Programme, and the disease has been eliminated as a public health problem in 11 countries, equating to more than 600 000 cases of blindness prevented, 5 million years of productive labour added and 25 million hectares of land freed for use. The economic return rate, a measure of the total economic benefit of a programme in comparison with its total cost, has been estimated to be a highly satisfactory 20%. The economic return rate of the current African Programme for Onchocerciasis Control, which covers the remaining 19 endemic countries, is projected to be 18%.

Trachoma requires a range of medical, behavioural and environmental interventions. Data from some endemic countries show that both non-surgical (education and antibiotics) and surgical interventions (lid surgery for trichiasis) are among the most cost-effective measures for controlling blindness.

In the field of childhood blindness, control of xerophthalmia has also been shown to be cost-effective. Mass distribution of vitamin A capsules twice a year is one of the best health interventions available, with a cost per DALY saved of only US$ 9. The comparable cost for vitamin A fortification would be about US$ 29 per DALY saved.

Economic models at this level of detail are not yet available at a global level; however, according to a (conservative) analysis published in 2003 of the loss of productivity of individuals with visual impairment (11), the annual global economic impact of unaccommodated blindness and low vision in 2000 was US$ 42 billion. In the absence of a decrease in the prevalence of blindness and low vision, this figure was projected to rise to US$ 110 billion per year by the year 2020 (Figure 6). With successful implementation of VISION 2020, the annual loss of productivity of individuals with visual impairment

Figure 6. Projected worldwide cost of reduced productivity due to visual impairment caused by eye diseases, 2000–2020 (estimated in the 1990s)



was projected to rise to only US$ 58 billion in 2020, equivalent to an overall global saving over 20 years of US$ 223 billion.

Socioeconomic studies have shown that the prevention and treatment of avoidable blindness promote and accelerate progress towards a broader global development agenda, such as the Millennium Development Goals (Annex III). The direct links between the activities of VISION 2020 and human social and economic development must be strongly expressed and disseminated to decision-makers at all levels.

1.4 ACHIEVEMENTS AND CHALLENGES

Since its launch, more than 100 Member States have been directly involved in the activities of VISION 2020. The participation of local eye health-care experts and planners in VISION 2020 workshops has increased awareness about public health concepts in eye care, and Member States have been encouraged to constitute national VISION 2020 committees in order to assess local needs, develop national action plans and facilitate their implementation, monitoring and periodic assessment (Annex IV). It is important that societies be made aware of known, well-tested, cost-effective interventions for preventing avoidable visual loss. Partner organizations of VISION 2020 have been active in encouraging the integration of comprehensive eye-care services into national health-care systems, by:

- increasing political commitment to the prevention of visual impairment;
- increasing professional commitment to the prevention of visual impairment;
- increasing the provision of high-quality, sustainable eye care;
- increasing public awareness and use of eye health-care services; and
- encouraging the commitment and support of nongovernmental organizations and the private sector.

Impressive successes in the prevention of blindness (for example in Gambia, India, Morocco, Nepal, Philippines, Sri Lanka and Thailand) testify to the commitment of local VISION 2020 partners and demonstrate the impact and potential of this global initiative.

The initiative does not, however, operate in a static environment. As the world's population continues to change, so do the extent, causes and distribution of blindness and visual impairment. As more, better data become available from population-based studies, more accurate estimates can be made of the extent of the problem and the patterns of causes in different countries and regions, adding to the agenda of VISION 2020. As the prevalence of noncommunicable chronic eye diseases continues to grow substantially, global disparities in the availability of eye health-care services will continue to obstruct the prevention and control of avoidable blindness and low vision in the most populated, poorest parts of the world. To these challenges must be added the entrenched disparities in the allocation and availability of human and financial resources. Without the resources needed to implement national VISION 2020 plans for the prevention of blindness, there is a real danger that the momentum that has been built to eliminate avoidable blindness will be lost, which would impede opportunities to scale-up comprehensive, sustainable eye-care services as part of strengthened health systems. Provision of services for underserved groups such as the poor, ethnic minorities and women is linked to the development, adoption and implementation of adequate health-care policies.

These are only some of the issues facing the VISION 2020 initiative. Despite recent achievements in the prevention and control of avoidable blindness and low vision, considerable challenges remain that will require sustained, imaginative, concerted action. The achievements and limitations to date and strategies and recommendations for further implementation are described in detail in the following sections.

2. APPROACHES TO PREVENTION OF VISUAL IMPAIRMENT

2.1 INTRODUCTION

Eye-care services must be comprehensive, encompassing eye-health promotion, prevention, treatment and rehabilitation. The full range of these services must be integrated into health-care systems and delivered to the population in a stepwise manner. In order for VISION 2020 to meet its goals, services should reach the underserved sectors that exist in all populations, such as ethnic minorities, women, disabled persons and very old people. WHO, ILO and UNESCO are preparing new guidelines for community-based rehabilitation that address the rights and needs of people with disabilities, including those who are irreversibly blind. Efforts must be made to strengthen and promote advocacy about VISION 2020 among decision-makers, to design information, education and communication materials and campaigns and to expand community participation. If uptake is to be increased, awareness about eye diseases and their prevention and treatment must be stimulated by locally appropriate information and dissemination strategies. Inciting the community to take responsibility for its own eye health is one way of ensuring effective, sustainable services.

This section presents an updated approach for implementing the established activity areas, or 'pillars', of VISION 2020, which are disease control, human resource development, and infrastructure and technology.

2.2 DISEASE CONTROL AND PREVENTION OF VISUAL IMPAIRMENT

Cataract

Globally, cataract (opacification of the lens) is the single most important cause of blindness, and cataract surgery has been shown to be one of the most cost-effective health-care interventions. Most cataract is related to ageing and cannot be prevented, but cataract surgery and insertion of an intraocular lens are highly effective, resulting in almost immediate visual rehabilitation. In well-managed eye units, high-quality, high-volume surgery is possible, one ophthalmologist being able to undertake 1000–2000 or more operations a year, as long as there are adequate support staff, infrastructure and patients who are able and willing to access the facilities.

Table 1. Estimates of numbers and proportions of persons in various WHO regions who are blind due to cataract

Region[a]	No. of countries	No. of persons blind due to eye diseases (x 1000)	Persons blind due to cataract	
			No. (x 1000)	%
African D	26	3 646	1 823	50.0
African E	20	3 642	2 003	55.0
Americas A	3	694	35	5.0
Americas B	26	1 392	557	40.0
Americas D	6	332	194	58.5
Eastern Mediterranean B	13	1 076	527	49.0
Eastern Mediterranean D	9	1 406	689	49.0
European A	26	937	47	5.0
European B1	16	618	176	28.5
European B2		142	50	35.5
European C	9	1 035	248	24.0
South-East Asia B	3	4 214	2 444	58.0
South-East Asia D	7	8 344	4 255	51.0
Western Pacific A	5	393	20	5.0
Western Pacific B1	22	7 731	3 750	48.5
Western Pacific B2		1 229	799	65.0
Western Pacific B3		25	16	65.0
Total	192	36 856	17 634	47.8

[a] Further information on classification of countries into subregions can be obtained from: Murray CJL et al. The Global Burden of Disease 2000 project: aims, methods and data sources. Geneva: World Health Organization, 2001 (Global Programme on Evidence for Health Policy Discussion Paper No. 36). Available from: http:/www.who.int/entity/en

Current situation

There are estimated to be almost 18 million people who are bilaterally blind from cataract, representing almost half of all causes of blindness due to eye diseases globally (Table 1). The proportion of blindness due to cataract among all eye diseases ranges from 5% in western Europe, North America and the more affluent countries in the Western Pacific Region to 50% or more in poorer regions. The main non-modifiable risk factor is ageing. Other frequently associated risk factors are injury, certain eye diseases (e.g. uveitis), diabetes, ultraviolet irradiation and smoking. Cataract in children is due mainly to genetic disorders. Visually disabling cataract occurs far more frequently in developing countries than in industrialized countries, and women are at greater risk than men and are less likely to have access to services.

The cataract surgical rate—the number of cataract operations per million population per year—is a quantifiable measure of the delivery of cataract surgical services (Annex V). It is meaningful, however, only when it includes all cataract operations performed in a country, including those in the private sector and during outreach, and when the population size and age structure can be defined. Cataract surgical coverage indicates the number of individuals with bilateral cataract causing visual impairment, who have received cataract surgery on one or both eyes, in other words, the proportion who were eligible for surgery and who received it. This indicator is used to assess the degree to which cataract surgical services meet the need. The data are obtained from population-based surveys or rapid assessments (Table 2). Software for monitoring and assessing the quality of cataract surgery are available, and VISION 2020 encourages the monitoring of quality so that performance continues to improve. The cataract surgical rate by WHO region in 2006 is shown in Figure 7.

There are two main surgical techniques for removing a cataract: extracapsular cataract extraction and phacoemulsification. In extracapsular cataract extraction, the lens capsule is opened and the nucleus of the lens and the cortex are removed, leaving the posterior capsule in place. This can be done through a small incision, which does not usually require sutures, or through a standard incision

Figure 7. Cataract surgical rate by WHO region in 2006

closed by removable sutures. In phacoemulsification, an ultrasound probe is used to fragment the lens, which is aspirated through a small incision.

There are three ways of correcting aphakia, an eye with a surgically removed lens: spectacles, contact lenses or an intraocular lens. Thick spectacles are required for patients who have undergone intracapsular extraction, and this technique was widespread in the past. Contact lenses are not appropriate in most settings. An intraocular lens, implanted after the cataract has been removed, is the optimal method, as it eliminates the use of thick spectacles. Nevertheless, light spectacles are often necessary to compensate the loss of accommodation.

Achievements

Cataract is included in most national plans for the prevention of blindness, and cataract surgical rates are increasing in many countries. Cost-effective surgical techniques have been developed and tested and are being improved continuously (e.g. small-incision cataract surgery and use of good-quality, low-cost intraocular lenses) (22).

Table 2. Cataract surgical coverage and cataract surgery outcome in selected countries

Country (reference)	District	Year of study	Persons with visual acuity < 3/60 due to cataract who received cataract surgery (%)		Eyes with post-operative visual acuity ≥ 6/18 (%)	
			Male	Female	With pinhole	With available correction
China[12]	Shunyi County	1996	54.3	44.9	36.2	25
China[13]	Doumen County	1997	49.1	36.9	3	24
India[14]	Rajasthan, rural	1998	67.8	64.2	61.5	31.5
India[15]	Sivaganga District	1999	80.9	75.2	82.6	50.5
Pakistan[16]	Chakwal District	1999	92.8	73.9	64	51.1
India[17]	Tirunelveli District	2000	69	49.4	83	52.7
Turkmenistan[18]	Whole country	2000	61.4	52.8	Not available	30.6
Armenia[19]	Gegharkunik marz	2003	76.9	44.4	Not available	57.1
Guatemala[20]	Four departments in south-west	2004	49	28	55.7	40.5
Bangladesh[21]	Satkhira District	2005	63.6	59	67.6	60.1

Limitations

The main limitations are lack of resources and political will to address cataract blindness as a global public health issue. In many poor rural districts, there is a dramatic lack of eye-care services, and, even where they are available, their quality is not always satisfactory (11).

High-quality low-cost cataract service models are widely used in a number of countries, but their uptake in low-income countries is slow, due to local conditions such as the influence of the private sector and the presence of more expensive products on the market. The main barriers to uptake of cataract surgery in poor communities are lack of awareness, poor quality of service, high cost of treatment and limited access.

Aim

- to eliminate blindness due to cataract

Objective

- to provide cataract surgical services at a rate adequate to eliminate the backlog of cataract over a number of years, at a price that is affordable for all people, both rural and urban, in an equitable manner, and with a high success rate in terms of visual outcome and improved quality of life

Strategies

- Create demand for services by overcoming barriers to the uptake of cataract surgical services. The approaches recommended include enlisting community health and rehabilitation workers to identify people with cataract and to provide follow-up and rehabilitation after surgery. Priority should be given to patients who are bilaterally blind from cataract; however, patients should be encouraged to seek treatment before becoming blind, thereby reducing their dependence on the family and society, and this should be taken into consideration in calculating the desired cataract surgical rate.
- Develop and mobilize local manpower and resources to provide cataract services. Training and use of mid-level personnel will allow ophthalmologists more time for surgery. Private ophthalmologists should be actively involved.
- Promote services at a cost that all patients can afford. This might require bulk purchase of consumables and tiers of payment, whereby fees from high-income patients are used to subsidize services for low-income patients. Introduce cost-effective methods and techniques for cataract surgery.
- Promote services that are close to where people live. Outreach to remote areas should be conducted where appropriate. Screening for new cases is acceptable only when surgical services are in place so that newly identified patients can be treated. Short-term or one-time surgical camps are not appropriate, except under specific circumstances.
- Promote high-quality surgery with a good visual outcome. Intraocular lenses should be used for all patients, unless contraindicated. Monitoring of the outcome of surgery should be encouraged to improve quality. Provide facilities and promote practices and behaviour that are acceptable to patients.
- Ensure complementarity with governmental and nongovernmental service delivery.

Targets

- Cataract surgical rate: Each county's national plan for the prevention of blindness should include achievable targets for increasing the cataract surgical rate to the desired level, which should be the rate required to eliminate cataract-related, severe visual impairment calculated on the basis of data for the local population. The rate will depend on the prevalence of cataract causing visual impairment, the visual acuity recommended for eligibility for surgery and demographic trends.
- Cataract surgical coverage: Ultimately, the highest possible cataract surgical coverage (at least 85%) should be reached. Monitoring cataract prevalence at district and subnational level and using cost-effective methods for assessing cataract surgical coverage will allow identification of gaps, so that services are targeted to areas and subgroups at greatest need.
- Quality of cataract services: WHO targets for the quality of cataract surgery will be met, i.e. at least 85% of eyes achieve 6/18 or better presenting visual acuity postoperatively (22).

Indicators

- national (regional or global) prevalence of blindness due to cataract, obtained from population-based epidemiological studies or rapid assessment;
- national, district or subnational cataract output (number of cataract operations per year) and cataract surgical rates (number of cataract operations per million population per year);
- cataract surgical coverage (proportion of need that is being met, for example, the proportion of aphakia or pseudophakia in relation to blindness due to cataract in representative samples of the population);
- proportion of cataract surgery with intraocular lenses (intraocular lens implantation rate); and
- quality of cataract surgery in representative samples of the population, evaluated, for instance, in rapid assessments of cataract surgical services.

Refractive errors

Refractive errors (myopia, hypermetropia, astigmatism, presbyopia) result in an unfocussed image falling on the retina. Uncorrected refractive errors, which affect persons of all ages and ethnic groups, are the main cause of visual impairment. They may result in lost education and employment opportunities, lower productivity and impaired quality of life. Services should focus on children, the poor and adults over the age of 50 years, and the correction provided must be affordable, of good quality and culturally acceptable. Services for refractive errors should be integrated at all levels of eye-care provision, including outreach. Assessment of individuals who have refractive errors, particularly those aged 50 years or above, provides an opportunity for identifying other potentially blinding conditions before they cause visual loss (such as glaucoma and diabetic retinopathy)

Current situation

There are estimated to be 153 million people with visual impairment due to uncorrected refractive errors, i.e. presenting visual acuity < 6/18 in the better eye, excluding presbyopia. Globally, uncorrected refractive errors are the main cause of visual impairment in children aged 5–15 years. The prevalence of myopia (short-sightedness) is increasing dramatically among children, particularly in urban areas of South-East Asia.

The most frequently used options for correcting refractive errors are: spectacles, the simplest, cheapest and most widely used method; contact lenses, which are not suitable for all patients or environments; and corneal refractive surgery, which entails reshaping the cornea by laser.

The steps in the provision of refraction services are:

- case detection: identification of individuals with poor vision that can be improved by correction;
- eye examination: to identify coexisting eye conditions needing care;
- refraction: evaluation of the patient to determine the correction required;
- dispensing: provision of the correction, ensuring a good fit of the correct prescription; and
- follow-up: ensuring compliance with prescription and good care of the correction, repair or replacement of spectacles if needed.

Achievements

The VISION 2020 global initiative intensively promotes awareness of the extent of uncorrected refractive errors and the means for correcting them. Uncorrected refractive errors are increasingly being addressed in national plans for the prevention of blindness, and low-cost, good-quality spectacles are becoming available. In 2003, a WHO working group reviewed the current classification of visual impairment and blindness and made recommendations for the revised version of the International Classification of Diseases (ICD) (23). It recommended that the definitions of ‘blindness’ and ‘low vision’ be amended and that the term ‘presenting visual acuity’ be substituted for ‘best-corrected visual acuity’, as the latter does not allow an estimate of the contribution of undercorrected refractive error to the visual impairment.

Limitations

- insufficient data on the prevalence and types of refractive errors in different populations and age groups;
- lack of qualitative research on the impact of refractive errors on quality of life, visual function and economic productivity;
- insufficient evidence about the most cost-effective ways of delivering refraction services in different settings; and
- underestimation by health-care providers and policy-makers of the extent and potential socioeconomic impact of uncorrected refractive errors in the community.

Aim

- to eliminate avoidable visual impairment due to uncorrected refractive errors and reduce the magnitude of uncorrected presbyopia

Objective

- to provide refraction and optical services that have a high success rate in terms of visual acuity and improved quality of life and are affordable, of good quality and culturally acceptable, to rural as well as urban populations

Strategies

- Establish comprehensive eye-care services, so that refraction services with provision of suitable correction tools are available at all levels, including during outreach activities.
- Train human resources to ensure that high-quality refraction and optical service are available where needed.
- Improve public awareness and generate demand for services through community-based initiatives, primary eye care and school eye-health programmes.
- Specifically in low-income settings, provide spectacles that are new, of good quality, accessible and affordable.
- Assess the prevalence of refractive errors where data are lacking, and explore the optimal means of delivering services that are acceptable and cost effective.

Targets

- Each national VISION 2020 plan shall incorporate measures to address visual impairment due to uncorrected refractive errors.
- Achieve a ratio of one trained functional refractionist per 100 000 population by 2010 and 1:50 000 by 2020.
- Comprehensive eye care services should ensure that refraction services with provision of suitable correction tools are available at all levels of service delivery, including during outreach.
- Particular attention should be paid to children of primary and secondary school age, the working poor and adults over the age of 50 years.
- The correction provided should be affordable, of good quality and culturally acceptable.
- Epidemiological research should be conducted on the prevalence of uncorrected refractive errors and its trends.

Indicator

proportion of people with uncorrected refractive errors that cause visual impairment (i.e. presenting with visual acuity < 6/18 in the better eye)

Low vision

Low-vision services are aimed at people who have residual vision that can be used and enhanced by specific aids. Low vision is currently defined as 'visual acuity of < 6/18 down to and including 3/60 in the better eye', from all causes. Many such persons require cataract extraction or refraction services. In 2009, the term 'low vision' will be deleted from the 10th revision of the ICD (ICD-10), leaving the terms 'moderate visual impairment (presenting visual acuity of < 6/18 to 6/60)' and 'severe visual impairment (< 6/60 to 3/60)', from all causes.

In 1993, at a meeting in Bangkok, Thailand, the following definition was agreed on to identify persons who could benefit from low-vision services (24): "A person with low vision is someone who, after medical, surgical and/or optical intervention, has a corrected visual acuity in the better eye of < 6/18 down to and including light perception or a central visual field of < 20 degrees, but who uses or has the potential to use vision for the planning and/or execution of a task." To prevent confusion in this document, when this second meaning of the term 'low vision' is intended it will be referred to as 'functional low vision' or it will be used in the context of low-vision services. The definition of 'functional low vision' can be used in population-based surveys to determine prevalence and causes, although some persons with a corrected visual acuity of 6/18 or above in the better eye might benefit from low-vision care.

Current situation

Currently, there are no global estimates of the number of people with functional low vision. It is likely, however, to be 40–65 million. The number of people with low vision will increase as a result of the ageing of the world's population, and age-related macular degeneration, glaucoma and diabetic retinopathy are increasingly important causes of low vision.

Low-vision services are not available in many countries, particularly developing countries, or are located only in major cities. It is estimated (25) that less than 5% of people needing low-vision care have access to it, but there is considerable variation between regions and countries.

Achievements

VISION 2020 intensively advocates for increased awareness of the need for low-vision services, and courses to train national focal persons in low-vision programme management have been conducted in four regions. These persons are then responsible for working with national VISION 2020 committees to ensure low-vision services. A low-vision resource centre is operating from Hong Kong, Special Administrative Region, China, to distribute high-quality, affordable low-vision devices and equipment to all regions. Low-vision services have been set up in some tertiary paediatric eye centres and often serve as national models; however, they can provide services only up to their capacity.

Limitations

- Provision of low-vision services is generally not favoured by eye-care providers because of the low economic gain.
- The need for low-vision services is often not fully recognized, owing to inadequate epidemiological data on the prevalence and causes of functional low vision. This information is needed for planning services.
- There is little evidence for the cost-effectiveness of low-vision care interventions.
- Persons with low vision are often unaware that they can be helped.
- Communication and referral between eye-care, special education, rehabilitation and low-vision services are often inadequate.
- In some national VISION 2020 plans, planning for low-vision services is inadequate.

Aim

- to enhance vision-related quality of life for people with functional low vision

Objectives

- to increase awareness about low-vision care among eye-care professionals and persons with functional low vision;
- to provide evidence on the prevalence and causes of functional low vision;
- to establish comprehensive low-vision care for children and adults; and
- to provide evidence for the impact of low-vision services on quality of life and barriers to access to low-vision services.

Strategies

- Advocate for the inclusion of low-vision care as part of eye-care, education and rehabilitation services, and for awareness about low vision and low-vision services in the community and among health, education and rehabilitation professionals.
- Include low vision in the curriculum of ophthalmologists and other eye-care personnel.
- Complete training of national focal persons, and mentor those who have been trained.
- Disseminate the existing curriculum and materials for training primary- and secondary-level personnel.
- Establish or promote low-vision services in tertiary- and secondary-level eye-care centres.
- Establish networks with other global campaigns, such as those of the International Council for Education of People with Visual Impairment and the World Blind Union.
- Summarize existing evidence and conduct research on the best practice for the provision of low-vision services, their impact on life and limitations to their provision and uptake.

- Document existing effective models of comprehensive low-vision care at primary, secondary and tertiary levels of eye care in both developed and developing countries.
- Arrange for transfer of knowledge to countries to encourage the establishment of new programmes.
- Establish regional low-vision resource centres, as required.
- Promote use of good-quality low-vision aids, such as those provided by the low-vision resource centre in Hong Kong.
- Promote the development of high-quality, low-cost low-vision devices to increase access.

Targets

- Each national VISION 2020 plan has incorporated low-vision services.
- In countries with no provision, establish at least one low-vision centre by 2011. For countries that already have low-vision services, expand the provision with a target of one tertiary low-vision service for every 10 million population, or at least one per country, by the year 2020.
- Examine all children in schools and in services for vision-impaired children for the need for low-vision devices, and assess whether referral will be required for rehabilitation or educational services.
- Have functioning low-vision clinics in all tertiary child eye-care centres with trained eye-care professionals.
- Complete national focal person training courses in all regions, with refresher training and mentoring.
- Equip tertiary, secondary and primary low-vision services according to the VISION 2020 standard list.
- Have at least two low-vision resource centres in operation by 2011.

Indicators

- number and percentage of low-vision services at tertiary level that have equipment that meets or exceeds the VISION 2020 standard list requirements;
- number of persons with functional low vision who have access to low-vision services; and
- number of countries with a trained national focal person.

Childhood blindness

As the causes of blindness in children differ from those in adults, different control measures are needed. In low-income countries, high proportions of children are blind from preventable causes, which require community-based interventions. In all regions, children with treatable diseases, principally cataract, can have their sight restored. Childrens' eyes cannot, however, be considered smaller versions of adults' eyes, and specific expertise and equipment are required. Unlike adults, children require long-term follow-up after surgery, to manage complications and to prevent amblyopia ('lazy eyes'). The understanding and involvement of parents is critical. In all regions, children with irreversible visual loss must be assessed for low-vision services, early visual stimulation, rehabilitation or special education, depending on their age and level of residual vision.

Current situation

It has been estimated that there are 1.4 million blind children in the world, 1 million of whom live in Asia and 300 000 in Africa (26). The prevalence ranges from 0.3/1000 children aged 0–15 years in affluent countries to 1.5/1000 children in very poor communities. Although the number of blind children is relatively low, they have a lifetime of blindness ahead, with an estimated 75 million blind-years (number blind × length of life), second only to cataract.

The same report showed that 500 000 children become blind each year (nearly one per minute). Many die in childhood from the underlying cause, such as measles, meningitis, rubella, prematurity, genetic diseases and head injuries. Most blind children are either born blind or become blind before their fifth birthday. Owing to demographic differences, the number of children who are blind per 10 million population varies from approximately 600 in affluent countries to approximately 6000 in very poor communities. About 40% of the causes of childhood blindness are preventable or treatable.

The causes of childhood blindness vary, but the main avoidable causes are:

- corneal scarring in Africa and poorer countries in Asia;
- cataract everywhere;
- glaucoma everywhere;
- retinopathy of prematurity in high- and middle-income countries and some cities in Asia;
- refractive errors everywhere, but particularly in South-East Asia; and
- low vision, which encompasses visual impairment and blindness from untreatable causes, in all regions.

The main causes of blindness in children change over time. As a consequence of child survival programmes (for example, integrated management of childhood illness), corneal scarring due to measles and vitamin A deficiency is declining in many developing countries, so that the proportion due to cataract is increasing. Retinopathy of prematurity is emerging as an important cause in the middle-income countries of Latin America and eastern Europe and is likely to become an important cause in Asia over the next decade. The prevalence of refractive errors, particularly myopia, is increasing in school-age children, especially in South-East Asia

Achievements

- Vitamin A deficiency: There are concerted global efforts to control vitamin A deficiency in children and women of child-bearing age. The United Nations Children's Fund (UNICEF) has estimated (27) that between 1998 and 2000 about 1 million child deaths were prevented by these global efforts, and the Vitamin A Global Initiative led by UNICEF has set the target of eliminating vitamin A deficiency by the year 2010.
- Measles: Measles immunization coverage continues to improve, resulting in a lower incidence of measles and measles-related deaths. In 2004, there were 454 000 deaths from measles, a reduction of 48% from 1999. The Measles Initiative (28), a partnership between the American Red Cross, the United States Centers for Disease Control and Prevention, the United Nations Foundation, UNICEF and WHO, is now focusing on 47 countries, mainly in sub-Saharan Africa where 98% of deaths occur, with the goal of reducing deaths from measles by 90% by 2010 from the estimates for 2000. The WHO Region of the Americas has eliminated measles, and three other regions have set elimination targets. Reducing the prevalence of measles will also reduce the number of children with measles-related corneal ulceration and scarring.
- Retinopathy of prematurity: Programmes for detecting and treating severe retinopathy in premature infants at risk are expanding throughout Latin America and eastern Europe and are being established in urban areas in China, India and other Asian countries.
- Child eye-care centres: Training in paediatric ophthalmology is becoming more prevalent, and tertiary level child eye-care centres are being set up in low-income countries.
- Consumables for children: Low-vision devices suitable for children as well as other consumables are available through resource centres in Hong Kong, China, and Durban, South Africa.

Limitations

- inadequate population-based data on the prevalence and causes of blindness in children;
- lack of awareness among parents and the community about preventive measures and that the vision of children who are blind can often be improved or maximized;
- barriers to accessing services, including lack of awareness, distance, cost, fear and competing demands for scarce resources within the family;
- shortage of paediatric eye-care professionals and inadequate opportunities for training in paediatric ophthalmology in most low-income countries;
- lack of international exchanges in human resource development for paediatric ophthalmology and insufficiently developed postgraduate curricula for training paediatric ophthalmologists in many industrialized countries;
- fragmentation of paediatric eye-care services in many countries, so that children who need specialist expertise are managed by general ophthalmologists; and
- inadequate provision of special education for children with irreversible visual loss, particularly in low-income countries.

Aim

- to eliminate avoidable causes of blindness in children

Objectives

- to promote programmes that reduce corneal scarring and visual loss from vitamin A deficiency and measles and to implement interventions against harmful traditional practices, neonatal conjunctivitis and eye injuries;
- to provide services to treat children with cataract, glaucoma, retinopathy of prematurity and corneal ulcer or scarring;
- to provide optical services for children with refractive errors, for instance in school eye-health programmes; and
- to provide services for children with low vision.

Strategies

- Provide comprehensive services for children at all levels of service delivery.
- In areas where childhood blindness from preventable diseases is common, increase awareness in the community and encourage primary health care, including specific preventive measures at the primary level, through primary eye care, including:
  - measles immunization, to prevent corneal scarring;
  - vitamin A supplementation, nutrition education, food supplementation and fortification of commonly eaten foods with vitamin A, to control vitamin A deficiency;
  - avoidance of harmful traditional practices, to prevent corneal scarring;
  - ocular prophylaxis of newborns, to prevent neonatal conjunctivitis; and
  - rubella immunization where congenital rubella is an important cause of mortality or morbidity in children, with strategies appropriate to the setting (e.g. schoolgirls aged 12–13 years).
- At the secondary level, strengthen diagnosis and management of less complex cases.
- At the tertiary level, provide specialist training and services for the management of surgically remediable visual loss from cataract, congenital glaucoma and corneal scarring, including long-term follow up. Examine premature infants at risk of retinopathy of prematurity, treat those with severe disease and promote oxygen monitoring.
- As children with cataract often do not present, or present late, undertake active case finding, particularly for girls.
- Provide each child eye-care centre with a well-trained team (e.g. paediatric or child-centred ophthalmologist, optometrist, anaesthetist, counsellor, low-vision therapist, mid-level personnel), appropriate equipment and infrastructure and access to consumables for infants and children (e.g. small spectacle frames, high-power intraocular lenses).
- Ensure the availability of ophthalmologists experienced in indirect ophthalmoscopy to identify premature infants in intensive neonatal care who require treatment for retinopathy of prematurity.

Ensure that infants at risk have fundus examinations starting 4–6 weeks after birth and that infants with severe disease are treated immediately by laser or cryotherapy.

- Develop low-vision services for children with irreversible visual loss at secondary and tertiary levels.
- Promote school eye-health programmes:
  - for the diagnosis and management of common conditions, such as refractive errors, and trachoma and vitamin A deficiency in endemic areas;
  - to promote a healthy environment; and
  - to educate children in looking after their eyes as part of the normal school curriculum.
- In areas where significant uncorrected refractive errors affect more than 2% of schoolchildren aged 11–15 years (29), ensure that children undergo a simple vision screening examination, ideally as part of the school health programme, with provision of spectacles to those who will benefit.
- Ensure that all children in special education establishments are examined by an ophthalmologist and receive medical, surgical, optical or low-vision services to maximize their vision.
- Ensure good linkages between eye-care services and those providing education and rehabilitation services for incurably blind children.

Targets

By 2011, each country's national plan will include the control of blindness in children, with achievable targets.

- For disease control:
  - reduction in the global prevalence of blindness in children from 0.75/1000 to 0.4/1000 by the year 2020;
  - reduction in corneal scarring caused by vitamin A deficiency, measles, neonatal conjunctivitis and the use of traditional eye remedies;
  - reduction in the proportion of blindness due to retinopathy of prematurity, particularly in countries where it is responsible for more than 10% of blindness in children; and
  - appropriate management of children with cataract, with immediate, effective optical correction in suitably equipped specialist centres.
- For human resource development:
  - prevention of blindness in children an explicit aim of primary health care programmes and included in all primary eye-care training curricula;
  - personnel in secondary-level eye clinics with knowledge and skills necessary to manage less complex eye conditions in children; and
  - at least one child eye-care centre with a well-trained team for every 20 million population by the year 2011 and one per 10 million by 2020.
- For infrastructure and technology:
  - all child eye-care centres have adequate supplies of consumables for children, e.g. paediatric aphakic spectacles and low-power, small-diameter intraocular lenses; and
  - secondary-level eye clinics have facilities to provide appropriate spectacles for children with refractive errors.

Indicators

- prevalence of childhood blindness;
- prevalence of avoidable childhood blindness, by cause;
- number of child eye-care centres per at least 20 million population (recommended);
- from other WHO programmes:
  - proportion of countries with measles immunization coverage > 80%;
  - proportion of countries with vitamin A deficiency control programmes or with eliminated vitamin A deficiency, in line with global targets; and
  - proportion of countries with a policy or immunization programme for rubella.

Trachoma

Trachoma, which is the commonest infectious cause of blindness, is caused by Chlamydia trachomatis. Children who have the active stages of the disease are the reservoir of infection, while blindness, which occurs after repeated episodes of infection, principally affects adults. Boys and girls are equally affected by active infection, while blindness is more common in women. Trachoma is a condition of poverty and is a focal disease, affecting communities that have poor water supplies and sanitation and poor health services. The organism is transmitted from person to person through direct and indirect contact and by flies. Blindness can be prevented by surgery to correct inturning of the upper lid (trichiasis), while the infection and its transmission can be reduced with surgery, antibiotics, facial cleanliness and environmental change (the SAFE strategy).

Current situation

Trachoma is endemic in 55 countries: Afghanistan, Algeria, Australia, Benin, Brazil, Burkina Faso, Cambodia, Cameroon, Central African Republic, Chad, China, Côte d'Ivoire, Djibouti, Egypt, Eritrea, Ethiopia, Fiji, Gambia, Ghana, Guatemala, Guinea, Guinea-Bissau, India, Islamic Republic of Iran, Iraq, Kenya, Kiribati, Lao People's Democratic Republic, Libyan Arab Jamahiriya, Malawi, Mali, Mauritania, Mexico, Morocco, Mozambique, Myanmar, Namibia, Nepal, Niger, Nigeria, Oman, Pakistan, Papua New Guinea, Senegal, Solomon Islands, Somalia, Sudan, Togo, Uganda, United Republic of Tanzania, Vanuatu, Viet Nam, Yemen, Zambia and Zimbabwe. The estimated number of affected people has fallen from 360 million in 1985 to about 80 million today. Trachoma affects the poorest and most remote rural areas of Africa, Asia, Central and South America, Australia and the Middle East (30). Updated reports on 36 countries are available (31), while 19 endemic countries have not yet reported data.

There are approximately 10.6 million people with inturned eyelashes (entropion trichiasis), for which eyelid surgery is needed to prevent blindness. The majority of these people are women. An estimated 5.9 million adults are irreversibly visually impaired from corneal scarring due to trachoma.

Achievements

At national level, political support for trachoma control has increased continually since 1997, the year the WHO Alliance for the Global Elimination of Blinding Trachoma (GET 2020) was created; intersector collaboration is growing, and use of the SAFE strategy for eliminating the disease is increasing.

GET 2020 is active at the global level. It is a public–private partnership, bringing together WHO, national coordinators, nongovernmental organizations, donors and international experts, with support from the pharmaceutical industry. Launched in 1997, it was endorsed by WHA Resolution 51.11, adopted in 1998. A nongovernmental organization task force, the International Coalition for Trachoma Control, has been working since 2004 within the framework of GET 2020 to improve information exchange with governments and to coordinate the efforts of international nongovernmental organizations in countries. The GET 2020 secretariat is responsible for trachoma within the WHO department focusing on neglected tropical diseases. The WHO GET 2020 secretariat is also coordinating the drawing up of guidelines for certification of elimination of blinding trachoma, as requested by several WHO Member States.

Limitations

- Not all countries in which blinding trachoma is suspected to be endemic have undertaken a proper assessment of the epidemiological situation of trachoma.
- The WHO SAFE strategy does not yet cover 100% of the populations in trachoma-endemic countries.
- International partners who are members of the WHO GET 2020 Alliance do not implement the entire SAFE strategy, but only certain components.
- The available resources for trachoma control are not sufficient to achieve the ultimate intervention goals in all countries.

Aim

- global elimination of blindness due to trachoma by the year 2020 by applying the WHO-recommended SAFE strategy

Objectives

- Integrate the SAFE strategy into primary health care in all communities with blinding trachoma.
- Certify the elimination of trachoma in countries, where applicable.

Strategies

- Identify districts where blinding trachoma is a public health problem.
- Provide surgical services with trained and certified medical or paramedical staff at community level to operate on cases of trachomatous trichiasis.
- Provide mass antibiotic administration (azithromycin or tetracycline ointment) for populations living in districts where the prevalence of active disease (follicular trachoma) in children aged 1–9 years is above 10%. In districts where the prevalence is below 10% but above 5%, community or family treatment might be required. The treatment interventions must be implemented in association with promotion of personal hygiene, with particular focus on facial cleanliness of children under 10 and improvement of environmental hygiene and sanitation as part of primary health care.
- During the 10th Meeting of GET 2020 (31), the following recommendations were adopted to facilitate implementation of the SAFE strategy:
    - All endemic countries should establish collaboration with the WHO GET 2020 Secretariat.
    - All endemic countries, particularly the more populous countries, should continue to assess the distribution and severity of trachoma, e.g. by rapid assessments.
    - Countries should develop their strategic 5-year national trachoma plans, in collaboration with national and international partners, reflecting the commitment to implement the SAFE strategy; these plans should be integrated into their VISION 2020 national plans (WHA Resolution 56.26).
    - WHO should design methods and tools for assessing the trachoma burden and for certifying elimination of the disease.

- Countries should endeavour to increase coverage of all the components of the SAFE strategy to the highest possible level.
- In countries in which active trachoma prevalence has declined to < 5%, rapid assessment might be the most useful tool for identifying communities that need trachoma control activities as a priority in order to eliminate remaining pockets of the disease.
- Countries should institute an ongoing audit of the quality of trichiasis surgery on the basis of the WHO guidelines for assessment (32).
- Increased intersectoral collaboration should be instituted at national and district levels to ensure comprehensive implementation of all components of the SAFE strategy.
- WHO and the international development community should advocate and promote trachoma as a marker of poverty and GET 2020 as a model of a public–private partnership for tackling the problem.

Target

- By 2020, all 49 countries where endemic trachoma has been confirmed should have achieved their ultimate intervention goals. The countries with plans for achieving those goals are shown in Table 3.

Table 3. Numbers of the 49 countries where endemic trachoma has been confirmed that have or intend to develop plans for achieving their ultimate intervention goals, as agreed by GET 2020

Year	WHO Region			
	Eastern Mediterranean	African	South-East Asian and Western Pacific	Americas
1995	0	0	0	0
2000	5	10	3	1
2010	7	20	5	2
2020	10	30	7	2

Indicators

- number of countries with blinding trachoma as a public health problem;
- proportion of endemic communities covered by the SAFE strategy;
- recommended, where applicable:
  - prevalence of trachomatous entropion trichiasis at district level;
  - prevalence of active trachoma in 1–9-year-olds at district level; and
  - progress in achieving the ultimate intervention goals.

National data are being used to refine ultimate intervention goals and annual intervention objectives in countries. The data are included in WHO information on neglected tropical diseases, in the WHO Global Health Atlas and in the WHO Infobase.

Onchocerciasis

Onchocerciasis is caused by infection with the filarial parasite Onchocerca volvulus, which is transmitted by the blackfly species. The vast majority of the 37 million infected people live in West, Central and East Africa, with smaller foci in Latin America and Yemen. In addition to eye disease and blindness, onchocerciasis also causes a range of skin diseases and other systemic conditions. Currently, about 300 000 people are blind from onchocerciasis. Control measures entail larvicide spraying of blackfly breeding sites and treatment of endemic communities with the microfilaricide Mectizan® (ivermectin).

The WHO Onchocerciasis Control Programme, which operated between 1974 and 2002, covered 11 countries in West Africa (Benin, Burkina Faso, Côte d'Ivoire, Ghana, Guinea, Guinea-Bissau, Mali, Niger, Senegal, Sierra Leone and Togo). The Programme was highly effective, as by 2002 onchocerciasis was no longer a public health problem, except in Sierra Leone and some areas of Benin, Ghana, Guinea and Togo. Intense control activities will continue in these areas until the end of 2007, and surveillance is continuing in all the countries formerly covered by the Programme. Owing to civil conflict, the status of onchocerciasis has deteriorated in Côte d'Ivoire, Guinea-Bissau and Sierra Leone.

Distribution of Mectizan® was begun in six Latin American countries in 1992 (Brazil, Colombia, Ecuador, Guatemala, Mexico and Venezuela) and in 19 African countries that had not been included in the Onchocerciasis Control Programme in 1995 (Angola, Burundi, Cameroon, Central African Republic, Chad, Congo, Democratic Republic of the Congo, Equatorial Guinea, Ethiopia, Gabon, Kenya, Liberia, Malawi, Mozambique, Nigeria, Rwanda, Sudan, Uganda and the United Republic of Tanzania). Both programmes involve partnerships between governments, nongovernmental organizations, United Nations agencies, industry and others. Mass distribution at community level is being undertaken by trained volunteers in all affected areas, except where the disease is hypoendemic (Kenya, Mozambique and Rwanda). Progress has been made in reaching the ultimate treatment goal in most of these countries, apart from Angola, Burundi, Central African Republic, Democratic Republic of the Congo and Sudan, where the therapeutic coverage is below the threshold of 65%, due mainly to political unrest. In 2006, all 13 foci in Latin America had reached a therapeutic coverage of at least 85% for the first time. To achieve therapeutic goals worldwide, distribution of Mectizan® will have to continue for longer than originally envisaged; however, the manufacturers have pledged to continue their donation of the drug for as long as it is needed.

Current situation

The disease is endemic in:

- 30 countries of Africa (Angola, Benin, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Ethiopia, Gabon, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Malawi, Mali, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Sudan, Togo, Uganda and the United Republic of Tanzania);
- 13 foci scattered in six Latin American countries (Brazil, Colombia, Ecuador, Guatemala, Mexico and Venezuela); and
- Yemen (although ivermectin is being distributed in a few communities, technical assistance is needed to determine the current epidemiological status of the disease so that it can be controlled).

Achievements

- At the closure of the Onchocerciasis Control Programme in 2002, 40 million people in 11 countries had been saved from infection and eye lesions, 600 000 cases of blindness had been prevented, and 25 million hectares of abandoned arable land had been reclaimed for settlement and agricultural production, with an economic rate of return of 20%.
- All 13 foci in Latin America had reached a therapeutic coverage of at least 85% by 2006, although eye-related lesions are still found in four foci.
- Since the African Programme for Onchocerciasis Control was launched in 1995, 40 million people in 16 countries have been treated annually, covering 117 000 communities, with the help of more than 250 000 community distributors.

Limitations

- challenges imposed by war, civil unrest and lack of political support in some endemic countries and districts;
- insufficient resources for achieving the ultimate treatment goals;
- slow socioeconomic development in some countries, which jeopardizes implementation of onchocerciasis-related health interventions; and
- limited sustainability of projects should the donation programme be terminated.

Aim

- elimination of blindness due to onchocerciasis

Objectives

- Eliminate blindness due to onchocerciasis by the year 2020.
- Establish sustainable onchocerciasis control programmes in Africa and Yemen by the year 2015.
- Ensure adequate coverage with treatment for onchocerciasis (ultimate therapeutic coverage and geographical coverage).

Strategies

- Establish sustainable national onchocerciasis programmes in all countries where they are needed through international partnerships, mainly for community-directed treatment with ivermectin and local vector control where appropriate.
- Facilitate and contribute to integration and concomitant implementation of interventions involving community-directed treatment with ivermectin to provide multiple health benefits to large populations (e.g. vitamin A distribution, use of impregnated bednets, mass treatment of tropical neglected diseases).
- Establish and implement surveillance for recrudescence of disease.
- Use the available resources more effectively by linking onchocerciasis control with other development agendas.

Targets

- satisfactory coverage with a national onchocerciasis programme in six countries in the Americas, 19 countries in Africa plus Côte d'Ivoire and Sierra Leone (previously covered by the Onchocerciasis Control Programme) and Yemen by 2010 and in all endemic countries by 2015; and
- satisfactory surveillance systems in Benin, Ghana, Guinea and Togo (previously covered by the Onchocerciasis Control Programme) by 2010 and in all endemic countries by 2015.

Indicators

(from the African Programme for Onchocerciasis Control, the Onchocerciasis Elimination Programme in the Americas and special intervention zones of the former Onchocerciasis Control Programme)

- at national level, number of infected persons with or at risk for onchocerciasis;
- number of persons treated annually with Mectizan®, ivermectin;
- coverage with treatment for onchocerciasis:
  - ultimate treatment goal coverage: minimum, 85% (mostly in the Region of the Americas);
  - therapeutic coverage: minimum, 65% (mostly in the African Region); and
  - geographical coverage, 100% (general);
- existence of a satisfactory national surveillance system; and
- incidence of blindness from onchocerciasis.

Age-related macular degeneration

Age-related macular degeneration is the commonest cause of blindness in industrialized countries. Visual loss from this condition is uncommon among persons under the age of 50, but its prevalence is likely to increase in absolute numbers globally as a consequence of population ageing. Age-related macular degeneration has two forms, 'wet' and 'dry'. In most populations, the dry form is the more frequent, but it is less likely to lead to severe bilateral visual loss. The wet form is characterized by the development of abnormal new blood vessels deep to the sensory retina, which can leak or bleed, leading to marked loss of central vision; if bilateral, this can be very disabling. Each year after the onset of wet age-related macular degeneration in one eye, 15% of persons develop the wet form in their second eye. Current options for prevention are limited, but new treatments are being developed to preserve or restore vision in some patients with the wet form.

Current situation

Age-related macular degeneration is responsible for 8.7% of all blindness (3 million persons) due to eye diseases, ranging from close to 0% in sub-Saharan Africa to 50% in industrialized countries. The number affected is expected to double by the year 2020 as a result of the ageing of the world's population. The main risk factors are age, race, smoking, a family history of the condition, hypertension, high cholesterol, high fat intake and high body mass index. The complement factor H gene has also been implicated.

There is currently much interest and research into all aspects of age-related macular degeneration, from risk factors to novel interventions and treatments. There is some evidence that antioxidants and zinc can slow the progression of the condition, but there is less evidence that measures such as lutein and zeaxanthin supplementation and dietary modification have a measurable impact on the incidence of or visual loss from age-related macular degeneration.

Photo-dynamic therapy (i.e. foveal ablation with a low-power laser in combination with a photosensitizing drug, verteporfin) can be offered to selected patients, but the long-term outcomes are not uniformly good. Sequential intravitreal injections of anti-vascular endothelial growth factor agents can improve vision or stabilize visual loss in selected patients, but this treatment is very expensive and is time-consuming for staff and patients. New anti-vascular endothelial growth factor agents are being investigated, and more research is needed. Surgical translocation of the macula and submacular surgery are indicated only for selected patients, as surgery requires highly experienced vitreo-retinal surgeons, and the results are not always favourable. There is currently no treatment for dry age-related macular degeneration.

Limitations

- Treatment is available only for the wet form, and the available treatments are indicated only if the condition is detected early.
- The new anti-vascular endothelial growth factor treatments are very expensive and require ophthalmologists experienced in medical retina and facilities for diagnosis and monitoring.

Aim

- to prevent and reduce vision loss from age-related macular degeneration and improve functioning vision and quality of life of persons with functional low vision

Objectives

- Reduce the incidence of age-related macular degeneration by addressing modifiable risk factors.
- Reduce permanent visual loss from age-related macular degeneration by treatment.
- Enhance functional vision by providing low-vision care.

Strategies

- health education programmes to increase awareness about potentially modifiable risk factors, particularly smoking and obesity;
- regular eye examinations, particularly for persons with symptoms, with prompt referral to centres with appropriate facilities and personnel for diagnosis and treatment of wet age-related macular degeneration; and
- low-vision care.

Targets

(See section on low vision.)

Indicators

- prevalence of blindness and visual impairment due to age-related macular degeneration; and
- recommended, where applicable, coverage of age-related macular degeneration patients with low-vision services

Diabetic retinopathy

Diabetic retinopathy is a well-recognized complication of diabetes mellitus. Well-conducted clinical trials have shown that good control of diabetes and hypertension significantly reduces the risk for diabetic retinopathy, and there is evidence from studies spanning more than 30 years that treatment of established retinopathy can reduce the risk for visual loss by more than 90%. Once vision has been lost due to diabetic retinopathy, it usually cannot be restored, although some forms of retinopathy can be treated by complex vitreo-retinal surgery. Screening programmes for detecting diabetic retinopathy at a stage at which treatment can prevent visual loss and health education programmes are the mainstay of prevention of blindness due to diabetic retinopathy.

Care for diabetic retinopathy is relatively expensive and requires properly trained eye-care professionals. The decisions made by each country are adapted to their resources, social expectations and available health-care infrastructure. Effective services for prevention and treatment of diabetic retinopathy can be provided only if adequate medical services for patients with diabetes mellitus are in place.

Current situation

Diabetic retinopathy is responsible for 4.8% of the 37 million cases of blindness due to eye diseases throughout the world (i.e. 1.8 million persons). The proportion of blindness due to diabetic retinopathy ranges from close to 0% in most of Africa, to 3–7% in much of South-East Asia and the Western Pacific, to 15–17% in the wealthier regions of the Americas, Europe and the Western Pacific (6).

At least 171 million people worldwide have diabetes, and this figure is likely to more than double by the year 2030, to 366 million (33). About 50% of persons with diabetes are unaware that they have the condition, although about 2 million deaths every year are attributable to complications of diabetes. After 15 years, about 2% of persons with diabetes become blind, and about 10% develop severe visual loss. After 20 years, more than 75% of patients will have some form of diabetic retinopathy (34).

Overall, the direct health-care costs of diabetes range from 2.5% to 15% of annual health-care budgets, depending on the prevalence of diabetes and the sophistication of the services available. The costs of lost production can be as much as five times the direct health-care cost according to estimates derived from 25 Latin American countries (35, 36). In some countries, persons known to have diabetes are registered, so that screening programmes can be set up or the coverage of existing programmes be improved.

Achievements

Some low- and middle-income countries are developing models for screening and treatment of diabetic retinopathy, and a WHO working group has recommended public health interventions for its control (34).

Limitations

- Setting up and running valid, cost-effective programmes for screening and treating diabetic retinopathy require highly organized health-care systems, well-trained personnel and sophisticated equipment. In most low-income countries the logistical requirements of screening, treatment and follow-up may be difficult or currently impossible to meet.
- Advanced cases of diabetic retinopathy require tertiary eye-care services, which are not available in many low-income countries.
- Awareness among persons with diabetes about diabetic retinopathy is limited, and compliance with treatment is not always sufficient.
- Comprehensive care of persons at risk for diabetic retinopathy is possibled only in countries in which aequate health-care services for patients with diabetes mellitus are in place.

Aim

- to reduce the incidence of blindness and visual impairment due to diabetic retinopathy

Objective

- Set up systems to prevent diabetic retinopathy and related visual loss, specifically in countries where diabetes mellitus is a public health problem, taking into account the country's resources, social expectations and health-care infrastructure.

Strategies

- Set up or improve services to prevent blindness due to diabetic retinopathy in communities where diabetes is a public health problem and where there are adequate resources.
- Identify persons at risk for visual loss due to diabetic retinopathy by:
  - making available an adequate referral mechanism, so that all patients with diagnosed diabetes mellitus are screened to assess possible eye complications;
  - informing patients with diabetes that the condition affects the eyes;
  - ensuring the accuracy of methods for detecting the presence or severity of diabetic retinopathy; in countries where there are too few retinal specialists to provide comprehensive screening and care, assistants can be trained in the use of specific photographic systems and counselling;
  - ensuring that there are locations for the detection for diabetic retinopathy, which can vary from private offices to hospital-based facilities, mobile health vans or health-care services that move to or take up fixed locations near patients' homes, or referral to comprehensive diabetes centres.
- Provide adequate treatment for diabetic retinopathy, with prevention of vision loss as an integral part of the management of diabetes mellitus, and specific treatment for sight-threatening stages of retinopathy, which should follow clearly defined clinical guidelines for evaluating and treating diabetic retinopathy in a cost-effective manner.
- Provide follow-up care of diabetic retinopathy by making patients aware and motivated and by ensuring that the intervals follow standard international clinical guidelines. It has been observed that high coverage and follow-up rates are achieved when eye care is provided jointly with diabetic care at the same health-care facility.

Targets

- Each country's national VISION 2020 plan for the prevention of blindness includes achievable targets for the prevention and treatment of diabetic retinopathy.

Indicators

- prevalence of blindness and visual impairment due to diabetic retinopathy;
- population per standard eye centre for management of diabetic retinopathy with competent retinal specialists, functional retinal laser and standard diagnostic equipment (recommended at national level);
- population per tertiary eye centre providing comprehensive medical and surgical posterior segment services (recommended at national level); and
- recommended, where applicable, coverage by services (e.g. percentage of diabetic patients who undergo an annual eye examination and percentage of patients with diabetic retinopathy who are treated with retinal laser)

Glaucoma

Glaucoma is not a single disease entity but a group of conditions characterized by damage to the optic nerve (detected by pathological cupping of the optic disc) and loss of the field of vision. The two main types are primary open-angle glaucoma and primary angle-closure glaucoma. Primary open-angle glaucoma is more frequent in whites and Afro-Caribbeans, while primary angle-closure glaucoma is more common in South-East Asia. Glaucoma is uncommon among persons under the age of 40, but the prevalence increases with age. Other risk factors include raised pressure inside the eye (intraocular pressure), a positive family history and belonging to a susceptible ethnic group. Primary open-angle glaucoma cannot be prevented, but acute attacks of primary angle-closure glaucoma and more chronic forms of the disease can be prevented by early detection, followed by laser treatment or surgery to the iris. As the early stages of both types of glaucoma are often asymptomatic, patients often present late, particularly in developing countries. Once vision has been lost, regardless of the type of glaucoma, it cannot be restored.

Current situation

WHO has estimated that 4.5 million people are blind due to glaucoma. Published projections indicate that 4.5 million people will be blind due to open-angle glaucoma and 3.9 million due to primary angle-closure glaucoma in 2010 (37). Furthermore, about 60.5 million people will have glaucoma by the year 2010 (44.7 million with open-angle glaucoma and 15.7 million with angle-closure glaucoma). Given the ageing of the world's population, this number may increase to almost 80 million by 2020. The published projections also indicate that nearly half of the bilateral blindness attributable to glaucoma by 2020 will be caused by angle-closure glaucoma (11.2 million people).

Primary open-angle glaucoma can be managed by long-term use of eyedrops to reduce intraocular pressure or surgery (e.g. trabeculectomy) and should be followed up by long-term monitoring of the visual field, optic disc and intraocular pressure. Detection of eyes at risk of angle closure by assessment of anterior chamber depth or the configuration of the drainage angle of the eye, followed by treatment with laser or surgery to produce an iridotomy or iridectomy can prevent progression to angle-closure glaucoma. Treatment of established primary angle-closure glaucoma requires surgery or medication to reduce intraocular pressure, followed by long-term monitoring.

Achievements

- Research into various aspects of glaucoma is being conducted internationally.
- New anti-glaucoma drugs have been developed, and new treatment options are being evaluated.
- Screening tests for angle-closure glaucoma are being developed and evaluated.

Limitations

- Glaucoma-associated visual impairment and blindness remain difficult to prevent because of the lack of methods to identify persons who are likely to develop substantial visual loss.
- There is lack of awareness in the community about glaucoma and the threat it poses to vision.
- Early diagnosis of primary open-angle glaucoma is difficult, as no single test is sufficiently sensitive or specific for screening populations for glaucoma.
- Assessment for glaucoma of all adults attending eye units is not routine practice everywhere.
- Compliance with daily, lifelong use of eye drops is a challenge in all countries, but particularly so where the cost of medication is relatively high, services are at a distance and understanding of the condition is limited. Under these circumstances, early surgery is recommended.
- In many low-income countries, eye-care services lack the necessary equipment and expertise for diagnosing and managing glaucoma.

Aim

- to reduce visual impairment and blindness from glaucoma

Objectives

- Strengthen human resource development, with adequate training in the diagnosis and management of glaucoma.
- Ensure that eye-care units are adequately equipped for the diagnosis and treatment of glaucoma.
- Ensure that effective, low-cost eye drops are available for lowering intraocular pressure.
- Strengthen advocacy and awareness of possible ways of preventing visual loss due to untreated glaucoma, targeting the public, eye health-care professionals and policy-makers.

Strategies

Interventions for the prevention of blindness due to glaucoma are limited, as the condition is not preventable, patients tend to present late, and there is no simple screening test. The scope of interventions will be largely determined by the socioeconomic status of the country concerned.

- In low-income countries:
  - Ensure that training curricula for ophthalmologists adequately address glaucoma, including the skills needed for diagnosis and treatment.
  - Ensure that training curricula for optometrists and mid-level personnel adequately address glaucoma, including the skills needed for diagnosis.
  - Ensure that training centres are adequately equipped to provide essential services for glaucoma patients and for training personnel.
  - Identify opportunities for diagnosing glaucoma, for example, at the time of refraction testing; before or after cataract surgery.

  - Wherever possible, ensure that basic equipment and low-cost medication are available.
  - Whenever possible, collect data on the prevalence and types of glaucoma and the availability and use of services.
  - In the context of VISION 2020, public health approaches for the control of glaucoma-associated blindness in a given country should be further addressed by an expert group.
- In middle-income countries:
  - Ensure that training curricula for ophthalmologists, optometrists and mid-level personnel, including refractionists, adequately address glaucoma.
  - Ensure that secondary and tertiary eye centres are adequately equipped to provide essential services for glaucoma patients.
  - Ensure that glaucoma screening is part of regular eye checks, particularly for persons at increased risk (e.g. with a positive family history or because of age or ethnicity).
  - Increase public awareness about glaucoma and the risk for visual loss if it is undiagnosed and untreated.
  - Increase compliance with the use of eye drops through health education and counselling.
  - Encourage clinical and operational research.
- In high-income countries:
  - Increase public awareness about the need for early detection of glaucoma through regular eye examinations.
  - Ensure that detection of glaucoma is part of regular eye examinations, e.g. at the time of refraction testing.
  - Increase compliance with the use of eye drops through health education and counselling.
  - Encourage further research on all aspects of glaucoma.

Target

- Each country's national VISION 2020 plan for the prevention of blindness includes achievable targets for reducing blindness due to glaucoma.

Indicators

- prevalence of blindness and visual impairment due to glaucoma; and
- number of countries in which prevention of visual impairment due to glaucoma is adequately addressed in the national VISION 2020 plan for prevention of blindness.

2.3 HUMAN RESOURCE DEVELOPMENT

Human resource development is the second component of the strategy for eliminating avoidable blindness by 2020. The goal is to have in place a sustainable, equitable, comprehensive eye-care system as an integral part of national health systems, based on the principles and practice of primary health care. An appropriately trained workforce serves as the link between infrastructure and technology on the one hand and the processes required to control avoidable causes of blindness and visual impairment on the other.

In many countries, the work force is limited by shortages, low productivity, maldistribution and suboptimal outcomes. Nowhere is this more pronounced than in the poorest countries, where the need is greatest, such as in sub-Saharan Africa and the poorer parts of other developing countries.

This section complements and enlarges on the elements of human resource needs and training described under the other components of VISION 2020.

Aim

- to have in place an appropriately trained, functional, multidisciplinary workforce, that will focus on the coverage, quality and sustainability of eye health services

Current situation

In view of the need for a global report on human resources in eye care, data were collected on various cadres, their training and, to the extent possible, their distribution within countries. The report, Global human resource development assessment for comprehensive eye care, June 2006, is available on the VISION 2020 web site or on CD by request.

Eye-care personnel in general

The categories of health-care and related personnel who provide eye care at different levels of the health-care system vary from country to country. The document refers to only some of the personnel required for comprehensive eye care, who include not only health personnel but also support staff, such as those in management and information technology. Consideration is given to services at community level, which may or may not be part of the formal health-care system. Professionals who provide vision care include opthalmologists, optometrists, ophthalmic nurses, orthoptists, ophthalmic and dispensing opticians and mid-level eye-care personnel. Key areas to be stressed and implemented in order to enhance the effectiveness and efficiency of care delivery are team work and interdisciplinary activities, to optimize the contribution of each team member to reach more people in need.

In many low-income countries, health care is provided informally, that is, by traditional healers, traditional birth attendants, community distributors in onchocersiasis control programmes and 'friends of the eyes' in Gambia. In Pakistan, female health workers act as a bridge between the community and primary health care. Training such persons in primary eye care or at least making them aware of possible harmful practices can help in the identification of potentially sight-threatening conditions such as cataract.

The principles and practice of primary health care necessitate the presence of trained personnel, suitably supported, who provide a link between the community and the formal health system. This service takes various forms across regions and countries, from medical officers through a range of mid-level personnel. Examples of ways in which the elements of primary health care can contribute to the prevention of blindness include:

- immunization to reduce the incidence of blindness from measles concomitantly with distribution of vitamin A supplements, and rubella immunization programmes to reduce the incidence of blindness induced by congenital rubella syndrome;
- intake of vitamin A-rich foods to prevent blindness from vitamin A deficiency;
- promotion of personal and environmental hygiene as part of the SAFE strategy for prevention of blindness from trachoma; and
- treatment of trachoma and onchocerciasis in endemic areas to reduce the prevalence of visual loss from these diseases.

Africa continues to be the Region with the greatest need for human resource development, including for eye care; however the targets set for Africa paradoxically appear to be lower than for other regions: because of the smaller numbers in the health workforce generally, there is a limited pool from which trainees for eye care could be drawn.

Tertiary-level institutions are at the top of the referral chain and provide consultations and treatment for complex conditions that require sophisticated diagnostic equipment and treatment. These centres also serve as training institutions to nurture and conduct relevant research.

Objectives

- Train community health-care workers, where they exist, or adequately qualified persons in the community in primary eye care for preventive education, simple treatment, early detection and referral to health facilities.
- Set up interdisciplinary teams of personnel with complementary skills at all levels of eye-care delivery.

- Develop and promote management and leadership skills in selected personnel, who will comprise the support system for service delivery.
- Train mid-level eye-care personnel as needed, using a core curriculum and the necessary modules, such as for instrument maintenance and repair, low-vision care and simple refraction.
- Organize continuing professional development, as appropriate.

Strategies

- Use a team approach in human resources, in recognition of the multidisciplinary nature of eye care.
- Create an enabling environment for the ophthalmic workforce to enhance their productivity, commitment to eye care and retention.
- Influence government policies to encourage and facilitate human resource development for eye care.

Ophthalmologists

Objectives

- Retain and optimally use existing ophthalmologists.
- Plan for and train new ophthalmologists.
- Where necessary, influence the national plan for human resources for health to help achieve the targets listed below.
- Train ophthalmologists in the required sub-specialities.

Targets

- Achieve a ratio of at least one ophthalmologist per 250 000 population.
- In sub-Saharan Africa, achieve a ratio of 1:400 000 by 2010 and 1:250 000 by 2020.
- In Asia, achieve a ratio of 1:100 000 by 2010 and 1:50 000 by 2020.

Strategies

- Ensure equitable distribution of ophthalmologists in all developing countries by monitoring the availability of required personnel at district level and providing an enabling and supportive environment for job satisfaction.
- Enhance the quality and productivity of existing ophthalmologists and of their training facilities.
- Increase the number of training centres and make optimal use of existing training centres in the country or elsewhere, as appropriate.
- Attract and retain staff by overcoming constraints in the workplace and providing opportunities for continuing professional development.

- Provide specialist training to ensure adequate expertise at secondary and tertiary levels to manage paediatric eye conditions, anterior and posterior segment eye diseases, refraction and low vision.

Indicators

- number of eye-care personnel, including ophthalmologists and mid-level eye-care personnel, per population (preferably disaggregated data, as national averages can be misleading); and
- performance of personnel at different levels of eye-care delivery.

Community eye care

Training in community eye care, which covers a wide range of knowledge and skills, complements clinical ophthalmology and strengthens the capacity of care providers to meet the needs of both individual patients and the community. In the context of VISION 2020, such training augments the capacity of eye-care personnel to identify unmet community needs for eye care and to plan, implement, monitor and evaluate interventions undertaken to meet those needs. Training in community eye health has been recognized as a prerequisite for efficient, effective eye care, especially in developing countries. To this end, training in community eye care has been undertaken in a few regions, but these efforts should be expanded to help countries implement their national VISION 2020 plans.

Objectives

- Integrate community eye care into training curricula for all eye-care providers.
- Develop or strengthen existing community ophthalmology training centres.

Strategy

- Integrate community ophthalmology concepts, principles and practice into residency programmes and other eye-care training programmes.

Indicators

- proportion of residency programmes in a country that have integrated a community ophthalmology module into the training curricula; and
- number of eye-care personnel who have been trained in community ophthalmology (short and long courses)

Optometrists

Objectives

- Optimally use the skills of existing optometrists in primary care programmes with particular emphasis on refractive error and low vision

- Where appropriate plan for and train new optometrists
- Integrate optometrists into primary eye care programmes

Target

- Achieve an appropriate ratio of optometrists per population

Strategies

- Enhance the quality and productivity of existing optometrists and their training facilities
- Increase the number of training centres and make optimal use of existing training centres in the country or elsewhere as appropriate.

Indicator

- Proportion of optometrists per population
- Proportion of optometrists integrated into primary care programmes

Mid-level eye-care personnel

Objective

- Ensure a sufficient number of well-trained mid-level personnel and integrate them into eye-care teams.

Targets

- In sub-Saharan Africa, achieve a ratio of one ophthalmic medical assistant, officer or nurse per 200 000 population by 2010 and a ratio of 1:100 000 by 2020.
- In Asia, achieve a ratio of 1:50 000 by 2010.

Strategies

- Strengthen existing training centres and establish new centres where appropriate.
- Strengthen training of ophthalmic medical assistants in cataract surgery, where appropriate.
- Develop team work.

Indicator

- Proportion of functional ophthalmic medical assistants, officers or nurses per population and, in secondary and tertiary settings, the indicated ratio to ophthalmologists

Refractionists

Uncorrected refractive errors have recently been estimated (7) to account for a staggering 153 million cases of visual impairment alone, not including presbyopia. Most refractive errors can be corrected in a convenient, cost-effective manner, given that well-organized testing and provision of corrective spectacle lenses could be undertaken with a low financial investment. Refraction services are provided by a wide range of personnel, as suitable to each eye health-care system, including optometrists, ophthalmic assistants, opticians and other cadres. The sections on refractive error and low vision in this document give further details.

Objective

- Train sufficient appropriate staff in underserved populations with a high prevalence of uncorrected refractive error.

Target

- Achieve a ratio of one trained functional refractionist per 100 000 population by 2010 and 1:50 000 by 2020.

Strategies

- Strengthen existing training programmes or develop new ones on the basis of local needs, available personnel and resources.
- Revise or design new curricula that include both refraction skills and setting up a spectacle dispensing service.

Indicator

- proportion of functional refractionists per population

Managers

In many countries, human resources and other infrastructure for eye care are not used to their capacity and the infrastructure is grossly inadequate. Although planning, mobilization, coordination and maintenance of resources are essential, these managerial functions are often not carried out owing to lack of trained managers and lack of appreciation of the role of good management. Strong managers and management systems are required, especially in tertiary and secondary eye-care centres.

Objectives

- Enhance the use of human and other resources and thus improve eye care.
- Place personnel trained in management at tertiary and secondary eye-care centres.

Targets

- 80% of tertiary facilities with trained managers by 2010 and 100% by 2020
- 25% of secondary facilities with trained managers by 2010 and 50% by 2020

Strategies

- Train medical and mid-level staff in the principles of management.
- Design and conduct short courses in basic planning and management.
- Train full-time managers in longer courses as needed.

Indicators

- number of personnel trained and
- number of centres with management positions filled.

Equipment technician

Objective

- Train personnel to maintain and repair equipment, produce low-cost spectacles or procure affordable low-vision equipment.

Indicator

- proportion of secondary and tertiary level centres with trained and functional units

Strategies

- short practical courses with refresher training, as required; and
- provision of bio-engineering facilities for maintenance and repair

Targets

- 25% of secondary centres with functioning trained personnel by 2010 and 50% by 2020
- 60% of tertiary centres with functioning trained personnel by 2010 and 100% by 2020

Human resource development infrastructure

Achievement of the goal of eliminating avoidable blindness by the year 2020 will depend on having the required human resources with the right training in place well before.

Global resource centres

VISION 2020 is setting up public eye-health resource centres to provide the necessary support, expertise and resources for training. The centres will offer tuition in a variety of fields, including planning, monitoring, training and access to the literature. At present, only a few centres discharge this responsibility. They will offer the complete range of training and support for developing human resources, infrastructure and technology, service delivery programmes and research, in response to and for the needs of national VISION 2020 programmes. Each global centre will be linked to regional centres to disseminate effective strategies and training of trainers, with the aim of eliminating avoidable blindness. To address the need for tuition in at least the six official languages of WHO, Arabic, Chinese, English, French, Russian and Spanish, six centres should be established.

Regional resource centres

Regional resource centres are facilities that focus their resources, training and programmes on the needs of regional and national VISION 2020 programmes. Their area of coverage will be determined by common language, feasibility of transferring information and skills and availability of resources. Regional resource centres will help strengthen and develop national and local training centres.

National and local training centres

Ultimately, the human resource needs of VISION 2020 will be met by national and local training centres that ensure the training of eye-health personnel. Through links within countries and with regional resource centres, these gateways to training will ensure a workforce that will grow in number, capability and impact.

Objectives

- Recognize existing or promote the establishment of resource centres at global and regional level to support training, programme planning, advocacy and other functions required to increase service delivery.
- Recognize existing or promote the establishment of training centres at national and local level that offer the optimal mix of appropriate training opportunities for a rapid increase in the number of skilled staff and enhancement of the skills of current personnel.

Strategies

- Identify existing centres that can be strengthened to serve as global resource centres.
- Strengthen existing national and local training institutions in their capacity to improve the skills of new and existing eye-health personnel and teams.
- Where needed, promote new national and local training centres in keeping with national VISION 2020 plans and local needs.

Targets

- By 2011, establish at least six global resource centres.
- Assess geographical needs and identify locations for an additional 15 regional resource centres.
- In each country's national VISION 2020 plan, identify at least one collaborating resource centre and one training centre.

Indicators

- numbers of global and regional resource centres and national and local training centres established to address core needs in their target areas; and
- numbers of trained personnel in priority cadres

2.4 INFRASTRUCTURE AND TECHNOLOGY

Infrastructure

Since the launch of VISION 2020, coverage has improved, with a number of new and refurbished eye units acting as referral centres for services provided by district eye-care programmes. Universal coverage is far from being achieved, however, as in many places the infrastructure is inadequate, with no access to a dedicated eye theatre, services covering too large an area and facilities in need of refurbishing and updating. The availability of data on infrastructure has improved to some extent but remains a challenge.

Aim

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

Objectives

- Continue to promote district-level eye-care services and infrastructure, with primary eye care integrated into the primary health-care system, for populations of 0.5–2 million.
- Strengthen existing centres of excellence and enable them to fulfil their clinical and teaching functions.

Strategies

- In the context of the VISION 2020 national plan, identify poorly served areas and engage with partners to secure resources for infrastructure development in those areas.
- Increase use of the available infrastructure by raising awareness in the population served and by promoting good management for resource use and clinical management of patients.
- Support operational research on increasing the productivity of available infrastructure.
- Improve access to the infrastructure by patients by, for instance, providing transport for ophthalmic teams and patients.
- Increase productivity by better use of ophthalmic teams, for example, by setting targets for cataract surgery and introducing management training.
- Address sustainability, such as by ensuring that budget lines for eye care are introduced and effectively disbursed and promoting user fees where appropriate.
- An infrastructure model for low-income countries is described in Technology guidelines for a district eye care programme, which can be obtained at www.v2020.org.

Target

- Set the appropriate targets for infrastructure at primary, secondary and tertiary levels in each country's national VISION 2020 plan.

Indicators

- populations served by primary, secondary and tertiary centres (absolute numbers);
- numbers of primary, secondary and tertiary centres in a country;
- at national level, proportion of health administrative areas with eye-care and cataract surgical services;
- population served by one ophthalmologist or one cataract surgeon; at national level, average size of the population served by one ophthalmologist;
- recommended, with examples of links to other categories of indicator:
  - numbers of district eye units with adequate numbers of trained personnel, improved facilities, established referral networks and community coverage;
  - numbers of primary health-care workers trained in primary eye care;
  - cataract surgical rate (cataract operations per million population per year);
  - availability of affordable spectacles and low-vision devices; and
  - ratio of ophthalmic nurses and assistants, optometrists, refractionists and other personnel to the population served.

Technology

Aim

- to ensure an optimal supply of appropriate, high-quality, affordable equipment, instruments, consumables and resource materials essential for the delivery of eye-care services

Present situation and achievements

In many parts of the world, there are still shortages of usable diagnostic and therapeutic equipment and supplies necessary for practitioners to apply modern techniques to combat blindness. Despite improved access to information technology globally, some eye-care personnel, for instance in rural Africa, do not have easy access to the internet or the information necessary to make the best buy. Much of the information is available only in English. Practitioners are not always consulted in the procurement process, and inappropriate purchases are made by a third party, resulting in equipment that cannot be set up, used, maintained or repaired.

Many eye-care personnel are still not trained to keep their equipment in working order, and there is a shortage of technicians specializing in ophthalmic equipment. Commercial suppliers that can provide service contracts may be too distant from a district eye-care programme or too expensive. As a consequence, equipment is underused, which is frustrating for practitioners and discouraging for patients.

The supply of consumables also presents a problem. Practitioners do not always have information on or access to cost-effective sources, and the supply of medicines and other supplies may be disrupted, because of cost or poor ordering and stock control systems.

Nevertheless, there have been a number of improvements since the launch of VISION 2020. A standard list with guidelines on the equipment necessary for a district eye-care programme is now available on websites and in print and is regularly updated. The guidelines include a section on ordering and stock management. New, affordable products, including operating microscopes, slit lamps and visual field analysers, have been field tested for suitability and robustness before being added to the standard list. Training in equipment maintenance, formerly largely confined to India and West Africa, has also been undertaken elsewhere, including East Africa and Pakistan. Training material in electronic and print forms is now available. Several resource centres, both global and national, supply high-volume items such as consumables, spectacles and low-vision devices, and more information is available in languages other than English.

Objectives

- Continue to give practitioners, hospitals and clinics information on appropriate, high-quality, affordable equipment.
- Ensure the availability of equipment, ophthalmic supplies, spectacles and low-vision devices at costs appropriate to local economies, as and when required.
- Provide appropriate donated equipment to facilities or programmes that cannot afford to purchase.
- Make use of new information technology to improve management efficiency and information exchange.
- Expand the training available for doctors and support staff so that they can maintain and repair their own ophthalmic equipment.
- Continue to increase the availability of material in languages other than English.

Strategies

- Maintain and expand global information about the equipment and supplies needed for effective delivery of eye care, and produce a standard list every 2 years. Continue to provide and improve information, in electronic and print formats and on a regular basis, on equipment and supplies appropriate for the establishment of district eye-care programmes.
- Design similar materials for use in tertiary training centres in developing countries.
- Encourage the donation of suitable, high-quality equipment and supplies to national programmes in countries that cannot afford to purchase. In doing so, consider strategies for overcoming shipping costs or import taxes that might have to be paid by the recipient.
- Increase the number of resource centres that can supply high-volume items in bulk, thereby lowering their cost, and, where appropriate, establish purchasing consortia.
- Encourage manufacturers to produce new, affordable, high-quality items of equipment, to supply information about the care of their products and to provide training in maintenance and repair.

- Monitor new products to determine their suitability.
- Encourage local entrepreneurs to produce basic supplies, such as eye medicines, subject to licensing laws.
- Establish further training for equipment maintenance for all levels of ophthalmic personnel and support staff.
- Increase the availability of information essential for effective delivery of eye care in languages other than English.

Targets

- District and training programmes are well equipped to deliver services.
- The supply of low-cost devices and consumables is uninterrupted.
- All items of equipment needed to deliver services are affordable, robust and of high quality.
- The information needed by practitioners is readily available, accessible and regularly updated.
- Each eye unit has a well-trained staff member who can maintain the equipment.
- There is good access to service for more sophisticated equipment.

Indicators

- existence of regularly updated and expanded information on technology;
- numbers of district eye-care services with adequate equipment, eye medicines and other ophthalmic items (in accordance with appropriate licensing laws and other legal requirements);
- numbers of equipment training programmes and numbers of personnel trained; and
- material available in languages other than English

3. VISION 2020: THE RIGHT TO SIGHT

The global initiative known as 'VISION 2020: the right to sight' was launched in 1999 and is now an established partnership between WHO and the IAPB.

3.1 MISSION, AIMS, GOALS AND OBJECTIVES

To eliminate the main causes of avoidable blindness by the year 2020 by facilitating the planning, development and implementation of sustainable national eye-care programmes based on the three core strategies of disease control, human resource development and infrastructure and technology, incorporating the principles of primary health care. This will be achieved by mobilizing will and passion for action through advocacy and by mobilizing resources.

The vision of VISION 2020 is a world in which no one is needlessly blind and where those with unavoidable vision loss can achieve their full potential. Its aims are to eliminate the main causes of avoidable blindness by the year 2020 and to prevent the projected doubling of avoidable visual impairment between 1990 and 2020.

From the outset, it has been considered that the goal of eliminating avoidable blindness by the year 2020 would best be achieved by integrating an equitable, sustainable, comprehensive eye-care system into every national health system. The initiative is intended to strengthen national health-care systems and facilitate national capacity-building.

The objectives of VISION 2020 are to:

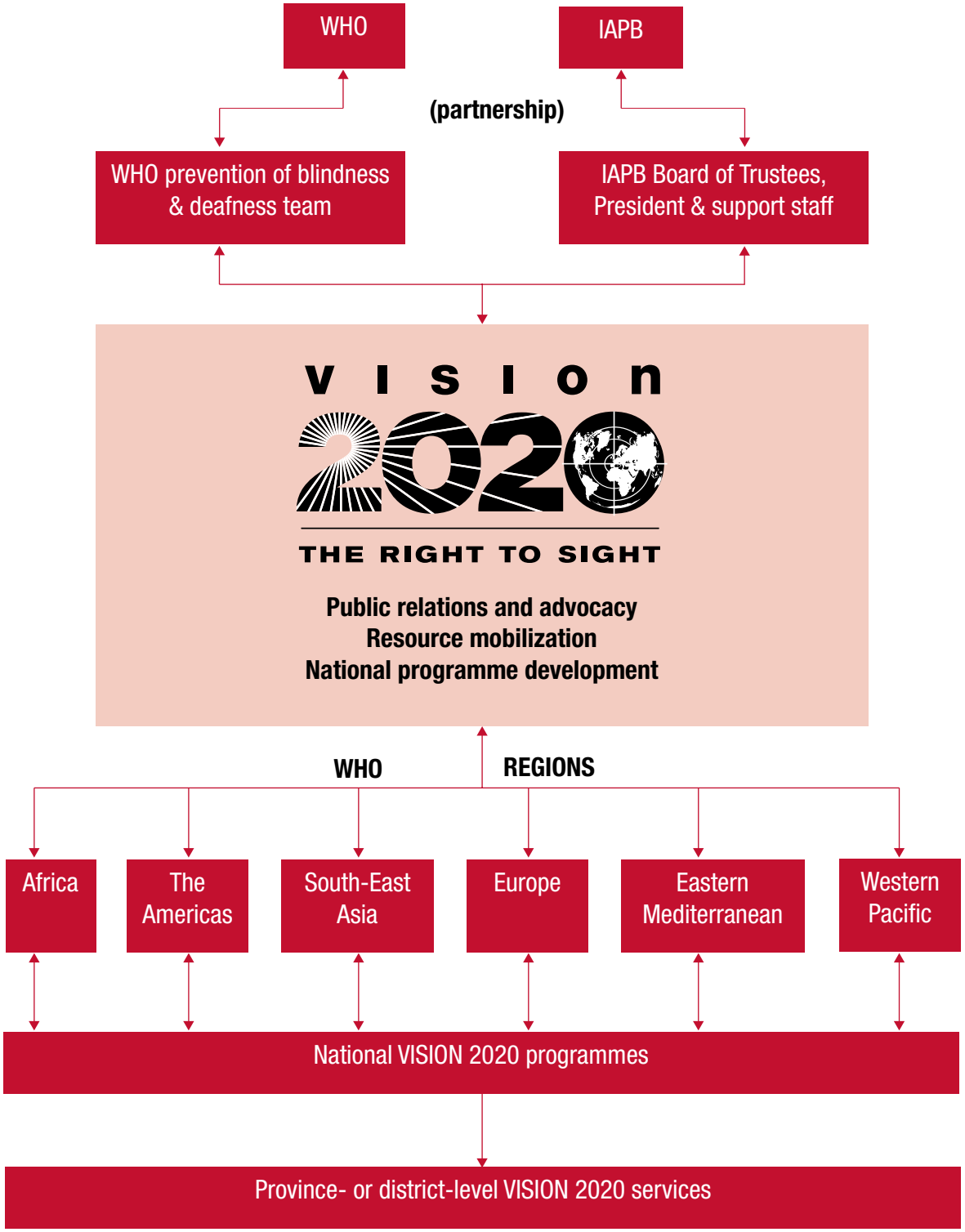
- raise the profile in key audiences of the causes of avoidable blindness and the solutions to the problem;
- advocate for and secure the necessary resources to increase prevention and treatment activities; and
- facilitate the planning, development and implementation of national VISION 2020 programmes in all countries.

National programmes have three main elements: cost-effective disease control, human resource development and infrastructure and technology. VISION 2020 is built on a foundation of community participation. Overarching issues, such as equity, quality of services and visual outcomes, are addressed as part of national programmes.

3.2 STRUCTURE

VISION 2020 is a global collaboration between WHO and the IAPB. It is implemented on the basis of a legally adopted agreement for collaboration on the prevention of blindness. The initiative operates through a network of global, regional and national coordinating bodies (Figure 8), and the work plans for VISION 2020 are determined at periodic meetings of the two organizations.

Figure 8. Structure of VISION 2020



To achieve the goals of the global initiative, the parties were assigned different areas of work in accordance with their mandate or demonstrated competence. Thus, IAPB is responsible mainly for resource mobilization, public relations and mobilizing its member organizations. On the basis of an Executive Board document (EB 105/3), entitled A corporate strategy for the WHO secretariat, issued in 2000, which sets out specific strategic directions and core functions for WHO departments and teams, WHO is primarily responsible for providing technical assistance at national and regional levels in planning eye health care from a public health perspective, data collection and monitoring, dissemination of data for planning and developing a disease control strategy. Both parties contribute at country and regional level according to their mandate and expertise in implementing the global initiative, human resource and infrastructure development and optimal use of available resources.

In addition, the following mechanisms are available for coordinating and implementing prevention of blindness:

- Initiatives and alliances for the control of specific diseases, such as trachoma and onchocerciasis, can serve as coordinating centres for the activities of organizations and individuals working in the same field.
- Technical working groups have been established for each of the diseases identified by VISION 2020 as priorities and for human resource development and infrastructure and technology. These groups suggest programme approaches to achieve the elimination of avoidable blindness.
- WHO collaborating centres for the prevention of blindness are involved in training and research for the prevention of blindness, according to a joint work plan.
- Direct official relations between some nongovernmental development organizations and WHO imply an agreed joint work plan.

3.3 WORLD HEALTH ASSEMBLY RESOLUTIONS ON PREVENTION OF BLINDNESS

A number of World Health Assembly resolutions refer to prevention of blindness. The two most recent ones are the result of advocacy by the partners in VISION 2020.

In 2003, WHO Member States signalled in WHA Resolution 56.26 (Annex I) their commitment to:

- set up, no later than 2005, a national VISION 2020 plan in partnership with WHO in collaboration with nongovernmental organizations and the private sector;
- establish a national coordinating committee for VISION 2020 to help develop and implement the plan;
- commence implementation of such plans by 2007;
- include in their plans effective monitoring and information systems with the aim of showing a reduction in the extent of avoidable blindness by 2010; and
- support the mobilization of resources for eliminating avoidable blindness.

In 2006, World Health Assembly Resolution WHA 59.25 (Annex II) gave renewed support and momentum for this effort, urging Member States to:

- provide support for VISION 2020 plans by mobilizing domestic funding;

- include prevention of avoidable visual impairment in national development plans and goals;
- develop and strengthen eye-care services at all levels, improve access to services and, particularly, integrate prevention of avoidable visual impairment into primary health care;
- encourage partnerships and cooperation between countries; and
- make available essential eye-care medicines and medical supplies.

3.4 IMPLEMENTATION OF VISION 2020 TO DATE

Since the launch of VISION 2020 in 1999, 135 WHO Member States have participated in a VISION 2020 workshop, 107 have formed national committees, and 91 have drafted VISION 2020 national plans (Annex V).

In order to assess the achievements of VISION 2020, WHO set up the Monitoring Committee for the Elimination of Avoidable Blindness, which includes representatives from WHO Regions (1). WHO will continue to provide technical support to strengthen national capability, while fully documenting good practices and models from countries with successful programmes. Progress in implementing VISION 2020 is reported every 3 years to the WHO Executive Board.

3.5 STRATEGIES AND OBJECTIVES FOR THE PERIOD 2006–2008

National programme development

The following approach provides a guide for countries to move towards implementation of VISION 2020 (3):

1. Initiate communication between WHO and IAPB regional offices.
2. Identify a national focal person, in consultation with the WHO country office so that the national programme is in line with the Country Cooperation Strategy (39), which is a medium-term strategic framework for WHO cooperation with a particular country. It represents a balance between country priorities, as analysed by WHO in full consultation with national stakeholders, and regional as well as Organization-wide orientations and priorities. It is a vehicle for WHO alignment with national health and development plans and strategies and for harmonizing WHO's cooperation with the work of United Nations agencies and other health and development partners. The Country Cooperation Strategy is an Organization-wide reference for country work, which guides planning, budgeting and resource allocation. From the point of view of the IAPB, establish a link with the national focal person or other key contact.
3. Identify the key stakeholders, which will include ministries of health, regional and country WHO offices, international and local nongovernmental organizations, professional groups, the private sector and civil society.
4. International nongovernmental developmental organizations might conduct their own consultations to avoid duplication of efforts when several operate in a given country.
5. Determine the composition of the national VISION 2020 prevention of blindness committee.

6. Delineate the various roles and responsibilities of all stakeholders.
7. Perform a comprehensive situation and needs analysis, covering all existing eye-care services and eye-related health issues in a given population.
8. Develop a VISION 2020 prevention of blindness national plan, which should be feasible and appropriate for the country.
9. Implement the VISION 2020 prevention of blindness plan, by generating and using domestic resources rather then relying on external support from international nongovernmental development organizations.
10. Establish monitoring systems to review progress.
11. Assess and evaluate achievements periodically.

Intensified support to selected countries

The intention is to concentrate efforts to ensure progress towards implementing national VISION 2020 plans in 26 countries identified as requiring support. The selected countries are Armenia, Bangladesh, Cambodia, Djibouti, Dominica, Dominican Republic, Ethiopia, Fiji, Guatemala, Guyana, Indonesia, Jamaica, Madagascar, Mali, Morocco, Mozambique, Nigeria, Pakistan, Peru, Philippines, Republic of Moldova, United Republic of Tanzania, Yemen and selected districts or states of China, India and the Russian Federation.

The intensified assistance to these countries is not intended to impose limitations on other countries that are developing national VISION 2020 programmes. In the selected countries, two areas that require immediate attention are:

- provision of technical support for formulating national plans and programmes for the prevention of blindness; and
- improving coordination among the various stakeholders involved in implementation of national VISION 2020 programmes.

Financial sustainability

In order to make national VISION 2020 programmes sustainable, a number of financing mechanisms can be considered:

- Insurance schemes: Private or government health insurance schemes are increasingly available to help patients cover the cost of medical treatment; however, such schemes are still found predominantly in middle- and high-income countries, and most poor population groups still have limited or no coverage. In many instances, such insurance schemes cover only government employees and persons with remunerated posts.
- Government subsidies: Governments have limited and often decreasing resources for eye health care. Additionally, prevention of blindness is usually not seen as a priority, despite the evidence that restoration or preservation of sight is a cost-effective health intervention. Governments should be made aware of the benefits of preventing and curing blindness.
- Cost recovery from patients: Patients with sufficient income can be asked to pay for services, and the revenue can be used to subsidize services for patients with low income, who could not otherwise afford treatment. This model has been used successfully in some Asian countries (e.g. India and

Nepal) but should be adjusted and tested to see whether the model can be used in countries where the demographics, distribution of wealth and financing of health care are different.

- Financial products dedicated to eye care: For instance, bank loan funds are available for approved eye-care projects (e.g. the Eye Fund, under development).

Partnerships between national governments and VISION 2020

Eye-care services in Member States can best be improved if the plan is implemented in collaboration with the Ministry of Health. Integration of comprehensive national plans for the prevention of blindness into the health-care system is the key to large-scale, coordinated action. The inputs of collaborating nongovernmental organizations at international, regional and country level and of the private sector are crucial. It is also essential that ministries of health:

- set and maintain, through an appropriate national committee or similar body, high technical standards and norms;
- issue guidelines where needed;
- coordinate the input of all parties;
- arrange regular monitoring and evaluation of activities and achievements; and
- allocate adequate funds from the health-care budget to carry out VISION 2020 strategies.

The role of VISION 2020 is to encourage and technically support Member States in establishing a national committee, analyse the situation and needs with regard to eye care, develop and implement a national plan for the prevention of blindness and monitor and assess its implementation.

Public relations

The purpose is to raise the profile, relevance and effectiveness of VISION 2020 in key audiences and, in particular, among Governments, bilateral and multilateral development agencies, eye-care professionals, corporate companies and other potential donors, the media and international nongovernmental development organizations.

A number of activities are identified to achieve these objectives. Raising the profile of 'World Sight Day' (held every year on the second Thursday in October) is particularly important. Participation in conferences and development forums, setting up the website and publications and the identification of global, regional and national VISION 2020 ambassadors are further possibilities.

Advocacy

The purpose is to encourage and support national governments and other bodies to implement World Health Assembly Resolutions WHA 56.26 and WHA 59.25 on the elimination of avoidable blindness, to incorporate prevention of visual impairment into national health policies and to include it into the activities of WHO country offices.

Other advocacy objectives are:

- promote 'ownership' of VISION 2020 by eye-care providers and other relevant medical specialists;

- give advocates of VISION 2020 standardized resources and materials, including public relations materials;
- achieve inclusion of World Sight Day in the WHO calendar of events;
- promote effective use of VISION 2020 ambassadors at national, regional and global levels;
- promote recognition by governments and relevant institutions of the need for human resources, particularly in Africa, to address cataract, the main cause of blindness globally;
- promote recognition of the need to train cadres to treat refractive error and low vision in countries identified as priorities;
- promote increased use of cataract outcome monitoring and increase monitoring of the quality of eye health-care services; and
- accelerate efforts in the 26 selected countries to ensure:
  - a national coordinating body;
  - a national VISION 2020 plan; and
  - support from the Government health budget and other sources for implementation of the national programme.

To achieve these goals, it was agreed that establishing a link between VISION 2020 and broader poverty, health and disability development agendas, such as the Millennium Development Goals (Annex III), would be useful.

Resource mobilization

The purpose is to generate additional resources for VISION 2020 programmes and for IAPB organizational operating costs. Means for achieving this would be to:

- identify the characteristics that are most likely to make projects attractive to potential donors;
- identify priorities for resource mobilization;
- demonstrate the link between blindness and poverty and the socioeconomic impact of VISION 2020;
- explore the feasibility of establishing an eye fund to provide loans and grant finance to VISION 2020 programmes;
- widen the corporate membership of IAPB and establish a corporate group to avoid conflicts of interest;
- support the 'Optometry Giving Sight' fund-raising initiative; and
- increase membership income by recruiting new IAPB members.

Improved monitoring and evaluation of VISION 2020 activities will also provide relevant indicators of progress, which can be used to leverage financial and other support.

3.6 COORDINATION AT GLOBAL, REGIONAL AND NATIONAL LEVELS

Despite its relatively short history, VISION 2020 has already demonstrated how global collaboration and partnership can bring about lasting improvement in blindness prevention. During implementation of the initiative, however, a number of issues were identified that must be addressed to further strengthen some areas of WHO–IAPB coordination and information-sharing at all levels, including actual and potential partners, such as professional groups. It was found that some health-care providers involved in VISION 2020 activities had insufficient understanding of the structure and operation of VISION 2020 for the prevention of blindness, and better communication among all stakeholders is needed. It is important to ensure that appropriate messages are delivered by the most appropriate people.

Certain aspects of the coordination of VISION 2020 at global, regional and national levels need to be clarified by explaining how different stakeholders work together. In addition, a more consistent, equitable system of support is required for regional coordination by WHO and IAPB personnel. Establishing stronger links between IAPB and WHO regional and country offices is likely to achieve these and other measures. Similarly, the structure, purpose and role of national VISION 2020 coordinating bodies should be further clarified and strengthened. In this respect, the job descriptions of national coordinators should be better defined and greater support given to them.

3.7 MONITORING AND IMPACT ASSESSMENT

Robust mechanisms for monitoring and evaluation are needed at all levels of VISION 2020 to demonstrate progress. This has been identified as a weakness of the global initiative. Thus, monitoring and evaluation of the impact of VISION 2020 at regional, national and subnational levels, especially the collection of data on eye-care services, require strengthening. If progress in all the activities of VISION 2020 is to continue and accelerate, greater support will have to be provided to national coordinators in collecting and analysing data. Increased efforts to collect and make available data at district, country and regional levels is a critical requirement for the success of VISION 2020, as good information helps ensure that blindness prevention and treatment activities are directed to areas that need them the most.

A set of indicators for monitoring the progress of VISION 2020 was developed in 2002 and revised in late 2006. They are now available for field testing (Annex IV).

REFERENCES

1. WHO Monitoring Committee for the Elimination of Avoidable Blindness. Report of the first meeting. Geneva, 17–18 January 2006. Geneva, World Health Organization, 2006 (WHO/PBL/06.100).
2. World Health Organization. The Global Initiative for Elimination of Avoidable Blindness. Geneva, 1997 (WHO/PBL/97.61 Rev 1).
3. World Health Organization. VISION 2020 Action Plan for 2006–2011Planning Meeting. Geneva, 11–13 July 2006.
4. World Health Organization. International statistical classification of diseases, injuries and causes of death, tenth revision. Geneva, 1993.
5. Thylefors B et al. Global data on blindness. Bulletin of the World Health Organization, 1995, 73:115–121.
6. Resnikoff S et al. Global data on visual impairment in the year 2002. Bulletin of the World Health Organization, 2004, 82:844–851.
7. World Health Organization. Sight test and glasses could dramatically improve the lives of 150 million people with poor vision. Press release, 11 October 2006. http://www.who.int/mediacentre/news/releases/2006/pr55/en/index.html.
8. Taylor H et al. Access economics. Clear insight: the economic impact and cost of vision loss in Australia. Melbourne, Centre for Eye Research Australia, 2004.
9. World Bank. World development report. Washington DC, 1993.
10. Lopez AD et al. Global and regional burden of disease and risk factors, 2001: systematic analysis of population health data. The Lancet, 2006, 367:1747–1757; and comment by Chiang PPC et al. Visual impairment and global burden of disease. The Lancet, 2006, 368: 365.
11. Frick KD, Foster A. The magnitude and cost of global blindness: an increasing problem that can be alleviated. American Journal of Ophthalmology, 2003, 135:471–476.
12. Zhao J et al. Visual acuity and quality of life outcomes in patients with cataract in Shunyi County, China. American Journal of Ophthalmology, 1998, 126:515–523.
13. He M et al. Visual acuity and quality of life in patients with cataract in Doumen County, China. Ophthalmology, 1999, 106:1609–1615.
14. Murthy GVS et al. A population-based eye survey of older adults in a rural district of Rajahstan. Ophthalmology, 2001, 108:686–692.
15. Thulasiram RD et al. The Sivaganga eye survey: II. Outcomes of cataract surgery. Ophthalmic Epidemiology, 2002; 9:313–324.
16. Haider S, Hussain A, Limburg H. Cataract blindness in Chakwal District, Pakistan: results of a survey. Ophthalmic Epidemiology, 2003, 10:249–258.
17. Nirmalan PK et al. A population based eye survey of older adults in Tirunelveli district of south India: blindness, cataract surgery, and visual outcomes. British Journal of Ophthalmology, 2002, 86:505–512.
18. Amansakhatov S et al. Cataract blindness in Turkmenistan: results of a national survey. British Journal of Ophthamology, 2002, 86:1207–1210.
19. Najaryan O et al. Strengthening regional ophthalmic services in Gegharkunik Marz of Armenia: needs assessment. Report to Lions Club International Foundation, Oak Brook, Illinois, 2004.
20. Beltranena F et al. Cataract blindness in 4 regions of Guatemala. Results of a population-based survey. Ophthalmology, 2007 (in press).
21. Wadud Z et al. Rapid assessment of avoidable blindness and needs assessment of cataract surgical services in Satkhira District, Bangladesh. British Journal of Ophthalmology, 2006, 90:1225–1229.
22. Baltussen R, Sylla M, Mariotti S. Cost-effectiveness of cataract surgery: a global and regional analysis. Bulletin of the World Health Organization, 2004, 82:338–345.
23. World Health Organization. Consultation on development of standards for characterization of vision loss and visual functioning. Geneva, 2003. (WHO document WHO/PBL/03.91).
24. World Health Organization. Management of low vision in children (WHO/PBL/93.27). http://ftp.who.int/nmh/Blindness-Library/EN/Blindness/PDFdocs/93_27.pdf.
25. World Health Organization. Asia Pacific regional low vision workshop, Geneva, 2002. (WHO/PBL/02.87). http://ftp.who.int/nmh/Blindness-Library/EN/Blindness/PDFdocs/02_87.pdf.
26. World Health Organization. Preventing blindness in children. Report of a WHO/IAPB scientific meeting. Geneva, 2000. (WHO/PBL/00.77).
27. http://www.unicef.org/specialsession/press/pkimmunization.htm.
28. http://www.measlesinitiative.org/mip2.asp.
29. World Health Organization. Elimination of avoidable visual disability due to refractive error, Geneva, 2000. (WHO/PBL/00.79).
30. http://www.who.int/blindness/data_maps/en/.
31. World Health Organization. 10th Meeting of GET 2020 report. Making progress towards the global elimination of blinding trachoma. Geneva, 2006.
32. World Health Organization. Final assessment of trichiasis surgeons. Geneva, 2005 (WHO/PBD/GET/05.2).
33. World Health Organization. Prevention of blindness from diabetes mellitus. Report of a WHO consultation in Geneva, Switzerland, 9–11 November 2005. Geneva, 2006. International Diabetes Federation. Diabetes atlas, 2nd ed., Brussels, 2003.
34. Barcelo A et al. The cost of diabetes in Latin America and the Caribbean. Bulletin of the World Health Organization, 2003, 81:19–27.
35. Quigley HA, Broman AT. The number of persons with glaucoma worldwide in 2010 and 2020. British Journal of Ophthalmology, 2006, 90:262–267.
36. VISION 2020 Tool kit, http://ftp.who.int/nmh/Vision2020/start.htm
37. http://www.who.int/countryfocus/cooperation_strategy/en/

ANNEX I

WORLD HEALTH ASSEMBLY RESOLUTION WHA 56.26

Elimination of avoidable blindness

The Fifty-sixth World Health Assembly,

Having considered the report on elimination of avoidable blindness;

Recalling resolutions WHA22.29, WHA25.55 and WHA28.54 on prevention of blindness,

WHA45.10 on disability prevention and rehabilitation, and WHA51.11 on the global elimination of blinding trachoma;

Recognizing that 45 million people in the world today are blind and that a further 135 million people are visually impaired;

Acknowledging that 90% of the world's blind and visually impaired people live in the poorest countries of the world;

Noting the significant economic impact of this situation on both communities and countries;

Aware that most of the causes of blindness are avoidable and that the treatments available are among the most successful and cost-effective of all health interventions;

Recalling that, in order to tackle avoidable blindness and avoid further increase in numbers of blind and visually impaired people, the Global Initiative for the Elimination of Avoidable Blindness, known as Vision 2020 – the Right to Sight, was launched in 1999 to eliminate avoidable blindness;

Appreciating the efforts made by Member States in recent years to prevent avoidable blindness, but mindful of the need for further action,

1. URGES Member States:
(1) to commit themselves to supporting the Global Initiative for the Elimination of Avoidable Blindness by setting up, not later than 2005, a national Vision 2020 plan, in partnership with WHO and in collaboration with nongovernmental organizations and the private sector;
(2) to establish a national coordinating committee for Vision 2020, or a national blindness prevention committee, which may include representative(s) from consumer or patient groups, to help develop and implement the plan;
(3) to commence implementation of such plans by 2007 at the latest;
(4) to include in such plans effective information systems with standardized indicators andperiodic monitoring and evaluation, with the aim of showing a reduction in the magnitude of avoidable blindness by 2010;
(5) to support the mobilization of resources for eliminating avoidable blindness;

2. REQUESTS the Director-General:
(1) to maintain and strengthen WHO's collaboration with Member States and the partners of the Global Initiative for the Elimination of Avoidable Blindness;
(2) to ensure coordination of the implementation of the Global Initiative, in particular by setting up a monitoring committee grouping all those involved, including representatives of Member States;
(3) to provide support for strengthening national capability, especially through development of human resources, to coordinate, assess and prevent avoidable blindness;
(4) to document, from countries with successful blindness prevention programmes, good practices and blindness prevention systems or models that could be modified or applied in other developing countries;
(5) to report to the Fifty-ninth World Health Assembly on the progress of the Global Initiative.

Tenth plenary meeting, 28 May 2003
A56/VR/10

ANNEX II

WORLD HEALTH ASSEMBLY RESOLUTION WHA 59.25

Prevention of avoidable blindness and visual impairment

The Fifty-ninth World Health Assembly,

Having considered the report on prevention of avoidable blindness and visual impairment;

Recognizing that more than 161 million people worldwide are visually impaired, of whom 37 million are blind, and that an estimated 75% of blindness is avoidable or curable using established and affordable technologies;

Recalling resolution WHA56.26 on the elimination of avoidable blindness;

Noting that many Member States have committed themselves to providing support for the Global Initiative for the Elimination of Avoidable Blindness, known as Vision 2020 – the Right to Sight;

Noting with concern that only 32% of targeted countries had drafted a national Vision 2020 plan by August 2005;

Acknowledging the links between poverty and blindness, and that blindness places a heavy economic burden on families, communities and countries, particularly developing countries;

Further acknowledging that control of both onchocerciasis and trachoma has come about through the commitment of broad international alliances;

Welcoming the important actions undertaken at regional, subregional and international levels by Member States with a view to achieving substantial progress in the elimination of avoidable blindness through greater international cooperation and solidarity,

1. URGES Member States:
(1) to reinforce efforts to set up national Vision 2020 plans as called for in resolution WHA56.26;
(2) to provide support for Vision 2020 plans by mobilizing domestic funding;
(3) to include prevention of avoidable blindness and visual impairment in national development plans and goals;
(4) to advance the integration of prevention of avoidable blindness and visual impairment in primary health care and in existing health plans and programmes at regional and national levels;
(5) to encourage partnerships between the public sector, nongovernmental organizations, the private sector, civil society and communities in programmes and activities for prevention of blindness at all levels;
(6) to develop and strengthen eye-care services and integrate them in the existing health-care system at all levels, including the training and re-training of health workers in visual health;
(7) to promote and provide improved access to health services both with regard to prevention as well as treatment for ocular conditions;
(8) to encourage integration, cooperation and solidarity between countries in the areas of prevention and care for blindness and visual impairment;
(9) to make available within health systems essential medicines and medical supplies needed for eye care;

2. REQUESTS the Director-General:

(1) to give priority to prevention of avoidable blindness and visual impairment, and to provide necessary technical support to Member States;

(2) to provide support to collaboration among countries for prevention of avoidable blindness and visual impairment in particular in the area of training of all categories of relevant staff;

(3) to monitor progress in the Global Initiative for the Elimination of Avoidable Blindness in collaboration with international partners, and to report to the Executive Board every three years;

(4) to ensure that prevention of blindness and visual impairment are included in the implementation and monitoring of WHO's Eleventh General Programme of Work, and to strengthen global, regional and national activities for prevention of blindness;

(5) to add prevention of blindness and visual impairment to WHO's medium-term strategic plan 2008-2013 and proposed programme budget 2008-2009 which are currently in preparation;

(6) to strengthen cooperation through regional, subregional and international efforts with the view to achieving the goals set out in this resolution.

(Ninth plenary meeting, 27 May 2006 – Committee A, sixth report)

ANNEX III

MILLENNIUM DEVELOPMENT GOALS AND VISION 2020

Achievement of at least seven of the eight Millennium Development Goals could be facilitated by implementing the VISION 2020 Global Initiative, which aims to eliminate avoidable blindness and reduce avoidable visual impairment throughout the world.

Goal 1
Eradicate extreme poverty and hunger

Target 1: Halve, between 1990 and 2015, the proportion of people whose income is less than US$ 1 a day.

Target 2: Halve, between 1990 and 2015, the proportion of people who suffer from hunger.

The facts

- Over 161 million people in the world are visually impaired due to eye diseases, of whom 37 million are blind and 124 million have low vision. Additionally, an estimated 153 million people are visually impaired due to uncorrected refractive errors. At the launch of VISION 2020 in 1999, it was predicted that, without extra interventions, the numbers of people who would lose their sight due to eye diseases would rise to 75 million blind and 200 million visually impaired by the year 2020[1,2,3].
- The largest burden of visual impairment, more than 90%, is borne by the least developed regions.
- As much as 75% of blindness is preventable or curable.
- Many of the causes of avoidable blindness in low-income countries are directly related to poverty, including malnutrition and limited access to health, education, water and sanitation.
- Of the 600 million people with disabilities worldwide, 82% live below the poverty line, 20% belong to the 'poorest of the poor', and only 3–4% benefit from development activities.
- Malnutrition affects 800 million people, causing blindness, illness and death.

VISION 2020

VISION 2020 recognizes the poverty trap of people living with visual impairment, their likelihood of being excluded from basic health, education and social services and thereby their vulnerability to isolation, ill health and economic problems. A successful VISION 2020 initiative would result in a reduction in the projected increase in the number of people who are blind, from 75 million to 24 million. VISION 2020 seeks to ensure the best possible vision for all people, thereby contributing directly to improving quality of life and creating favourable economic, social and health conditions for individuals and society.

---

[1] Resnikoff S et al. Global data on visual impairment in the year 2002. *Bulletin of the World Health Organization*, 2004, 82:844-851.

[2] World Health Organization. *Magnitude and causes of visual impairment*. (Fact sheet No. 282), Geneva, 2004. http://www.who.int/mediacentre/factsheets/fs282/en/print.html.

[3] World Health Organization. *Elimination of avoidable blindness. Report by the Secretariat*. Geneva, 2003.

VISION 2020's strategic objectives contribute to reducing marginalization and poverty by:

- ensuring sustainable, equitable, comprehensive eye-care services at district level, with development of human resources and infrastructure; and
- disease control measures that contribute to improving economic productivity, economic development, health and health equity.

Cataract: VISION 2020 has contributed to increasing both the quality and the quantity of cataract surgery, particularly by the provision of low-cost intraocular lenses and consumables and by developing models of sustainable, equitable provision of cataract surgery.

Refraction and low-vision services: VISION 2020 is striving to make refraction services and corrective spectacles affordable and available to populations in need through primary health-care facilities, school vision screening and low-cost spectacle production. Provision of low-vision services has a positive impact on the recipient's quality of life and increases economic potential.

Childhood blindness: VISION 2020 aims to control both the preventable causes of blindness in children (e.g. measles, congenital rubella syndrome, vitamin A deficiency and meningitis), which are also causes of child mortality, and its treatable causes (e.g. childhood cataract, retinopathy of prematurity and glaucoma), with correction of significant refractive errors and provision of services for low vision.

Trachoma: Trachoma is closely linked to poverty, both as a symptom and as a cause. It is endemic in over 55 countries. VISION 2020 supports elimination of trachoma as a blinding disease by the year 2020 with the SAFE strategy (surgery for inturned eyelids, antibiotics to treat ocular C. trachomatis infection, facial cleanliness and environmental improvement to reduce the risk factors for transmission). This is a holistic approach to eliminating blinding trachoma, which will also help address broader Millennium Development Goals, as it incorporates treatment, information, communication and education, thus leading to better productivity, hygiene and environmental changes.

Onhocerciasis ('river blindness'): Onchocerciasis is a major obstacle to socioeconomic development. It can cause farmers to abandon their land from fear of infection or contribute to decreased productivity. The primary strategy of the African Programme for Oncherciasis Control and the Onchocerciasis Elimination Programme in the Americas, which are in line with VISION 2020 approaches, is community-directed treatment, thus empowering local communities to fight onchocerciasis. Controlling onchocerciasis not only prevents blindness but releases land for safe cultivation and resettlement. Over the next few years, the African Programme intends to treat 90 million people annually, protecting a population at risk of 109 million and preventing 43 000 cases of blindness every year.

Goals 2 and 3
Achieve universal primary education and Promote gender equality and empower women

Target 3: Ensure that children everywhere, boys and girls alike, will be able to complete a full course of primary schooling.

Target 4: Eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education no later than 2015.

The facts

- About 90% of visually impaired children in developing countries are deprived of schooling[4] due to socioeconomic and physical barriers such as discrimination and stigmatization in access to basic education and health services, inability or assumed inability to cope and physically inaccessible schools.
- Blindness in the family results in decreased school attendance and performance, as, for instance, blind adults depend on school-age children and other family members for guidance.

[4] International Council for Education of People with Visual Impairment. *Annual report 2004*. http://www.icevi.org/publications/AnnualReport2004.htm.

- Severe itching from onchocerciasis reduces school performance.
- Women and girls bear approximately two-thirds of the burden of blindness in the world[5]. The social, cultural and economic disadvantages that girls face because of their gender is likely to be accentuated for those with visual impairment, who have a greater risk of being marginalized, neglected and abused. For instance, girls with visual impairment are less likely to attend school than boys.

VISION 2020

The control of blindness in children is a top priority of VISION 2020. Strategies include providing good primary health care with trained personnel and models for the provision of affordable optical correction and low-vision aids.

Public health interventions such as immunization, maternal and child health care, health education, good nutrition, essential drugs, clean water supplies and good sanitation, control of endemic diseases and treatment of common conditions can increase the numbers of boys and girls in school, free from hunger and blindness, and allow them to concentrate on learning and improving their school performance. Moreover, the provision of prevention and treatment services for eye conditions reduces the burden on family members, in particular school-age children. Many strategies are being implemented by VISION 2020 partners, such as vision screening in schools in India, screening for retinopathy of prematurity in Latin America and India, and training in paediatric eye care in India[6].

Goal 4
Reduce child mortality

Target 5: Reduce, by two-thirds, between 1990 and 2015, the under-five mortality rate.

The facts

- Many of the conditions associated with childhood blindness are also causes of child mortality (e.g. premature birth, measles, congenital rubella syndrome, vitamin A deficiency and meningitis). Additionally, conditions of poverty and marginalization put children with impairment at greater risk of contracting secondary illness. Very poor children are four to five times as likely to be blind as those born in high-income countries.
- About 40% of the causes of childhood blindness are preventable or treatable.
- About 500 000 children become blind each year, mostly in developing countries, roughly equivalent to one child becoming blind each minute.
- Up to 60% of children in developing countries are likely to die within 1 year of becoming blind.
- Blindness in mothers and grandmothers reduces their contribution to child care.

VISION 2020

VISION 2020 contributes to lowering the risk for child mortality by controlling childhood blindness through a range of public health interventions, such as maternal and child health, community health, education and specialized child eye care. (See Goal 2.)

Through its trachoma control interventions and adoption of the SAFE strategy, VISION 2020 gives mothers the necessary training and education for hygiene, sanitation and nutrition to improve their own health and that of their children.

[5] World Health Organization. *Fact sheet on gender and blindness*. Geneva, 2002. http://www.who.int/mediacentre/factsheetsfs282/en.

[6] Gilbert C, Foster A. Childhood blindness in the context of VISION 2020–The Right to Sight. *Bulletin of the World Health Organization*, 2001, 79:227–232.,

Goal 6
Combat HIV/AIDS, malaria and other diseases

Target 7: Have halted by 2015 and begun to reverse the spread of HIV/AIDS.

Target 8: Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases.

The facts

- People living with impairment are more likely to be exposed to risk factors that lead to HIV/AIDS, malaria and related illnesses, as they are more susceptible to marginalization, discrimination, illiteracy and poverty[7].
- 90% of people living with HIV/AIDS are cared for at home, usually by girls, mothers, wives and especially grandmothers[8].
- One of the effects of the HIV/AIDS epidemic on eye care is that eye-care workers themselves are succumbing to it. Many large eye clinics and hospitals have lost clinical officers, nurses and doctors to AIDS. Given the shortage of trained personnel, a single death can have a major impact on a programme[9].
- Neglected diseases such as trachoma and onchocerciasis affect at least 1 billion people[10].

VISION 2020

Grandparents are playing an increasing role in the care of people living with HIV/AIDS and AIDS orphans, and the treatment of age-related cataract will contribute to increasing their productive life span.

VISION 2020 partners are working to bridge the gap in human resources for eye care by training ophthalmologists, ophthalmic assistants, primary health-care workers and other eye-care professionals. VISION 2020 is also contributing directly to reducing the burden of trachoma.

Goal 7
Ensure environmental sustainability

Target 10: Halve, by 2015, the proportion of people without sustainable access to safe drinking-water and basic sanitation.

The facts

Environmental degradation is responsible for about 25% of all preventable illnesses in the world[11]. For instance, deforestation can leave areas vulnerable to flooding and landslides, increasing the occurrence of waterborne diseases, leading to diarrhoea, which in turn can cause diseases such as vitamin A deficiency and childhood blindness.

Research in sub-Saharan Africa suggests that people with disabilities have a lower standard of housing and of household health[12].

---

[7] Groce N. *Global survey on HIV/AIDS and disability*. Boston, Yale School of Public Health, 2004.

[8] Help Age International. *MDGs must target poorest say old people. Ageing and Development*, 2005, Suppl.

[9] Lewallen S. HIV/AIDS: What is the impact on prevention of blindness programmes? *Community Eye Health Journal*, 2003, 16:33–34.

[10] World Health Organization. *Goal 6: Communicable disease prevention and control*. Geneva, http://www.who.int/mdg/goals/goal6/communicable_disease_prevention/en/).

[11] World Health Organization. *Health and environment in sustainable development: five years after the Earth Summit*. Geneva, 1997.

[12] Loeb ME, Eide AH eds. Living conditions of people with disabilities in southern Africa–Namibia. Oslo, Foundation for Scientific and Industrial Research (SINTEF) Health Research, 2003.

VISION 2020

Trachoma is the commonest infectious cause of blindness, and an estimated 5.9 million adults are irreversibly visually impaired by corneal scarring due to trachoma, many of whom are among the poorest of the poor. Facilitating access to clean water and sanitation is one of the essential components of trachoma control initiatives implemented by VISION 2020 partners.

Goal 8
Develop a global partnership for development

This goal addresses aid, trade, finance and debt and actions that donor countries should take in support of Millennium Development Goals 1–7.

VISION 2020's strength lies in partnership at all levels. It is a collaboration between the IAPB, representing over 60 international and national organizations involved in the prevention of blindness, and WHO, acting on behalf of its 193 Member States. At regional, national, and community levels, VISION 2020 fosters strong partnerships among ministries of health, international and national organizations, professional organizations and civil society, brought together in national committees for the prevention of blindness or VISION 2020, to facilitate the development of integrated, comprehensive eye-care services .

ANNEX IV

REVISED LIST OF VISION 2020 INDICATORS

The global initiative has identified indicators and proposed a monitoring framework to track progress in the implementation of interventions and the achievement of a set of objectives and targets. A list of indicators was drawn up by a WHO working group in June 2002; however, as the collection of data on eye-care services proved to be challenging, the list was subsequently revised.

Indicators are relevant at global, regional and national levels. In determining the indicators for monitoring VISION 2020, the following issues were addressed:

Broad consensus

VISION 2020 is the collective effort of a number of partners in different disciplines who agreed on a common objective and a common agenda to work towards that goal; therefore, a common monitoring framework is implicit. One of the prerequisites of a monitoring framework is that it be technically sound.

Relevance to VISION 2020 objectives and components

The framework and indicators should reflect the objectives of VISION 2020 directly. They should permit an assessment of the impact of VISION 2020 on the burden of blindness and visual impairment and make it possible to monitor the principal strategies, interventions and related efforts to reinforce eye-care delivery.

Standardized but adaptable approaches

The epidemiology of blindness and visual impairment and health systems vary considerably among countries and regions, and this variation must be taken into account in a monitoring framework and method. It was therefore considered expedient to develop a general framework that covers all situations and to develop a series of indicators that reflect the main variations in blindness patterns and related epidemiology in different countries and in the principal interventions.

Countries and regions are encouraged to select from the basic set those indicators that are the most appropriate for their epidemiological situation and intervention strategy. This approach will ensure standardization of the basic framework and flexibility to suit special circumstances and needs.

Local feedback

The main aim of data collection at community and district levels is to provide feedback to eye-care providers and the health-care system. The monitoring system and the selected indicators should facilitate this process. The information can be used by local decision-makers and stakeholders for planning and management.

Minimal data collection

The chores of record-keeping and reporting are often seen as a needless burden in many health-care settings, and much of the information collected and reported is never used. Only minimal data are to be collected for VISION 2020, and collection should be undertaken only if the data are likely to be reliable and useful for decision-making. Wherever possible, existing mechanisms for data collection, with suitable modification and strengthening, should be used.

The critical data for the objectives of VISION 2020 are on:

- the impact on the burden of blindness and visual impairment;
- related human resource development;
- related eye health sector and technology development; and
- Member States' commitment to implementation of VISION 2020 and development of partnerships.

The framework details the main components of VISION 2020, especially at country level. Reduction and eventual elimination of avoidable blindness will be achieved through interventions that are strengthened or initiated by national VISION 2020 partners, and these partnerships should be monitored. The actual interventions will vary with the pattern and epidemiology of blindness and visual impairment, and with the status of the health delivery system; however, interventions specific to blindness include the whole gamut of eye-health promotion, protection, treatment and at least some forms of rehabilitation. These interventions will require strengthening and therefore monitoring of human resources and relevant components of the health-care system, including health policy, health systems management and service delivery at all levels. Intersectoral collaboration, when called for, should also be monitored.

National interventions require international support. Other critical areas for monitoring are the resources available at national and global levels, the technical support provided to countries and the effectiveness of research and development for new tools and strategies.

1. Indicators for prevalence of visual impairment and disease control

1.1 Indicators for prevalence of visual impairment

Prevalence of visual impairment

Level of collection	National (disaggregated in large countries)
Level of collation	Regional or global
Brief definition	Global, regional and national numbers of blind persons and numbers with low vision
Unit of measurement	Absolute number
Purpose	Programme monitoring, public relations and advocacy
Links to other indicators	Level of development, gender
Underlying definition	Presenting visual acuity < 3/60 and < 6/18–3/60 in the better eye
Measurement method	Estimates from surveys or rapid assessments
Limitations	Requires population-based studies, some of which are of limited generalizability
Frequency	5 years

Prevalence of visual impairment due to avoidable causes

Level of collection	National (disaggregated in large countries)
Level of collation	Regional or global
Brief definition	Global and regional numbers of blind persons and numbers with low vision due to avoidable causes
Unit of measurement	Absolute number
Purpose	Monitoring of trends, public relations and advocacy
Links to other indicators	Level of development, gender
Underlying definition	Presenting visual acuity < 3/60 and < 6/18–3/60 in the better eye
Measurement method	Estimates from surveys or rapid assessments
Limitation	Limited accuracy
Frequency	5 years

1.2 Indicators for control of cataract

Cataract output

Level of collection	National
Level of collation	Regional or global
Brief definition	Number of cataract operations
Unit of measurement	Absolute number
Purpose	Monitor trends, public relations and advocacy
Links to other indicators	Human resource development, infrastructure, appropriate technology, level of development
Underlying definition	Cataract surgery
Measurement method	Compilation from district and national data
Limitations	Incomplete reporting (e.g. private sector)
Frequency	Annual

Cataract surgical rate

Level of collection	National and subnational
Level of collation	Regional or global
Brief definition	Number of cataract operations performed per million population per year; categorization
Unit of measurement	Number of cataract operations plus total population, by country, disaggregated (subnational)
Purpose	To identify countries in need of capacity-building; track trends in output; advocacy at national level

Links to other indicators	Human resource development, infrastructure, appropriate technology
Underlying definition	As above
Measurement method	Compilation from national and subnational (district) data
Limitations	Incomplete reporting (e.g. private sector)
Frequency	Annual

Cataract surgical coverage

Level of collection	National and subnational
Level of collation	Regional or global
Brief definition	Proportion of people with bilateral cataract who have received surgery in one or both eyes (at 3/60 and 6/18 level)
Unit of measurement	Proportion
Purpose	To assess the degree to which cataract surgical services are meeting the need
Links to other indicators	Cataract blindness prevalence; cataract surgical rate
Underlying definition	Proportion eligible for surgery who have received surgery
Measurement method	Estimates from population-based surveys and national data on cataract output
Limitations	Requires population-based studies, which are of limited generalizability
Frequency	5-yearly or more frequently when possible

Intraocular lens implantation rate

Level of collection	National
Level of collation	Regional or global
Brief definition	Proportion of all cataract operations with intraocular lenses
Unit of measurement	Absolute numbers with and without intraocular lenses
Purpose	Proxy measure of quality
Links to other indicators	Cataract output
Underlying definition	Cataract surgery with intraocular lenses
Measurement method	Compilation from regional and national data
Limitations	Incomplete reporting, e.g. private sector
Frequency	Annual

Recommended: Quality of cataract surgery outcome (at level of individual surgeon or surgical centre; various software packages available)

1.3 Indicators for control of refractive errors

Level of collection	National
Level of collation	Regional or global
Brief definition	Proportion of people by age group with uncorrected refractive errors causing visual impairment (i.e. presenting < 6/18 visual acuity in the better eye)
Unit of measurement	Absolute number; prevalence
Purpose	To assess refraction service provision; advocacy for policy and priority setting
Links to other indicators	Demographic data
Underlying definition	Number of persons requiring refraction correction
Measurement methods	Population-based surveys, refraction error service compliance
Limitations	Patient adherence; poor data availability
Frequency	Up to 5 years

1.4 Indicators for control of low vision

Low vision

Level of collection	National
Level of collation	National, regional or global
Brief definition	Number of persons with low vision needing low-vision services
Unit of measurement	Absolute number
Purpose	Programme management, human resource development, advocacy
Links to other indicators	Level of development, gender
Underlying definition	< 6/18–3/60 in the better eye, after standard refraction correction or treatment
Measurement methods	Population-based surveys, refraction service compliance
Limitations	Limited accuracy and limited data
Frequency	5 years

Low-vision care

Level of collection	National
Level of collation	National or regional
Brief definition	Availability of low-vision care services
Unit of measurement	Proportion of countries in which low-vision services are established
Purpose	To assess availability of low-vision care

Links to other indicators	Indicators of refraction services
Underlying definition	Proportion with individuals with low vision who have adequate correction and services
Measurement methods	Rapid assessment
Limitations	May not indicate geographical coverage
Frequency	5 years

1.5 Indicators for control of childhood blindness

Prevalence of childhood blindness

Level of collection	National
Level of collation	Regional or global
Brief definition	Number of blind children per million population; definition of 'childhood' age group
Unit of measurement	Absolute number
Purpose	Track trends in control of avoidable childhood blindness
Links to other indicators	Under-5 mortality, socioeconomic data
Underlying definition	Absolute number per million population
Measurement methods	Population-based surveys, estimates from studies of schools, under-5 mortality rate, childhood blindness registers
Limitations	No established reporting system
Frequency	5 years

Prevalence of avoidable childhood blindness by cause

Level of collection	National
Level of collation	Regional or global
Brief definition	Number of children blind from avoidable causes (must be clearly defined, e.g. vitamin A deficiency, cataract, retinopathy of prematurity) per million population
Unit of measurement	Absolute number
Purpose	Track trends in control of avoidable causes of childhood blindness
Links to other indicators	Under-5 mortality; socioeconomic data; low-birth-weight monitoring
Underlying definition	Absolute number per million population
Measurement methods	Population-based surveys, estimates from studies of schools, under-5 mortality rate, childhood blindness registers
Limitations	No established reporting system
Frequency	5 years

Recommended: Number of child eye-care centres per at least 20 million population

From other WHO programmes:

- proportion of countries with measles immunization coverage > 80%;
- proportion of countries with vitamin A deficiency control programmes or which have eliminated vitamin A deficiency, in line with global targets; and
- proportion of countries with a policy for or implementation of rubella immunization

1.6 Indicators for control of trachoma

Blinding trachoma

Level of collection	Endemic areas
Level of collation	National, regional or global
Brief definition	Number of countries (by category) in which blinding trachoma is a public health problem
Unit of measurement	Number
Purpose	To monitor elimination of trachoma as a cause of blinding
Links to other indicators	GET 2020 5-year plan, in accordance with VISION 2020 national plan; neglected tropical diseases commitment and plan; socioeconomic development
Underlying definition	Countries with new cases of blindness due to trachoma
Measurement methods	From GET 2020 Alliance
Limitations	Data not available for some endemic countries
Frequency	Annual

SAFE strategy coverage (to be decided by GET 2020 Alliance)

Level of collection	Districts in which blinding trachoma is endemic
Level of collation	National, regional or global
Brief definition	Proportion of endemic communities covered by SAFE strategy
Unit of measurement	Ultimate intervention goals; annual intervention objectives
Purpose	To assess coverage and progress
Links to other indicators	Incidence of blinding trachoma
Underlying definition	Progress towards elimination
Measurement methods	Population-based surveys in endemic areas, rapid assessment
Limitations	Resources, socioeconomic development, environmental conditions
Frequency	Annually at GET 2020 meetings or every 3 years in endemic areas

Recommended (where applicable):

- prevalence of trachomatous entropion trichiasis at district level;
- prevalence of active trachoma in 1–9-year-olds at district level; and
- progress in achieving the ultimate intervention goals

National data are being used to refine ultimate intervention goals and annual intervention objectives. The data are included in WHO information on neglected tropical diseases, in the WHO Global Health Atlas and the WHO Infobase.

1.7 Indicators for control of onchocerciasis

Population at risk for onchocerciasis

Level of collection	National
Level of collation	National
Brief definition	Number infected with or at risk for onchocerciasis
Unit of measurement	Absolute number
Purpose	Assess treatment needs
Links to other indicators	Demographic
Underlying definition	
Measurement methods	From African Programme for Onchocerciasis Control, Onchocerciasis Elimination Programme in the Americas and the former Onchocerciasis Control Programme for special intervention zones
Limitations	Data not available from certain areas (e.g. those in conflict)
Frequency	Annual

Treatment for onchocerciasis

Level of collection	National
Level of collation	National
Brief definition	Number treated annually with Mectizan®
Unit of measurement	Absolute number
Purpose	Coverage
Links to other indicators	Number of Mectizan® tablets received
Underlying definition	
Measurement methods	From African Programme for Onchocerciasis Control, Onchocerciasis Elimination Programme in the Americas and the former Onchocerciasis Control Programme for special intervention zones
Limitations	
Frequency	Annual

Coverage with treatment for onchocerciasis (three indicators)

Level of collection	Regional (in the African Programme for Onchocerciasis Control)
Brief definitions	Ultimate treatment goal coverage, minimum 85% (mostly in the Americas Region) Therapeutic coverage, minimum 65% (mostly in the African Region) Geographical coverage, 100% (general use)
Unit of measurement	Proportion of total population at risk receiving treatment
Purpose	Measure coverage

Links to other indicators	Demographic; disease-specific prevalence of blindness
Underlying definition	
Measurement methods	From African Programme for Onchocerciasis Control, Onchocerciasis Elimination Programme in the Americas and the former Onchocerciasis Control Programme for special intervention zones
Limitations	Data not available from certain areas (e.g. those in conflict)
Frequency	Annual

Recommended: Incidence of blindness from onchocerciasis (the target is none)

1.8 Indicators for control of age-related macular degeneration

- prevalence of blindness and visual impairment due to age-related macular degeneration (mostly at national level, e.g. from population-based epidemiological survey); and recommended, coverage of patients with age-related macular degeneration with low-vision services

1.9 Indicators for control of diabetic retinopathy

- prevalence of blindness and visual impairment due to diabetic retinopathy;
- population per standard eye centre for management of diabetic retinopathy with competent retinal specialists, functional retinal laser and standard diagnostic equipment (recommended at national level);
- population per tertiary eye centre providing comprehensive medical and surgical posterior segment services (recommended at national level); and
- recommended, coverage by services (e.g. percentage of diabetic patients who undergo annual eye examination, percentage of patients with diabetic retinopathy who are treated by retinal laser)

1.10 Indicators for control of glaucoma

- prevalence of blindness and visual impairment due to glaucoma; and
- number of countries in which prevention of visual impairment due to glaucoma is adequately addressed in the national VISION 2020 plan for prevention of blindness

2. Indicators for human resource development

Ophthalmologists

Recommended: cataract surgeons, optometrists, refractionists, ophthalmic nurses and assistants, personnel trained in childhood eye care and management (professions must be clearly defined, collection at subnational and national levels)

Level of collection	National (disaggregated in large countries)
Level of collation	Regional/global
Brief definition	Number per million population
Unit of measurement	Absolute number
Purpose	To assess availability of services
Links to other indicators	Performance indicators, cataract surgical rate
Underlying definition	Cadre as defined in country

Measurement method	Health management information system
Limitations	Numbers do not denote performance
Frequency	Annual

3. Indicators for infrastructure and technology

Recommended:

- Quality of surgical service (e.g. visual outcome after cataract surgery, at level of individual surgeon or surgical centre, various software and methods are available)
- Populations served by primary, secondary and tertiary centres (absolute numbers)
- Numbers of primary, secondary and tertiary centres in a country

Eye-care service delivery, geographical coverage

Level of collection	National
Level of compilation	Regional or global where applicable
Brief definition	Proportions of health administrative areas with and without eye-care and cataract surgical services
Unit of measurement	Proportion
Purpose	To identify areas at greatest need of services and to monitor trends in increasing service delivery to the least served
Links to other indicators	Cataract surgical rate
Underlying definitions	Health administrative area, area with a population of 0.5–2 million Cataract surgical services, static facility that can deliver cataract surgical services (as a minimum), by ophthalmologist(s) working in the facility, a trained cataract surgeon working in the facility or a visiting team that goes regularly to the facility to do cataract surgery
Measurement methods	Number of health administrative areas in the country; number with and without cataract surgical services
Limitations	Does not ensure that the population has access to or makes use of the service for a variety of reasons (e.g. distance, cost, fear, ignorance)
Frequency	Annual

Eye-care delivery, population served by one ophthalmologist or cataract surgeon

Level of collection	National (disaggregated in large countries)
Level of compilation	Regional or global where applicable
Brief definition	Average size of the population served by one ophthalmologist
Unit of measurement	Absolute number
Purpose	To identify areas at greatest need for services and to monitor trends in increasing service delivery to the least served
Links to other indicators	Cataract surgical rate
Underlying definition	Ophthalmologist, qualified as defined by country

Measurement method	Health management information system
Limitations	Hides rural–urban distribution
Frequency	Annual

Recommended (including examples of links to other categories of indicators):

- numbers of district eye units with adequate numbers of trained personnel, facilities, established referral networks and community coverage;
- numbers of primary health-care workers trained in primary eye care;
- cataract surgical rate (cataract operations per million population per year);
- availability of affordable spectacles and low-vision devices;
- ratio of ophthalmic nurses and assistants, optometrists, refractionists and other personnel to population served;
- numbers of district eye-care services with adequate equipment, eye medicines and other ophthalmic items (in accordance with appropriate licencing laws and other legal requirements);
- numbers of programmes for training for equipment maintenance and numbers of personnel trained; and
- amount of material available in languages other than English.

4. Country, regional and global indicators of implementation of VISION 2020

National partnership: VISION 2020 prevention of blindness committee

Level of collection	National
Level of collation	National, regional or global
Brief definition	National committees are composed of VISION 2020 stakeholders (e.g. Ministry of Health, eye-care professionals, WHO country office representatives, nongovernmental organizations, civil society and the private sector) and plan, provide resources, implement and monitor in a coordinated manner.
Unit of measurement	Number of countries with a well-established committee
Purpose	To enhance advocacy, mobilize resources, set priorities and increase implementation and coverage
Links to other indicators	VISION 2020 prevention of blindness action plan
Underlying definition	
Measurement methods	Reported by the committee
Limitations	Willingness of partners to work together
Frequency	Periodic review of active committees

National VISION 2020 action plan

Level of collection	National
Level of collation	National, regional or global

Brief definition	Definition of actions for disease control, human resource development, infrastructure and technology, advocacy and community participation
Unit of measurement	Number of countries in which the plan has been adopted
Purpose	To identify needs for eye-care services and resources, to demonstrate a practical commitment to achieve VISION 2020 objectives and set up guidelines for doing so
Links to other indicators	Other national and regional indicators
Underlying definition	Establishment of partnerships among WHO, professionals, nongovernmental organizations, governments, civil society and the private sector Requires assessment of eye-care needs and identification of national requirements to achieve VISION 2020 objectives The plan should cover 20 years, with an initial achievable 5-year implementation plan showing the resources needed to achieve the VISION 2020 goals Should identify the financial requirements Detailed plan for human resource and infrastructure development
Measurement methods	Absolute number of countries with an action plan and percentage of all countries that should have an action plan
Limitations	Difficult to evaluate the success of the plan
Frequency	Periodic review of existing plans being implemented

National VISION 2020 prevention of blindness workshop

Level of collection	National
Level of collation	National, regional or global
Brief definition	Bring together the main national stakeholders to introduce them to the standardized VISION 2020 concept and methods or to develop a national or district prevention of blindness plan of action
Unit of measurement	Successful organization and implementation
Purpose	To assess needs, develop an action plan, mobilize resources to implement the VISION 2020 action plan
Links to other indicators	VISION 2020 action plan
Underlying definition	
Measurement methods	Reported by the national VISION 2020 committee
Limitations	Willingness of partners to work together, availability of resources
Frequency	Periodic review of workshops

Observance of World Sight Day

Level of collection	National
Level of collation	National, regional or global
Brief definition	National observation of World Sight Day (second Thursday in October) to enhance VISION 2020 advocacy and awareness
Unit of measurement	Yes or no, description of activities
Purpose	To enhance VISION 2020 advocacy and awareness
Links to other indicators	Particularly to well-functioning partnerships
Underlying definition	
Measurement methods	Identify the number of countries that recognize World Sight Day
Limitations	The actual effectiveness of communication might be limited
Frequency	Annual

ANNEX V.
IMPLEMENTATION OF VISION 2020 OBJECTIVES BY WHO REGION AT DECEMBER 2006

Please note: The information in this table was provided by VISION 2020 contact persons in country and regional offices and is based on their best available estimates.

Region	Country	Signed[a]	National committee[b]	Workshop[c]	National plan[d]	Cataract surgical rate[e]
African	Algeria	No	No	No	Yes	
	Angola	Yes	Yes	No	No	101
	Benin	No	No	Yes	Yes	357
	Botswana	No	No	Yes	Yes	1637
	Burkina Faso	Yes	Yes	Yes	Yes	265
	Burundi	No	No	Yes	Yes	135
	Cameroon	Yes	Yes	Yes	Yes	704
	Cape Verde	No	No	Yes	Yes	620
	Central African Republic	Yes	No	Yes	Yes	120
	Chad	Yes	No	Yes	No	176
	Comoros	Yes	No	No	Yes	300
	Congo	Yes	No	Yes	Yes	200
	Côte d'Ivoire	Yes	No	No	No	275
	Democratic Republic of the Congo	Yes	Yes	Yes	Yes	78
	Equatorial Guinea	No	No	No	No	95
	Eritrea	Yes	Yes	Yes	Yes	1132
	Ethiopia	Yes	Yes	Yes	Yes	360
	Gabon	Yes	Yes	Yes	Yes	200
	Gambia	Yes	Yes	Yes	Yes	1440
	Ghana	Yes	Yes	Yes	Yes	519
	Guinea	Yes	Yes	Yes	Yes	352
	Guinea-Bissau	No		Yes	Yes	433
	Kenya	Yes	Yes	Yes	Yes	575
	Lesotho	No		Yes	No	380
	Liberia	Yes	Yes	Yes	Yes	81
	Madagascar	Yes	No	Yes	Yes	387
	Malawi	Yes	Yes	Yes	Yes	473
	Mali	Yes	Yes	Yes	Yes	637
	Mauritania	Yes	Yes	Yes	No	1833
	Mauritius	No	No	No	No	2687
	Mozambique	Yes	No	Yes	Yes	185
	Namibia	Yes	No	Yes	Yes	1880
	Niger	Yes	Yes	Yes	Yes	335
	Nigeria	Yes	Yes	Yes	Yes	333
	Rwanda	Yes	Yes	Yes	Yes	131
	Sao Tome and Principe	Yes	No	Yes	Yes	848
	Senegal	Yes	Yes	Yes	Yes	697
	Seychelles	No	No	No	No	4912
	Sierra Leone	No	No	No	Yes	765
	South Africa	Yes	Yes	Yes	Yes	630
	Swaziland	No		Yes	No	210
	Togo	No	Yes	Yes	Yes	464
	Uganda	Yes	Yes	Yes	Yes	331
	United Republic of Tanzania	Yes	Yes	Yes	Yes	543
	Zambia	Yes	Yes	Yes	Yes	518
	Zimbabwe	Yes	No	Yes	Yes	448

Blanks, no information available

[a] Signed the VISION 2020 Global Declaration by December 2006 (WHO/PBL and IAPB data)

[b] Formed a VISION 2020 national committee or prevention of blindness committee by December 2006 (WHO/PBL and IAPB data)

[c] Participated in a VISION 2020 workshop by December 2006 (WHO/PBL and IAPB data)

[d] Drafted a VISION 2020 national plan by December 2006(WHO/PBL and IAPB data)

[e] Cataract surgical rate (number of cataract operations performed per million population within 1 calendar year) (WHO/PBL and IAPB data)

Region	Country	Signed[a]	National committee[b]	Workshop[c]	National plan[d]	Cataract surgical rate[e]
The Americas	Antigua and Barbuda	No	No	No	No	1343
	Argentina	Yes	Yes	Yes	Yes	1900
	Bahamas	No	No	No	No	2500
	Barbados	No	No	Yes	No	2001
	Belize	Yes	No	Yes	Yes	1648
	Bolivia	Yes	No	Yes	No	723
	Brazil	Yes	Yes	Yes	No	2234
	Canada	Yes	Yes	Yes	No	6000
	Chile	Yes	Yes	Yes	Yes	1860
	Colombia	Yes	Yes	Yes	Yes	1700
	Costa Rica	Yes	Yes	Yes	Yes	2210
	Cuba	Yes	Yes	Yes	Yes	2487
	Dominica	No	Yes	Yes	Yes	1746
	Dominican Republic	Yes	Yes	Yes	No	654
	Ecuador	Yes	Yes	Yes	No	812
	El Salvador	No	No	Yes	No	1071
	Grenada	No	No	Yes	No	1785
	Guatemala	Yes	Yes	Yes	No	850
	Guyana	Yes	Yes	Yes	Yes	1700
	Haiti	Yes	No	Yes	No	487
	Honduras	Yes	Yes	Yes	No	615
	Jamaica	Yes	Yes	No	No	1000
	Mexico	Yes	Yes	Yes	Yes	1200
	Nicaragua	Yes	Yes	Yes	Yes	1036
	Panama	Yes	No	Yes	No	1159
	Paraguay	Yes	Yes	Yes	Yes	900
	Peru	Yes	Yes	Yes	Yes	863
	Puerto Rico					
	Saint Kitts and Nevis	No	No	No	No	
	Saint Lucia	No	Yes	No	No	1000
	Saint Vincent and the Grenadines	No	No	Yes	No	
	Suriname	No	No	No	No	
	Trinidad and Tobago	Yes	No	Yes	No	2600
	United States of America		No	Yes	Yes	6500
	Uruguay	No	No	Yes	No	
	Venezuela	Yes	Yes	Yes	Yes	1438
South-East Asian	Bangladesh	Yes	Yes	Yes	Yes	995
	Bhutan	Yes	Yes	Yes	Yes	1019
	Democratic People's Republic of Korea		Yes			200
	India	Yes	Yes	Yes	Yes	4067
	Indonesia	Yes		Yes	Yes	468
	Maldives	No	Yes	Yes	No	700
	Myanmar	No	Yes	Yes	Yes	819
	Nepal	Yes	No	Yes	Yes	1490
	Sri Lanka	Yes	Yes	Yes	Yes	2538
	Thailand	Yes	Yes	Yes	Yes	2090
	Timor-Leste					

Region	Country	Signed[a]	National committee[b]	Workshop[c]	National plan[d]	Cataract surgical rate[e]
European	Albania			Yes		1111
	Andorra					
	Armenia					
	Austria					
	Azerbaijan					
	Belarus					
	Belgium					
	Bosnia and Herzegovina			Yes		1168
	Bulgaria		Yes	Yes		1195
	Croatia			Yes		3180
	Cyprus					
	Czech Republic	No	Yes	Yes	No	5899
	Denmark					
	Estonia	No	Yes	Yes	No	6123
	Finland					
	France					
	Georgia					
	Germany	Yes	Yes	No	No	
	Greece					
	Hungary	No	Yes	Yes	No	5321
	Iceland					
	Ireland					
	Israel					
	Italy					
	Kazakhstan	No	Yes	Yes	No	
	Kyrgyzstan					
	Latvia	No	Yes	Yes	No	2921
	Lithuania	No	Yes	Yes	No	2502
	Luxembourg					
	Malta					
	Monaco					
	Montenegro					
	Netherlands	No	Yes	No	No	
	Norway					
	Poland					
	Portugal					
	Republic of Moldova	No	Yes	Yes	Yes	403
	Romania	No	Yes	Yes	No	1511
	Russian Federation	No	Yes	Yes	No	1600
	San Marino					
	Serbia					1419
	Slovakia					3235
	Slovenia					
	Spain					
	Sweden					
	Switzerland					
	Tajikistan	No	Yes	No	No	
	The Former Yugoslav Republic of Macedonia					
	Turkey					
	Turkmenistan		Yes			455
	Ukraine	No	Yes	Yes	No	1222
	United Kingdom	Yes	Yes	Yes	No	
	Uzbekistan					

Region	Country	Signed[a]	National committee[b]	Workshop[c]	National plan[d]	Cataract surgical rate[e]
Eastern Mediterranean	Afghanistan	Yes	Yes	Yes	Yes	499
	Bahrain	Yes	Yes	Yes	Yes	2175
	Djibouti	Yes	Yes	Yes	No	979
	Egypt	Yes	Yes	Yes	No	692
	Iran (Islamic Republic of)	Yes	Yes	Yes	Yes	1489
	Iraq	Yes	Yes	Yes	No	1187
	Jordan	Yes	Yes	Yes	Yes	1126
	Kuwait	Yes	Yes	Yes	Yes	1308
	Lebanon	Yes	Yes	Yes	No	1700
	Libyan Arab Jamahiriya	Yes	Yes	Yes	Yes	1887
	Morocco	Yes	Yes	Yes	Yes	1706
	Oman	Yes	Yes	Yes	Yes	2401
	Pakistan	Yes	Yes	Yes	Yes	1875
	Qatar	Yes	Yes	Yes	Yes	1036
	Saudi Arabia	Yes	Yes	Yes	Yes	1671
	Somalia	Yes	Yes	No	No	510
	Sudan	Yes	Yes	Yes	Yes	932
	Syrian Arab Republic	Yes	No	Yes	Yes	1757
	Tunisia	Yes	Yes	Yes	Yes	1329
	United Arab Emirates	Yes	Yes	Yes	No	1200
	Yemen	Yes	Yes	Yes	Yes	650
Western Pacific	Australia	Yes	Yes	Yes	Yes	8000
	Brunei Darussalam	Yes	Yes	Yes	No	1104
	Cambodia	Yes	Yes	Yes	Yes	749
	China	Yes	Yes	Yes	Yes	380
	Cook Islands	Yes	Yes	Yes	No	2800
	Fiji	Yes	Yes	Yes	Yes	1354
	Japan	Yes	Yes	Yes	Yes	6830
	Kiribati	No	No	Yes	No	1690
	Lao People's Democratic Republic	Yes	Yes	Yes	Yes	627
	Malaysia	Yes	Yes	Yes	Yes	2290
	Marshall Islands	No		No	No	
	Micronesia (Federated States of)	No		No	No	
	Mongolia	Yes	Yes	Yes	Yes	442
	Nauru	Yes	No	Yes	No	407
	New Zealand	Yes	Yes	Yes	Yes	4001
	Niue	No		Yes	No	0
	Palau					
	Papua New Guinea	Yes	Yes	Yes	No	716
	Philippines	Yes	Yes	Yes	Yes	1200
	Republic of Korea	Yes	Yes	Yes	Yes	2762
	Samoa	No	Yes	Yes	Yes	909
	Singapore	Yes	No	Yes	Yes	4289
	Solomon Islands	Yes	Yes	Yes	Yes	817
	Tokelau	No		No	No	0
	Tonga	Yes	Yes	Yes	No	2039
	Tuvalu	No	No	Yes	No	2647
	Vanuatu	Yes	Yes	Yes	Yes	1539
	Viet Nam	Yes	Yes	Yes	Yes	997

ANNEX VI
PARTICIPANTS AND WORKING GROUP MEMBERS AT THE VISION 2020 STRATEGIC PLANNING MEETING FOR 2006–2011

WHO Headquarters, Geneva, Switzerland, 11–13 July 2006

List of participants

- HRH Prince AbdulAziz Ahmad AbdulAziz Al Saud, IAPB Regional Chair for the Eastern Mediterranean Region, Riyadh, Saudi Arabia
- Professor Adenike Abiose, IAPB Regional Chair for the African Region,. Ibadan, Oyo State, Nigeria
- Mr Peter Ackland, Overseas Programme Director, Sight Savers International, West Sussex, United Kingdom
- Dr Mohamad Alamuddin, Secretary-General, IMPACT, Beirut, Lebanon
- Dr Abdulaziz Al-Rajhi, IAPB Co-Chair for the Eastern Mediterranean, Riyadh, Saudi Arabia
- Dr Adel Al Rushood, IMPACT/ Al-Basar International Foundation, Al-Khobar, Saudi Arabia
- Dr Robert Chappell, President, European Council of Optometry and Optics, London, United Kingdom
- Dr Noel Chua, Director, Institute of Ophthalmology and Visual Sciences, St Luke's Medical Center, Manila, Philippines
- Ms Catherine Cross, Manager, International Programmes, Sight Savers International, West Sussex, United Kingdom
- Mr Brian Doolan, Chief Executive Officer, The Fred Hollows Foundation, Burwood, NSW, Australia
- Dr Rainaldo Duerksen, IAPB Regional Chair for South America, Asuncion, Paraguay
- Dr Hannah Faal, Eye Care Programme Consultant, Sight Savers International, West Africa Regional Office, Accra, Ghana
- Mrs Patricia Ferguson, President, Operation Eyesight Universal, Calgary, Alberta, Canada
- Dr Timothy ffytche, IAPB Regional Chair for the European Region, London, United Kingdom
- Professor Allen Foster, President, Christoffel Blinden Mission, Bensheim, Germany
- Dr David Friedman, Associate Professor, Wilmer Eye Institute and Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, United States
- Dr Xuecheng Gao, Director, Division of General Affairs, Department of Administration, Ministry of Health, Beijing, China
- Mr Christian Garms, Vice-President IAPB, Bensheim, Germany
- Dr Clare Gilbert, Senior Lecturer, International Centre for Eye Health, London School of Hygiene and Tropical Medicine, Clinical Research Unit, London, United Kingdom
- Dr Suzanne Gilbert, SEVA Foundation, California, United States
- Mr Paul Hamilton, Programme Chief, ORBIS International, New York, New York, United States
- Dr Caroline Harper, Chief Executive Officer, Sight Savers International, West Sussex, United Kingdom
- Professor Brien Holden, Chief Executive Officer, CRC, Institute for Eye Research, University of New South Wales, Sydney, NSW, Australia
- Professor Rabiul Husain, IAPB Regional Chair for South-East Asia Region, Chittagong Eye Infirmary and Training Complex Campus, Pahartali, Chittagong, Bangladesh
- Dr Ibrahim Jabr, Vice-President, Programs, International Trachoma Initiative, New York, New York, United States
- Dr Newton Kara José, Professor Titular de Faculdade de Medicina, Ciências Médicas da UNICAMP, São Paulo, Brazil
- Professor Jill Keeffe, Associate Professor, Centre for Eye Research Australia, University of Melbourne, East Melbourne, Australia

- Dr Amir Bedri Kello, International Trachoma Initiative, Addis Ababa, Ethiopia
- Dr Mohamed Daud Khan, Head, Pakistan Institute of Community Ophthalmology, Peshawar, Pakistan
- Dr Van C. Lansingh, Centro de Microcirugia y Laser, Asuncion, Paraguay
- Dr Richard Le Mesurier, IAPB VISION 2020 Coordinator for the Western Pacific Region, Centre for Eye Research Australia, East Melbourne, Victoria, Australia
- Mr Chad MacArthur, Director, Training and Community Education, Helen Keller International, New York, New York, United States
- Professor Yury Maychuk, WHO Collaborating Centre, Department of Infectious and Allergic Eye Diseases, Helmholtz Research Institute of Ophthalmology, Moscow, Russian Federation
- Ms Kicki Nordström, Immediate Past President, World Blind Union, Enskede, Sweden
- Dr Ramachandra Pararajasegaram, Consultant in Prevention of Blindness, Geneva, Switzerland
- Dr Louis Pizzarello, Clinical Professor, College of Physicians and Surgeons, Columbia University, Southhampton, New York, United States
- Mr Richard Porter, Director of Operations, VISION 2020, International Centre for Eye Health, London School of Hygiene and Tropical Medicine, London, United Kingdom
- Dr Gullapalli N. Rao, President, IAPB, L.V. Prasad Eye Institute, Hyderabad, India
- Dr Doulaye Sacko, Coordinator of VISION 2020, West African Health Organization, Bobo-Dioulasso, Burkina Faso
- Dr Grace E.B. Saguti, Coordinator, National Eye Care/Onchocerciasis, Ministry of Health, Dar Es Salaam, United Republic of Tanzania
- Dr Do Seiha, Prevention of Blindness Coordinator, National Programme for Eye Health, Ministry of Health, Phnom Penh, Cambodia
- Dr Farida Sirlan (Chair), Director, Cicendo Eye Hospital, West Java, Indonesia
- Dr Bruce Spivey, President, International Council of Ophthalmology, San Francisco, California, United States
- Dr Hugh Taylor, Director, Centre for Eye Research Australia, University of Melbourne, East Melbourne, Australia
- Dr Ahmed Trabelsi, IABP Regional Co-Chair for the Eastern Mediterranean, President, Nadi Al Bassar, North Africa Centre for Sight and Visual Sciences, Tunis, Tunisia
- Dr Anthony Waddell, Consultant and Technical Editor, Kent, United Kingdom
- Dr Ningli Wang, Director, Beijing WHO Collaborating Centre for the Prevention of Blindness, Beijing School of Ophthalmology, Capital University of Medical Science, Beijing, China

Observers

- Dr Kovin Naidoo, Coordinator Africa, International Centre for Eyecare Education, University of Durban – Westville, Durban, South Africa
- Dr Sanduk Ruit, Medical Director, Tilganga Eye Centre, Kathmandu, Nepal
- Dr Boateng Kwasi Wiafe, Regional Adviser for Sub-Saharan Africa, Operation Eyesight Universal, Accra, Ghana

World Health Organization Regional Offices

- Dr Abdul Hannan Choudhury, Medical Officer, Control and Prevention of Blindness, WHO Regional Office for the Eastern Mediterranean, Cairo, Egypt
- Dr Erline Rasikindrahona, Medical Officer, Prevention of Blindness and Deafness, WHO Regional Office for Africa, Brazzaville, Congo
- Dr Juan Carlos Silva, Regional Advisor for Blindness Prevention, Pan-American Health Organization, Bogotá, DC, Colombia

World Health Organization Secretariat

- Dr Catherine Legales-Camus, Assistant Director-General, Noncommunicable Diseases and Mental Health
- Dr Robert Beaglehole, Director, Chronic Diseases and Health Promotion
- Dr Serge Resnikoff, Coordinator, Chronic Diseases Prevention and Management
- Dr Ivo Kocur, Team Leader, Prevention of Blindness and Deafness
- Dr Silvana de Castro, Prevention of Blindness
- Dr Daniel Etya'alé, Prevention of Blindness
- Dr Silvio P. Mariotti, Prevention of Blindness
- Dr Donatella Pascolini, Prevention of Blindness
- Dr Gopal Pokharel, Prevention of Blindness
- Dr Tony Ukety, Prevention of Blindness

Working group members

Group 1: PAHO–EURO Agenda

- Chair: Bruce Spivey
- Rapporteur: Clare Gilbert
- Members: Bob Chappell, Rainald Duerksen, Pat Fergusson, Tim ffytche, David Friedman, Clare Gilbert, Newton Kara José, Jill Keeffe, Van C. Lansingh, Chad MacArthur, Yury Maychuk, Lou Pizzarello, Juan-Carlos Silva and Bruce Spivey

Group 2: AFRO–EMRO Agenda

- Chair: Mohamed Daud Khan
- Rapporteur: Catherine Cross
- Members: Adenike Abiose, Peter Ackland, Mohamad Alamuddin, Abdulaziz Al-Rajhi, Adel Al Rushood, HRH Prince Al-Saud, A.H. Choudhury, Catherine Cross, Hannah Faal, Abdul Hannan, Ibrahim Jabr, Amir Bedri Kello, Mohamed Daud Khan, Kovin Naidoo, Erline Rasikindrahona, Grace Saguti, Doulaye Sacko, Ahmed Trabelsi and Boateng Wiafe

Group 3: WPRO–SEARO Agenda

- Chair: Rabiul Husain
- Rapporteur: Richard Le Mesurier
- Members: Noel Chua, Brian Doolan, Xuecheng Gao, Suzanne Gilbert, Paul Hamilton, Caroline Harper, Rabiul Husain, Richard Le Mesurier, Kicki Nordstrom, Sanduk Ruit, Do Seiha, Farida Sirlan, Hugh Taylor and Ningli Wang
- Free to join any group: Allen Foster, Christian Garms, Brien Holden, Dick Porter, Nag Rao and the WHO Secretariat.

[1] World Health Organization. A framework and indicators for monitoring VISION 2020—The Right to Sight. Report of a WHO Working Group. Geneva, 2002 (WHO/PBL/03.92).

WORKING TOGETHER TO ELIMINATE AVOIDABLE BLINDNESS

GLOBALLY, UP TO 75% OF BLINDNESS CAN BE PREVENTED OR TREATED

ISBN 978 92 4 159588 9