An estimated 45 million people around the world are blind.¹ Most of them have lost their sight to diseases that are treatable or preventable. Eighty percent of them live in the lesser-developed world in countries where chronic economic deprivation is exacerbated by the added challenge of failing vision. Without intervention, the number of individuals with blindness might reach 76 million by 2020 because of a number of factors, primarily the rapid aging of populations in most countries.² Since eye disease is seen largely in older people, the projected doubling of the world’s population older than 50 years to 2 billion by 2020 has profound effects on the number of those with blindness and low vision.

In response to this global need, the World Health Organization (WHO), Geneva, Switzerland, with the International Agency for the Prevention of Blindness (IAPB), London, England, a partnership of eye care organizations, launched the VISION 2020: The Right to Sight initiative in 1999.³⁴ VISION 2020 aims to eliminate avoidable blindness in the world by 2020 and targets the world’s leading causes of avoidable visual impairment: cataract, trachoma, onchocerciasis, childhood blindness (including vitamin A deficiency), and refractive error and low vision (Figure). In areas of the world where these focal diseases have been controlled, glaucoma and diabetic retinopathy are included among the targeted conditions. To achieve its goals, VISION 2020 requires the training of adequate numbers of eye care providers at all levels and the establishment of critical infrastructure and appropriate technology (Table 1). Just as importantly, VISION 2020 has provided the advocacy that is essential to raise sufficient resources and commitment to attain the goals of the initiative. VISION 2020 is now 4 years into the process. This article summarizes the status of VISION 2020 at this time and provides a description of what lies ahead.

THE IAPB

The IAPB was established in 1975 by the International Council of Ophthalmology and the World Blind Union. It links national programs for the prevention of blindness, nongovernmental organizations (NGOs), educational institutions, individuals, and the founding organizations. In addition, IAPB has an official relationship with the WHO Program on Prevention of Blindness and Deafness based in Geneva, Switzerland, and with the blindness prevention coordinator assigned to some WHO regional offices.

NATIONAL PROGRAMS
AND PLANS OF ACTION

In each country, it is intended that a national blindness prevention committee oversees the VISION 2020 agenda. At this time, national committees have been developed in more than 100 countries. A critically important activity is the development of national plans of action. These plans reflect the priority diseases to be addressed and have been formulated with the input of the major interest groups including the government, ophthalmologists,
public health specialists, NGOs, and others. Once a national plan has been adopted by the government, a coordinated effort can then proceed. Allocation of available resources should reflect the priorities established in the national plan, which will be updated on a 5-year basis.

REGIONAL REPORTS

In each of the 7 regions of IAPB, a chairman coordinates the activities of the VISION 2020 program in partnership with the WHO staff. The regions vary widely in population, level of development, and targeted eye diseases (Table 2). Similar variation can also be seen within a region. Despite this diversity, regional plans have been drafted through a series of regionwide workshops and 5-year plans of action have been developed, which are summarized in this section.

Africa

The Africa region comprises all the countries of sub-Saharan Africa. VISION 2020 was launched in 2000 in Bamako, Mali, and Pretoria, South Africa. The Africa regional plan was reviewed and adopted in Durban, South Africa, in April 2002. A West Africa Advocacy Forum took place in Abidjan, Cote d’Ivoire, in June 2002. Several regional planning workshops have taken place, and several countries are at various stages of development of national plans for blindness prevention. In particular, 4 countries (Nigeria, Democratic Republic of Congo, South Africa, and Ethiopia), representing half of the regional population, have received special attention. Major constraints to program implementation are lack of manpower and monetary resources. However, success can be achieved, as has been demonstrated in a dramatic reduction in blindness rates following the implementation of a national blindness prevention program in the Gambia.6

Programs emphasize the major causes of blindness: cataract, trachoma, onchocerciasis, childhood blindness, and refractive error. Cataract programs have stressed outreach to underserved areas and development of additional surgical manpower. Several courses have been given to assist with the conversion from intracapsular to extracapsular surgery with intraocular lenses. Several individuals have attended management courses to enhance the productivity of existing programs. A team has been trained in financial sustainability of cataract services.

Long-standing programs have targeted onchocerciasis (Onchocerciasis Control Program and the African Program for Onchocerciasis Control) and trachoma (Global Eradication of Trachoma by 2020), and they have been integrated into the regional implementation plan.

As a first step toward addressing childhood blindness, 2 pediatric ophthalmology teams have begun training and a WHO workshop to plan for eye care services for children took place in June 2003. A program for training nonophthalmic health care workers as refractionists is being sponsored by the International Centre for Eyecare Education, Sydney, Australia, and will

### Table 1. Summary of Priority Diseases, Human Resources, and Infrastructure Needs by Region

<table>
<thead>
<tr>
<th>Region</th>
<th>Approximate Population, in Millions</th>
<th>Priority Diseases</th>
<th>Manpower Issues</th>
<th>Infrastructure Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>600</td>
<td>Cataract; trachoma; onchocerciasis; refractive error; childhood blindness</td>
<td>1 ophthalmologist per million people; need to train ancillary health workers</td>
<td>Few facilities exist; needed at every level</td>
</tr>
<tr>
<td>Eastern Mediterranean</td>
<td>400</td>
<td>Cataract; trachoma; childhood blindness; refractive error</td>
<td>Ophthalmologists only in cities; few refractionists</td>
<td>Wide variation in infrastructure</td>
</tr>
<tr>
<td>Europe</td>
<td>1000</td>
<td>Diabetic retinopathy; glaucoma; refractive error and low vision; cataract</td>
<td>Newly independent states with need for training of eye care workers</td>
<td>Upgrade needed for many facilities</td>
</tr>
<tr>
<td>North America</td>
<td>350</td>
<td>Diabetic retinopathy; glaucoma; cataract; low vision</td>
<td>With few exceptions, sufficient manpower, but access is limited</td>
<td>Some Caribbean nations require additional support</td>
</tr>
<tr>
<td>South America</td>
<td>500</td>
<td>Cataract; diabetic retinopathy; childhood blindness; glaucoma; refractive error</td>
<td>Maldistribution of manpower; need in rural areas</td>
<td>Improved facilities in rural and poor urban areas</td>
</tr>
<tr>
<td>Southeast Asia</td>
<td>1600</td>
<td>Cataract; childhood blindness; refractive error and low vision; diabetic retinopathy; corneal infections; glaucoma</td>
<td>Training for all levels of eye care in some countries; some have adequate resources</td>
<td>Broad updating needed in some areas</td>
</tr>
<tr>
<td>Western Pacific</td>
<td>1700</td>
<td>Cataract; refractive error and low vision; diabetic retinopathy</td>
<td>Midlevel eye care workers are needed in most areas and widespread primary eye care training is needed for all community health workers</td>
<td>Many areas need upgrading, especially for cataract and diabetic eye disease management</td>
</tr>
</tbody>
</table>
make refractive services available in rural locations.

To further strengthen ophthalmic manpower, the East Africa College of Ophthalmologists, Moshi, Tanzania, is developing. This will permit the pooling of training resources both to enhance existing educational opportunities for ophthalmology resident physicians as well as increase the number of training places. Priority actions for the next 5 years include:

- Completion of national VISION 2020 plans along with the mobilization of necessary resources for immediate implementation of all completed plans.
- Establishment of a regional database of available manpower, infrastructure, and other resources. At the same time, critically deficient areas will be identified and a priority list of needs will be created.
- Development of all cadres of middle-level manpower to serve community needs.
- Development of collaborative regional training programs for ophthalmologists to improve the quality of education and to increase the number of trainees.
- Development of appropriate and sustainable mechanisms for supply of equipment, drugs, and consumables.

*Eastern Mediterranean*

Stretching from Morocco in the west to Pakistan in the east, this region of 400 million people has a diversity of climates, populations, and eye diseases. Following the regional launch of VISION 2020 in Egypt, national launches took place in Tunisia, Saudi Arabia, Yemen, Sudan, and several other countries. National plans of action are being formulated in several countries.

Targeted diseases include cataract, trachoma, childhood blindness, and refractive error. Many countries are part of the Global Eradication of Trachoma 2020 initiative and some, like Morocco, have enjoyed significant success with the SAFE strategy* for trachoma control. Training for improved cataract surgical care has taken place in many areas. Intra-regional cooperation has been strong, with teams from Tunisia visiting other nations.

*Europe*

The Europe region is defined as extending from Greenland to the eastern tip of Siberia, containing 50 countries across 16 time zones with nearly 1 billion inhabitants. VISION 2020 was launched in Geneva in 1999. Since that time, a number of regional meetings have taken place and a regional implementation plan is being crafted.

Target diseases vary by geography: diabetic retinopathy, glaucoma, and low vision services in Western Europe and cataract, childhood blindness, diabetic retinopathy, glaucoma, and low vision services in the eastern areas. There is no shortage of eye doctors, but in the eastern areas, the distances between major centers are vast, statistics on blindness in the region. There is no shortage of eye doctors, but in the eastern areas, the distances between major centers are vast, statistics on blindness are not available, prevention programs are limited, and ophthalmic medications and equipment are difficult to obtain, as are textbooks and journals.

Activities in the early stages of VISION 2020 in Europe have been directed toward the training of ophthalmologists in the eastern areas. Training courses and short-term teaching visits have linked eye specialists in Western Europe with those in Eastern Europe. The VISION 2020 “triplet” is one example of these linkages, where a training center in the West develops a course in a center in the East. Certain existing centers have received support to develop eye care units from a number of NGOs including Christoffel Blindenmission, Bensheim, Germany; Orbis International, New York, NY; Lions International, Oak Brook, Ill; and Organization pour la Prevention de la Cécité, Paris, France. Future activities will include:

- Strengthening data-gathering capacity to improve the quality of statistics on blindness in the region.
- Improving local eye care services by creating more eye care units, training additional ophthalmologists and other eye care workers, and emphasizing the adoption of blindness prevention programs in the various national plans.

*North America*

Canada, the Caribbean, and the United States form the North America region. The range of technical sophistication and health ex-

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Table 2. Strategies for Dealing With the Leading Causes of Blindness

<table>
<thead>
<tr>
<th>Disease</th>
<th>Description of Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cataract</td>
<td>Extracapsular cataract surgery with intraocular lens</td>
</tr>
<tr>
<td></td>
<td>This will require the training of additional cataract surgeons</td>
</tr>
<tr>
<td>Trachoma</td>
<td>Bilamellar rotation surgery for lids scarred by entropion</td>
</tr>
<tr>
<td></td>
<td>Antibiotic distribution with tetracycline or azithromycin*</td>
</tr>
<tr>
<td></td>
<td>Facial cleanliness*</td>
</tr>
<tr>
<td>Onchocerciasis</td>
<td>Ivermectin distribution*</td>
</tr>
<tr>
<td>Childhood blindness</td>
<td>Nutrition education and when necessary, vitamin A distribution*</td>
</tr>
<tr>
<td>Vitamin A deficiency</td>
<td>Surgical teams trained and equipped</td>
</tr>
<tr>
<td>Cataract</td>
<td>Neonatal centers made aware of the need for screening of neonates with appropriate referral</td>
</tr>
<tr>
<td>Refractive error</td>
<td>Refractionists trained in the determination of visual correction and making affordable spectacles</td>
</tr>
<tr>
<td>Low vision</td>
<td>Training of low-vision specialists</td>
</tr>
<tr>
<td>Diabetic retinopathy</td>
<td>Provision of affordable low-vision aids</td>
</tr>
<tr>
<td>Glaucoma</td>
<td>Development of appropriate screening tools to identify those with the disease</td>
</tr>
<tr>
<td></td>
<td>Education of the public about glaucoma and the need for its detection and treatment</td>
</tr>
</tbody>
</table>

*Cost per individual treated is $2.00 or less.
penditure varies widely within the region. With the exception of a few Caribbean countries, VISION 2020 targets the major causes of blindness, cataract, diabetic retinopathy, glaucoma, and refractive error and low vision.

Canada supports an excellent health care system with the highest of technological standards. There are some issues of access to care in certain rural areas, but in general, care is widely available. A National Coalition for Vision Health (Toronto, Ontario) has been created, which brings together NGOs, universities, health care providers, and consumers. The coalition is working with the national government to develop a strategy to deal with the increasing rates of blindness seen in an aging population.

In the Caribbean, a highly successful collaborating group has coordinated activities in the subregion and developed a 5-year strategic plan. Cataract, glaucoma, diabetic retinopathy,-refraction and low vision, and children’s services are the priorities for the program. Specific targets have been set for each of these conditions as well as staffing standards for ophthalmologists, nurses, and assistants. New programs for diabetic-retinopathy screening are being established in Dominica, and school-based screening will be starting in Antigua and Jamaica. Sight Savers International of Western Sussex, England, has been very supportive of these activities.

The United States has developed the Healthy Vision 2010 program. Its 10 objectives cover the leading causes of vision loss in the country. Specific targets are being developed at this time for each of the objectives, which include diabetic retinopathy, glaucoma, cataract, occupational eye injury, refractive error and low vision, vision rehabilitation, and childhood screening and treatment. Healthy Vision 2010 will be the strategic plan for blindness prevention for the next 10 years.

In the next 5 years, priorities will be:

- Strengthening the Coalition for Vision Health in Canada as well as the creation of an effective VISION 2020/Canada committee linking all the NGOs based in Canada.
- Implementation of the strategic plan for the Caribbean founded on a rights-based agenda for action, including the right to inclusion for those with vision loss and the right to sight for all.
- Successful implementation of the Health Vision 2010 program in the United States.
- Continued strengthening of intraregional communication and cooperation.

**South America**

This region includes all of Central and South America with a population of 400 million. VISION 2020 was launched in Natal, Brazil, in 2000. In July 2001, a regional working group was established to implement VISION 2020 and, subsequently, links have been forged between IAPB and existing organizations including the Pan American Health Organization, Washington, DC, and the Pan American Association of Ophthalmology, Arlington, Tex, both of whom have worked for years in the area of blindness prevention. Five subregional groups have been established, and chairpeople have been appointed for each. National VISION 2020 implementation plans have been developed for Colombia and Bolivia. Plans are in formulation in Paraguay, Mexico, Argentina, and Uruguay.

Target diseases include cataract, childhood blindness, refractive error and low vision, and diabetic retinopathy. There are several limited foci of onchocerciasis, which are being treated. Each year more than 130 ophthalmologists and other health professionals take part in training courses organized by the London School of Tropical Medicine, London, England; the International Centre for Eye Health, London, England; and the IAPB. These courses encourage the participants to develop community eye health projects, which are aimed at improving cataract surgical rates, detection and treatment of retinopathy of prematurity, and low vision and refractive services at the district level. In addition, the Pan American Health Organization has begun a rapid assessment of cataract surgical services in a number of countries.

A protocol to detect and treat retinopathy of prematurity, the principal cause of childhood blindness in the region, was validated and approved by the IAPB Childhood Blindness subcommittee. This protocol is now being implemented in a number of neonatal units in the main cities of the region. Bolivia has incorporated the treatment of retinopathy of prematurity, as well as congenital cataract, into maternal and child health insurance for the first time.

Financial support for all of these programs has come from Christoffel Blindenheimission; ONCE (a Spanish NGO), Madrid, Spain; and the Mirada Solidaria Foundation, Bilbao, Spain. During the next 5 years, the priorities will be:

- Improving the training of ophthalmologists in blindness prevention programs.
- Developing national blindness prevention plans in all countries in the region.
- Improving the cataract surgical rate where needed.
- Strengthening childhood blindness programs, in particular the recognition and treatment of retinopathy of prematurity.

**Southeast Asia**

This region covers 11 countries—India, Nepal, Bangladesh, Indonesia, Timor Leste, Myanmar, Bhutan, Maldives, Sri Lanka, Thailand, and North Korea—with a combined population of 1.6 billion. Following the regional launch of VISION 2020, an intercountry consultation convened in Jakarta, Indonesia, in February 2000 by the WHO South-East Asia Regional Office. National plans of action have been developed in India and Nepal and have received budgetary allocations from those governments. Several other countries are in the process of formulating national plans. In India, the Right to Sight India Forum is being established to bring together the international NGOs working there with the hundreds of national NGOs working in blind-
Target diseases are cataract, childhood blindness, refractive error and low vision, diabetic retinopathy, corneal infections, and glaucoma. A key strategy supporting all of these programs will be human resource development, in particular the development of midlevel ophthalmic personnel and training for integration of primary eye care into primary health care. Management training is being carried out at the Lions Aravind Institute of Community Ophthalmology, Aravind Eye Hospital, Madurai, India, for heads of eye hospitals, program managers, hospital administrators, and midlevel ophthalmic personnel. A regional workshop on childhood blindness was held in Bangladesh in January 2003. With more than 150 participants, this gathering helped to sensitize both ophthalmologists and policy makers to the importance and the process of developing eye care services for children. A training course on pediatric eye surgery has been developed at the L.V. Prasad Eye Institute in Hyderabad, India. Teams consisting of ophthalmic surgeons, anesthetists, and midlevel personnel can then return to their own institution and set up pediatric eye care facilities. Priorities for the next 5 years for the region include:

- Implementation of national plans in all countries of the region.
- Strengthening of pediatric eye care services in the region.
- Development of midlevel eye care personnel in all countries.

**Western Pacific**

This region, including China, is the most populous with 1.7 billion people. It stretches from Mongolia, across eastern Asia, to the island nations of the Pacific. It spans the economies of highly industrialized nations to the microstates of the South Pacific, with the attendant diversity of eye care services. Following the regional launch of VISION 2020 in 1999, there have been formal declarations of support for VISION 2020 in Australia, Cambodia, China, Cook Islands, Japan, Laos, Malaysia, New Zealand, Philippines, and Vietnam. Korea and Mongolia plan declarations this year. De facto support for VISION 2020 exists in Fiji, Papua New Guinea, Singapore, Solomon Islands, Tonga, Tuvalu, Vanuatu, and Western Samoa. Together, these 20 countries represent the majority (20/26) of states in the Western Pacific region. VISION 2020 workshops have been held in nearly every country, and national plans are in varying stages of formation in most nations.

Targeted diseases vary by country with cataract still a major cause of blindness in some nations, whereas diabetic retinopathy, glaucoma, and refractive services and low vision are of major importance in others. There are a few countries with significant levels of trachoma, and they are involved with the Global Eradication of Trachoma by 2020 initiative. Emphasis has been placed on development of midlevel ophthalmic workers. The course developed at Korat, Thailand, for such workers has had a great deal of influence on programs throughout the region.

The Western Pacific region has been fortunate to have the support of a number of international NGOs including Christoffel Blindenmission; the Fred Hollows Foundation, Sydney, Australia; the International Centre for Eyecare Education; and Helen Keller International, New York, NY. Recently, the NGOs working in Australia have formed VISION 2020/Australia to foster a collaborative approach to blindness prevention in the Pacific subregion. A model that has already been duplicated in other parts of the world. Priorities for the coming years include:

- Furthering of cooperation and coordination on the part of NGOs working in the region.
- Improvement in cataract surgical rates in those countries with significant cataract backlog.
- Development of a cadre of midlevel eye health personnel to assist the ophthalmologists with eye care programs.

**COST EFFECTIVENESS OF VISION 2020**

Frick and Foster calculate that successful completion of VISION 2020 will lead to the prevention of 429 million blind person–years. (This is defined as 1 year of blindness for an individual.) This will have a dramatic effect on the lives of millions of people, those with blindness as well as their caregivers. Using conservative assumptions, they estimate that there would be $102 billion of economic gain if VISION 2020 is successful. The costs of many of the interventions that form the VISION 2020 initiative are relatively modest, particularly for public health interventions (such as the distribution of vitamin A capsules and ivermectin for onchocerciasis).11

**GLOBAL COMMITMENT**

Since its launch by Gro Brundtland, MD, director general of the WHO in 1999, VISION 2020 has received the endorsement of all of the supranational ophthalmic societies as well as many of the national organizations. Resources have come from sources as diverse as the state of Andra Pradesh in India, to the private sector of the pharmaceutical industry (Merck, Whitehouse Station, NJ, and Pfizer, New York, NY), to major foundations like the Bill and Melinda Gates Foundation, Seattle, Wash; the Conrad N. Hilton Foundation, Reno, Nev; and the Edna McConnell Clark Foundation, New York, NY, and the work of many NGOs. However, new sources of support will be needed to complete the mission of VISION 2020. Critical to this success will be the commitment of individual ophthalmologists on all continents. Those living in developing nations have given freely of their time to serve the poor in their midst. Brazil has seen national mobilization days, when thousands of ophthalmologists have worked voluntarily to treat their countrymen. Examples like this are frequent. But there is also a role for ophthalmologists in the economically developed world.

VISION 2020 is a global initiative. Every nation has underserved people who require assistance. Oph-
thalmologists, who are motivated to respond to the call of VISION 2020, do not have to look far to see opportunities to be of assistance. They can become advocates with governments in their own countries to increase support for blindness prevention programs. They can reach out to the underserved in their communities or can travel to areas that need their help. Every ophthalmologist can take part in what will be the largest ophthalmic undertaking ever attempted.

RESOLUTION OF THE WORLD HEALTH ASSEMBLY

Each year, the WHO World Health Assembly gathers to determine health policy issues. Last year, at the 56th World Health Assembly, a resolution was adopted, which calls on all member states to commit themselves to VISION 2020 by setting up national VISION 2020 plans by 2005. Further, member states are to establish national coordinating committees, which are to implement the national plans by 2007. The resolution also supports the mobilization of resources to achieve a successful program. This is an extraordinary show of support for the program. It demonstrates the success that advocacy efforts have had to raise the visibility of blindness prevention. Now we must deliver on the challenge.

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