New WHO preliminary estimates released after publication indicate that visual impairment prevalence has been reduced from 314 million people in 2004, to 285.3 million today. Of these, 39.8 million people are estimated to be blind worldwide.
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List of abbreviations

APOC – African Programme for Onchocerciasis Control
AUD – Australian Dollar
GET 2020 – Global Elimination of Trachoma by the year 2020 (WHO programme)
IAPB – International Agency for the Prevention of Blindness
ICEE – International Centre for Eyecare Education
ICEH – International Centre for Eye Health (London School of Hygiene & Tropical Medicine)
INGO/INGDO – international non-governmental (development) organisation
NGO/NGDO – non-governmental (development) organisation
OEPA – Organisation for the Elimination of Onchocerciasis for the Americas
UN – United Nations
USD – US Dollar
WHA – World Health Assembly (governing body of WHO)
WHO – World Health Organization (UN specialist agency for health)

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Introduction

Working together to eliminate avoidable blindness

The facts present us with a dilemma: an estimated 47 million people are blind or vision impaired, yet thanks to decades of research and the efforts of health care workers worldwide, the causes of over 80% of blindness are now avoidable by known and cost-effective means. That means that most people who lose their sight today, do so needlessly.

2010 marks a mid-point in the VISION 2020: The Right to Sight global initiative, which was launched by IAPB and WHO in 1999 with the twin aims of eliminating the main causes of avoidable blindness, and stopping the projected doubling of blind people by the year 2020.

IAPB is tasked with leading a unique collaboration which brings together partners from many sectors. The global initiative leverages the capacity of development agencies, non-governmental organisations, and private sector foundations and corporations, with the very top people and organisations in the eye health professions. Through membership of IAPB, these organisations are teamed with the expertise of the World Health Organization, providing guidance and support for programmes and planning, especially in developing countries.

The structure and direction of VISION 2020 are determined by its underlying principles. Such concepts as partnership, sustainability, and integration of eye care with primary health systems are explored in the second section of this report.

Above all, IAPB is devoted to advocacy for eye health, and the third section of this report examines some examples from different parts of the world, where the VISION 2020 concept has been successfully conveyed to governments, giving rise to effective collaborations in the field, as well as substantial financial commitments.

Disease control is the most tangible of the VISION 2020 ‘pillars’. This section includes expert perspectives, current thinking, and latest research in each of the key areas of avoidable blindness with which the initiative is now concerned. Despite the cost-effectiveness and availability of treatment, cataract remains the greatest cause of blindness, although the picture could be expected to be far worse considering the world’s rapidly ageing populations. Meanwhile, uncorrected refractive error has only recently been recognised as the most significant cause of vision impairment worldwide. Progress against infectious diseases such as trachoma and onchocerciasis, and although laudable, is balanced by the inexorable rise of chronic conditions such as glaucoma and age related macular degeneration.

Much has been learned since 1999, but there is no basis for complacency. The members of IAPB and their many partners in public, private and non-profit sectors are committed to continuing their collaborative efforts, to end avoidable blindness, and bring the Right to Sight to people around the world.

C.G. Garms
President and Chair
IAPB Board of Trustees
Young Child with bilateral cataracts
Global facts about blindness and visual impairment

The VISION 2020: The Right to Sight initiative was launched in 1999 on the basis of WHO estimates that there were 38 million blind people worldwide and 110 million with low vision, and that the number of blind people worldwide was increasing by one to two million per year. Most importantly, it was estimated that at least two-thirds of all blindness was avoidable (treatable or preventable) and that extremely cost-effective interventions were available to prevent or cure blindness – such as cataract surgery (‘as cost-effective as immunisation’), the distribution of vitamin A, surgical and non-surgical trachoma interventions, or the economically advantageous onchocerciasis control programmes. In short, ‘there was every reason to consider blindness prevention as one of the most worthwhile public health and developmental interventions that could be undertaken.’

We have now reached the halfway point in the 20 years allotted to reach the goal of VISION 2020, the global elimination of avoidable blindness. Since the early days of the initiative, more data have emerged and the definitions of blindness and visual impairment now refer to ‘presenting visual acuity’ rather than ‘best corrected visual acuity’. These new definitions will be incorporated in the 11th revision of the International Classification of Diseases which will be submitted to the World Health Assembly in 2014.

A more precise picture has emerged of the proportion of causes and their distribution per region and, for the first time, data is available on visual impairment due to uncorrected refractive error (defined as visual acuity of less than 6/18 in the better eye that could be improved to equal to or better than 6/18 by refraction or pinhole) – though this does not include presbyopia.

The latest available global data are based on 2002 (for causes excluding uncorrected refractive error) and 2004 estimates (for uncorrected refractive error). No comprehensive disease-specific and region-specific data have been released since these estimates were published. The combined 2002 and 2004 data are presented in Figure 1. Globally, about 314 million people are visually impaired, amongst whom 45 million are blind. The leading causes of blindness worldwide are cataract (which accounts for 39% of cases), uncorrected refractive error (18%), glaucoma (10%) and age-related macular degeneration (7%). Up to 80% of blindness and up to 85% of moderate or severe visual impairment is avoidable by prevention, treatment or cure.

Figure 1: Global causes of blindness due to eye diseases and uncorrected refractive errors

- Caract 39%
- Uncorrected refractive errors 18%
- Glaucoma 10%
- ARMD 7%
- Comical scar 4.3%
- Diabetic retinopathy 4%
- Childhood blindness 3%
- Trachoma 3%
- Onchocerciasis 0.7%
- Other 11%
Globally, 85% of visual impairment is avoidable.

Visual impairment is unequally distributed worldwide: about 87% of visually impaired persons live in developing countries, 82% of all people who are visually impaired are age 50 and older (although they represent only 19% of the world’s population), and women are significantly more likely to be visually impaired than men, in all regions of the world and at all ages.

Although collecting an evidence base on the effectiveness of the VISION 2020 initiative has proven challenging, the present document offers a picture of the progress made in controlling avoidable blindness over the past ten years. The different sections, written by experts from a variety of regions, as well as the case studies, offer the authors’ assessments of the work done and the work to come.

References
1. It was noted that these figures, based on the 1990 global population, would rise to 45 million and 150 million, respectively, if extrapolated to the global population in 1996. WHO. Global initiative for the elimination of avoidable blindness. WHO/PBL/97.61. Geneva: WHO, 1997.
VISION 2020: The right to sight

Peter Ackland

The start of VISION 2020

Formal links between IAPB, the eye care INGOs and WHO existed long before VISION 2020 was launched. In addition to these individual arrangements, meetings such as that of the Consultative Group and the Partnership Committee also provided a forum for WHO to interact with the INGOs. These were essentially opportunities to exchange information; valuable as they were, they did not however provide significant financial support to joint activities with WHO.

In recognition of this, in 1994 two of the leading INGOs formed the Task Force for Prevention of Blindness, which was later established as Task Force of IAPB, in order to provide financial support for priority activities which WHO wished to undertake. Very soon, other INGOs joined the Task Force and yet others were invited to participate in supporting individual projects. It was within this group that the idea of an overall global initiative was first discussed.

The Task Force agreed to fund a major WHO consultation process among eye care experts. This consultation laid the foundations for a global initiative for the elimination of avoidable blindness, which was subsequently branded as ‘VISION 2020: The Right to Sight’. This global initiative would also provide a context for assessing the various project ideas that WHO wanted to fund and it would facilitate the expansion and integration into a common framework of other recently developed joint initiatives with WHO, such as APOC and GET 2020.

The Task Force and WHO entered into a formal agreement to oversee the development of VISION 2020 and the initiative was officially launched in 1999 by the Director General of WHO. In 2000 the Task Force was integrated into IAPB and since 2005 VISION 2020 is a joint programme of WHO and IAPB based on an ‘Agreement for Collaboration on the Prevention of Blindness’ signed by both parties.

The structure of VISION 2020

At the heart of the VISION 2020 global initiative lies the partnership agreement between WHO and IAPB.

WHO works with the ministries of health of its Member States. Within WHO, the Prevention of Blindness and Deafness Unit in Geneva leads in matters concerning VISION 2020. Four of the six WHO regional offices have also established posts that focus upon promoting VISION 2020. The Action Plan for the Prevention of Avoidable Blindness and Visual Impairment, adopted by the World Health Assembly in 2009 (see page 41), is the most recent document to articulate the important role that WHO plays within VISION 2020.
IAPB is an umbrella INGO body which represents the interests of its 111 members. These members comprise all the leading eye health INGOs, as well as national NGOs and several academic institutions. Other important members include the leading organisations representing the ophthalmology and optometry professions and a number of private commercial companies. IAPB’s executive staff are based in its headquarters in London; small regional offices are located in Africa, Latin America, Eastern Mediterranean and Western Pacific regions.

Collectively, IAPB members deliver more than 1,500 eye health programmes in coordination with more than 1,000 local partners in over 100 countries. The Trustees of IAPB and representatives from WHO meet twice a year to provide strategic leadership to the VISION 2020 global initiative.

No matter how effective collaboration becomes on a global level, the success of VISION 2020 will ultimately depend on the efforts of people involved at national level and provincial or district levels. For this reason, VISION 2020 promotes and supports the establishment of VISION 2020/prevention of blindness committees at country and district levels. These bodies make plans based upon local priorities, but using the tried and tested service delivery models that have been promoted and developed by VISION 2020 over the past ten years.

**Successes and challenges**

The two recent WHA resolutions promoting VISION 2020; the Action Plan; the fact that VISION 2020 planning workshops have been held in 151 countries and that there are more than 118 countries with a national committee and some 104 national VISION 2020 plans have all contributed to the progress of VISION 2020.

The biggest challenge facing VISION 2020 is the implementation of all these plans. The cost of blindness and visual impairment to the global economy is enormous (see page 32). Only a fraction of that cost is required to implement VISION 2020 and achieve the elimination of avoidable blindness by the year 2020. Somehow, we have to persuade those who control finance in the development sector that they must invest in VISION 2020.
Penya Optical at the Queen Elizabeth Central Hospital, Blantyre, Malawi, was established by the International Eye Foundation whose decade-long focus on sustainability programming emphasises the double benefit of an optical service within an ophthalmology clinic. Patients choose from a range of frames, lenses and pricing, while optical services with a qualified optometrist, a lab, and technicians making new spectacles to prescription help address millions of people visually impaired due to uncorrected refractive error. Optical services pay for themselves within a year and profit supports growth and provides unrestricted funding for the ophthalmology clinic.

Fundamental concepts

The principles guiding IAPB
Partnership – at the heart of VISION 2020

Peter Ackland

The values associated with partnership lie at the very heart of VISION 2020 and it is through partnerships that much of the success of VISION 2020 has been achieved to date. The World Health Organization (WHO) recognises this and, as a consequence, one of the five objectives included in the Action Plan for the Prevention of Avoidable Blindness and Visual Impairment1 adopted by the World Health Assembly in May 2009 (see page 41) focuses specifically on partnership:

“Improve coordination between partnerships and stakeholders at national and international levels for the prevention of blindness and visual impairment.”

Two of the actions outlined by the Action Plan in support of the above objective are ‘promoting partnerships between the public, private and voluntary sectors at national and sub-national levels’ and ‘liaising with other international organisations and agencies with broader development agendas in order to identify opportunities for collaboration’. While VISION 2020 has been very successful in achieving the former, it now needs to forge alliances with other development agencies.

Promoting partnerships between the public, private, and voluntary sectors at national and sub-national levels

The partnership that both established and continues to drive the VISION 2020: The Right to Sight global initiative is that between WHO and IAPB (see page 6). VISION 2020 would not exist without the unique contribution made by these two agencies.

Case study: Lions brings improved eye care to Armenia

The Lions Regional Ophthalmic Unit, located in Sevan City, provides eye care services to a previously underserved area in one of the poorest provinces of Armenia. In this former Soviet Republic, out of a total population of three million, 26.5% live below the poverty line. The government allocates only about 1.5% of the gross domestic product to health and the country has one of the highest reported rates of out-of-pocket health expenditures in the region (65.5% in 2003).

The Unit is the result of a partnership between the Lions Club International Foundation’s SightFirst programme, the American University of Armenia and the Ministry of Health of Armenia. This partnership has benefited not only the 26,750 residents of Sevan City, but also people in the whole province and all neighbouring provinces, who travel to the clinic or are screened through numerous outreach programmes. Since it was launched in June 2005, the clinic has served more than 17,300 people and performed over 980 operations.
IAPB was originally founded by two organisations – the World Blind Union (WBU) and the International Council of Ophthalmology (ICO) – and both play an important role in VISION 2020. The WBU ensures that the interests of blind and visually impaired persons are paramount in VISION 2020 strategies. ICO has particularly focused on human resource development – one of the major pillars of the VISION 2020 approach. The World Council of Optometry is the other major professional body involved in VISION 2020. It has been influential in raising awareness of the extent of uncorrected refractive error and of just how important optometry is to the success of VISION 2020.

At country level, VISION 2020 is most often driven by a National Prevention of Blindness Committee (NPBC) – or its equivalent. This committee is normally formally constituted by the ministry of health and in some countries a National Prevention of Blindness Coordinator will be employed to oversee eye health activities. Members of the committee invariably include ministry policy makers, eye health professionals, representatives of the INGOs working in that country and, in some enlightened committees, representatives of corporate supporters of eye health programmes. Pakistan and India are two examples of countries where the collaboration between government and both indigenous and international NGOs has changed the face of eye care at national level (see pages 43–46). Many of the approaches coming out of the Indian success are now the inspiration for eye health programmes around the world.

The support of the INGOs for VISION 2020 has been a critical factor in determining success to date. An IAPB survey\(^2\) of its members in 2008 indicated that IAPB members collectively deliver more than 1,500 eye health programmes in coordination with more than a 1,000 local partners in over 100 countries. The INGOs contribute USD 350 million per year between them to support eye health activities.

**Case study: ‘Seeing is believing’ improves the lives of people with diabetes in China**

More than 84,600 people have received information on diabetes and diabetic retinopathy through individual consultations or small group discussions, as part of a dynamic partnership between The Fred Hollows Foundation and the Aier Hospital Group. This project started in 2008 and is being supported by the Standard Chartered Bank’s ‘Seeing is Believing’ initiative.

Diabetic retinopathy is a widespread but preventable eye disease which, if untreated, can cause blindness. It is estimated that more than 75% of patients who have had diabetes for over 20 years will have some sort of retinopathy. A recent report suggests that there are now more than 92 million adults with diabetes in China and that nearly 150 million more are well on their way to developing it.

When one considers that nearly 90% of diabetes-related blindness can be prevented if the correct medical and eye care is received in time, the potential impact of interventional programmes is considerable. ‘Seeing is Believing’ has established a transferable model for the diagnosis and treatment of diabetes-related eye diseases. This model works through primary health care workers, established screening units in communities, treatment centres in major cities, as well as mass media and education campaigns.
Successful partnerships, and especially those between the public, private and non-profit sectors have made a notable contribution to eliminating avoidable blindness. Two major successes to date have been the significant reduction in the prevalence of blinding onchocerciasis and trachoma. This would not have been possible without the generous and long-term support of Merck & Co, Inc. and Pfizer, Inc. These two pharmaceutical companies have donated the drugs Mectizan® and Zithromax®, respectively, to enable the mass treatment of infected communities. Another example of support from the private sector is the Standard Chartered Bank’s ‘Seeing is Believing’ programme. This partnership between the Bank, IAPB, and implementing INGOs is unique in that the Bank’s commitment to VISION 2020 has become institutionalised within its operations, despite the fact that eye health is quite far removed from the Bank’s core business.

Liaising with other international organisations and agencies with broader development agendas

A wide variety of partnerships have made important contributions to VISION 2020 and many more will hopefully be forged in future years. However, most of the existing partnerships remain within the world of eye care. Although VISION 2020 is now reasonably well known within this circle, it is less well known in the wider health and development sectors.

It is arguable that, in order to achieve our ambition of eliminating avoidable blindness, we will need to compete more effectively for limited health development finance. This will require raising the profile of VISION 2020 and forging new partnerships with agencies outside the professional eye world. The importance of this is recognised in the Action Plan and establishing these new partnerships is high on the current IAPB agenda.

Case study: ‘MalTra Week’ – treating malaria and trachoma in Ethiopia

An ambitious public health campaign using an integrated approach to combat malaria and trachoma in Ethiopia recently reached a new milestone. In the largest single effort to combat preventable blindness, NGO and government partners successfully completed a third ‘MalTra Week’ in November 2009. The week-long campaign, which combined treatment for malaria and trachoma (MalTra) as well as prevention education for these diseases, reached millions of residents of Ethiopia’s Amhara region. This inspiring effort was spearheaded by the Amhara National Regional State and the Lions Clubs-Carter Center Sightfirst Initiative.

The International Trachoma Initiative participated as a partner by securing the delivery of USD 180 million’s worth of the antibiotic Zithromax®, donated by Pfizer, Inc. for the treatment of trachoma. During this MalTra Week, 8.4 million residents of the region received treatment. Two previous MalTra Weeks had treated a combined total of over 9.47 million people. The dramatic increase in this most recent effort was due to a massive mobilisation of more than 17,000 health workers and volunteers across the region. Their work was accompanied by trachoma prevention and control health education messages broadcast over the radio, in schools, and on a mobile video van. The collaboration of all partners in this model public health campaign was an inspiration to all.
In the public sector, attempts will be made to establish relationships with other UN bodies and the large multilateral and bilateral development agencies. Other obvious targets for new partnerships are INGOs involved in broader development issues around health, ageing, and water and sanitation. There is also undoubted scope to increase private sector interest in VISION 2020.

In conclusion, it is fair to say that partnership is a much over-used word in the development industry. However, there can be few global development programmes that can point to more successful relationships and long-term collaborations and partnerships than VISION 2020. The knowledge and experience we have gained over the years will be an important card to play as we seek to engage a wider pool of partners in going forward.

**Case study: Partnership in Ghana – the Refractive Error Study in Children**

One of the major challenges in the control of uncorrected refractive error, especially in Africa, is the absence of reliable data and of government budget allocations to eye or vision research. Limited financial resources are utilised to combat malaria, HIV/AIDS and other epidemic diseases, and eye research is not a priority. Collaborations committed to high-quality eye care and vision needs can create opportunities to fill the gap and harness the strengths of each partner.

The Refractive Error Study in Children (RESC) conducted in Ghana recently demonstrates the benefits of such collaborations. A total of 2,455 children were examined. The study assessed refractive error and the principal causes of visual impairment in school-going children: refractive error was the major cause of visual impairment in children aged 12 to 15, at 75% both eyes, followed by amblyopia and corneal opacities, at 10% and 5% respectively. Other outcomes included provision of corrective spectacles and identification of associated risk factors for refractive error in children.

In this partnership the World Council of Optometry (WCO) provided funding, Kwame Nkrumah University of Science and Technology (KNUST) in Ghana provided the study team, and the International Centre for Eyecare Education (ICEE) trained the 14-member team and supervised the entire process, ensuring that the protocol was strictly adhered to. The team included two ophthalmologists, six optometrists and five school-leavers. The skills acquired, especially by school-leavers, included visual acuity testing, eye drop application, enumeration of schools, cluster identification, and clerking.

This collaborative effort not only met the research needs of the population and provided baseline statistics for planning, but it also saw a transfer of skills to the local community, thus strengthening research capacity, creating opportunities for service development and a favourable platform for future collaborations. The resulting relationship facilitated the establishment in May 2010 of the Ashanti Vision Centre in the community.
Case study: The Mectizan Donation Program
Before the Mectizan Donation Program and its partners began distributing ivermectin (Mectizan®) for onchocerciasis, there were an estimated 300,000 blind and 1,000,000 with visual impairment. This is a thing of the past! Studies in Latin America have shown that new cases of blindness due to onchocerciasis are no longer being reported and ocular morbidity has almost disappeared. In Africa, new cases of blindness are increasingly rare.

This dramatic change since the beginning of VISION 2020 is due to the continued scaling up of the Mectizan Donation Program and the successful partnerships that the donation has stimulated. The major partnerships in the Americas (OEPA) and Africa (APOC) involve ministries of health, WHO, and NGOs. The Americas plan to eliminate the disease by 2012. In Africa, where it was thought that onchocerciasis could not be eliminated, studies show that the disease has been eliminated in parts of West Africa and the situation is looking very promising for other areas after 14–16 years of treatment. Strategies are underway to ‘shrink the map of onchocerciasis’ in Africa, with a goal to potentially eliminate the disease from East and West Africa by 2020. In Central Africa, however, this goal is more complicated. Therefore, until transmission has been interrupted in all endemic countries, support for ivermectin distribution must continue to ensure that the success already made is not lost to a resurgence of the disease.

Approved Mectizan® treatments by year

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2. IAPB. IAPB Added Value Survey 2008. Conducted by the International Centre for Eyecare Education.
Human resources for eye health in developing countries

Paul Courtright

Introduction

Achieving the goals of VISION 2020 requires a well-trained, motivated, and supervised workforce; without adequate personnel in place, prevention of blindness or sight restoration cannot take place. The situation facing us ten years ago was not encouraging: there were inadequate numbers of clinical eye care providers, an almost nonexistent management cadre, disjointed efforts at training, little consideration of the need for a team approach to eye care, and minimal interaction between training programmes. These problems stemmed from inadequate coordination between countries, academic institutions and NGOs, inadequate information on projected eye care needs, and inadequate long-term planning.

In the last ten years much has been learned. The assumption that eye care needs (and associated human resource needs) in all developing countries would be the same has been discarded, and more realistic estimates of needs have started to emerge. For example, we now understand that the epidemiology of cataract and refractive error varies from region to region; this has required a re-assessment of the human resources needed. In South Asia, for example, the recommended target for 2020 of ophthalmologists to population stands at 1 per 50,000 people, while in Africa the target is 1 per 250,000.¹

Understanding the wide range of eye care needs in the community (from simple ‘reading glasses’ and foreign body removal to retinal surgery) is also helping to identify the appropriate role of mid-level eye personnel; in particular how such personnel can be key members of the overall ‘VISION 2020 eye care team’.

¹ The Senior Ophthalmic Nurse at Mamfe District Hospital, supported among others by IAPB member Sightsavers, undertook six months’ intensive training in Mamfe before training further in the Gambia in 2004 for 1½ years.
Some successes of the past ten years

New innovative approaches to training human resources

One example is the multiple-entry, multiple-exit model for training in refraction and optometry developed by the International Centre for Eyecare Education (ICCEE), which is being promoted in South Africa, East Africa, South Asia, and the Caribbean. An example of collaborative capacity-building initiatives is Seva Foundation’s network of Centres for Community Ophthalmology (CCO) in Latin America (Visualiza in Guatemala), in Africa (KCCO in Tanzania, Al Noor Magrabi in Egypt) and in Asia. The CCO network has helped to strengthen skills in mentorship, planning, and evaluation among the member centres. Al Noor Magrabi has also worked with non-eye care organisations on how to address eye care needs in the region.

Increasing the number and the skills of ophthalmologists

Globally, considerable success has been achieved in increasing the number of ophthalmologists in training, as well as the skills that they possess upon graduation. These successes have come about because of concerted efforts to strengthen training programmes and professional bodies (including regional ophthalmology societies in many countries), to ensure that scholarships are available, and to improve coordination among NGOs and training institutions.

In addition, sub-specialty training programmes have mushroomed worldwide; this has led to a greater ability of ophthalmologists to manage more specialised conditions such as paediatric cataract, diabetic retinopathy, and glaucoma. The growing cadre of well-trained paediatric ophthalmologists and retinal surgeons means that more children are now receiving high-quality eye care and that retinal problems that used to be considered ‘hopeless’ are increasingly being treated.

Recognising the importance of all personnel in the eye care team

VISION 2020’s focus on planning eye care needs at the ‘district’ level (population of about one million) led to a shift in how we think about human resources for eye care; the days of just training a clinician or nurse and ‘parachuting’ him or her into a clinic or hospital without support are waning. Planning now entails consideration of the entire team needed to provide eye care: ophthalmologist, ophthalmic nurse, optometrist or refractionist, manager, counsellor, etc. Recognition of the importance of the team has led to the establishment of a number of new training programmes: refractionist training in Africa, management training in Asia, Africa, and Latin America, and new ophthalmology residency and sub-specialist training programmes in many developing countries around the globe. In all of these cases, the expansion of internet service and cell phone coverage throughout developing countries has increased the capacity of eye care staff to communicate with one another, gain new skills, and seek out new training opportunities.

Addressing current and future needs in human resources

There continue to be many challenges which will need to be addressed in the next ten years.

Global shortage of health workers

The global shortage of health workers is one of the biggest challenges. The 2006 World Health Report estimated the shortage of health workers at 4.3 million globally – and at 1.3 million in Africa alone – and a 2008 report by the Global Health Workforce Alliance called for a rapid scaling up of the education and training of health workers. Although estimates of eye care worker shortfall have not been calculated, they are likely to be significant. It is important to ensure that international development efforts to strengthen the global health workforce take into account the need for eye care teams. These gaps are not universal; areas of need include Francophone and Lusophone Africa and China.
Supervising and supporting staff after training

It is increasingly being recognised that, by itself, training more eye health staff will not achieve VISION 2020 goals. Research has illustrated the importance, particularly among mid-level eye health personnel, of management systems for supervision and support in order to achieve reasonable levels of productivity and efficiency. Wasting our valuable human resources through ill-focused training, poor planning, and absence of supervision after training benefits no one. The importance of ensuring that existing eye care staff are used efficiently has been the focus of much work over the past ten years and this will likely continue for some time to come. Expanding the evidence base continues to help us decide how, and in what fashion, we can best ‘scale up’ training programmes for mid-level eye personnel.

Addressing the global epidemic of diabetes

The number of people with diabetes is increasing worldwide, even in remote Asian and African villages. It will be essential to develop innovative models for addressing diabetic retinopathy. Training programmes will need to adapt to reflect these needs.

Training comprehensive child eye health teams

There remain many gaps in the provision of high-quality eye care services to children and most child eye health tertiary facilities still do not have the full complement of staff (low vision technicians, childhood blindness coordinators, and paediatric anaesthetists) needed to ensure good final outcomes after surgery.

Meeting the ongoing need for cataract surgery

Cataract will remain a challenge for VISION 2020 over the next ten years, which means that a primary responsibility of ophthalmologists will remain cataract surgery. Improving both efficiency and quality still needs to be a priority. In settings where non-physician ‘cataract surgery providers’ work, the challenge is determining the expected number required, the expected scope of their work, how they fit into the VISION 2020 team, and how they can be adequately supervised and supported.

Conclusion

Over the next ten years, we shall need to ensure that eye health human resources are appropriately selected, trained, supported, and mentored. The global eye care work force must grow by gaining new skills, working better as a team, having better management practices in place, and having the motivation to meet the eye care needs of the population. An efficient, high-quality and dedicated eye care team will benefit all of those people – whether living in rural Peru, on the Tibetan plateau, or on the coast of Angola – who currently need or will need eye care services.

References

Infrastructure and technology for eye health in developing countries

Ingrid Mason

Without equipment, tools, consumables and physical structures to support eye work, the goals of VISION 2020 would be difficult to achieve. The VISION 2020 initiative has therefore made ‘Infrastructure and Technology’ one of its three pillars.

Since the launch of the initiative, progress in the area of technology has been noticeable and the existence of VISION 2020 has furthered the case for appropriate technology on a global scale. Infrastructure coverage has improved, though many regions are still without access to eye care services; however, data on infrastructure remains somewhat difficult to obtain.

Early milestones in developing appropriate, sustainable technology

It has long been recognised that both technology and infrastructure need to be appropriate for each setting, affordable and sustainable. In the mid-1980s, health care systems in many African countries were not addressing the causes of blindness, focusing instead on AIDS and the affiliated diseases, which meant that eye care still remained very dependent on the NGO sector. NGOs such as CBM and Sightsavers in Eastern and Central Africa began to support the development of locally manufactured, and therefore cheaper, medicines and spectacles. Particularly good examples can still be found today in Tanzania, Kenya and Cameroon. In another endeavour to reduce cost while maintaining quality, a series of trainings were organised in Kenya and Uganda by Jan Worst to encourage eye units to manufacture their own sutures using 30G needles and silk thread.

India and South-East Asia were already developing with their respective governments their own independent sustainable strategies to deal with the backlog of cataract.

Aurolab was established in India with support from a consortium of eye care providers. Its main focus was the production, for developing countries, of quality and affordable anterior and posterior intraocular lenses (IOLs) and supporting visco-elastic and sutures. This substantially decreased the cost of cataract surgery in India and Africa, making it more affordable in these and other countries.

The first training courses for instrument technicians were set up in India by Aravind Eye Care System. Aravind recognised that to ensure the long-term functioning of equipment – and hence safeguard quality outcomes and outputs in both the operating theatre and the outpatient department – it was essential to train technicians to maintain and repair the equipment commonly used in a district eye unit. Instrument maintenance courses run by the Lions Aravind Institute of Community Ophthalmology have now trained technicians from more than 30 developing countries.
Some successes of the past ten years

VISION 2020’s commitment to appropriate, affordable technology and well-designed working spaces has manifested itself in many ways, including:

- **Eye care has been defined beyond the specialist ophthalmologist level** to all levels of health care, hence the predominant use of ‘affordable’ through all VISION 2020 practices.

- **The creation of IAPB’s Technology Committee**: this diverse group of skilled field-based personnel can give expert advice on specific aspects of eye care, e.g. optometry, low vision devices, surgical needs, paediatric requirements, etc. Communication between this committee and others has helped to ensure better practice.

- **The Standard List for District Eye Care programmes**: IAPB’s Standard List\(^2\) is a guide to products, suppliers and prices for a district eye unit in a developing country. The List was developed in collaboration with two major eye care NGOs (CBM and Sightsavers). Each product has been field-tested in a developing country and can be supported through on-ground assistance or in-service training. The List can help units ensure that quality products, supplied by quality manufacturers, are purchased. Knowledge of the approximate quantities required globally and for a given period for CBM and Sightsavers projects has been used as leverage to gain better prices from manufacturers.

- **Using research and evidence, the Technology Committee produces guidelines**, which are approved by IAPB’s Board of Trustees. Some recent topics include the local production of eye drugs, the use of recycled spectacles, and ethical employment practices.

- **The involvement of corporate agencies into supporting and working with VISION 2020** to ensure that equipment and consumables are appropriate to a developing country context. Successful examples to date include the anterior portable vitrectomy machine designed and tested by end-users in developing countries and produced by Geuder (Geuder Vitron 2020), quality optical teaching magnifying loupes and microscope attachments by Zeiss, and a wide variety of IOLs and supporting pharmaceuticals and sutures for cataract and glaucoma surgery.
● Highlighting eye care needs to manufacturers and NGOs through VISION 2020: for example, VISION 2020 firmly placed refractive error and low vision onto the eye care map. Accordingly, suppliers began to produce devices and spectacles that matched the need and paying ability of clients. The Hong Kong Low Vision Resource Centre, which provides affordable low vision devices and is managed by the Hong Kong Society for the Blind, is a very good example of how a consortium of NGOs worked together to address the need for quality affordable low vision devices.

● Working with manufacturers to translate equipment manuals: the translation of key equipment manuals and textbooks for French- and Portuguese-speaking African countries remains a constant and urgent need. Considerable assistance to fill this void has been given by Scanoptics and Zeiss in the translation of their equipment manuals into these languages. Such good cooperation between these manufacturers and IAPB’s Technology Committee significantly improves the maintenance and required repairs for equipments in countries where there may not be available a designated technician from these companies.

The challenges ahead
● Development of infrastructure has been well addressed in India but remains a challenge for many district and tertiary level eye units. Eye units frequently need to compete with other health care services for operating room days, beds and outpatient space. Unfortunately, eye care is often seen as a specialty that does not require special conditions. This can result in substandard design of operating theatres, compromising patient safety and outcomes from surgery. Further work needs to be done through the Technology Committee to develop guidelines for better practice that will assist in the refurbishment of older units and the development of new ones.

● WHO’s Essential Medicines List needs to be revised to incorporate essential eye pharmaceuticals. This will help reduce importation charges, which will in turn reduce costs to eye units.

● There is a need to lobby governments about the benefits of using the IAPB Standard List over current procurement practices. This will harmonise equipment procurement, increase efficiency of supplies and build a firm base for equipment support in each country.

● The basic principles of equipment maintenance need to be incorporated into all eye care training curricula.

● Suppliers and manufacturers need to be made aware of the Technology Committee’s expertise on the design and appropriateness of equipment.

● Key manufacturers must be encouraged to train local technicians for their equipment and to establish focal points for consumables and spare parts. This will increase the sustainability and autonomy of eye units and reduce delays often associated with importation and reliance on an international market.

● Eye units will in the future be able to purchase what they need directly through an online web-based ‘shopping basket’ system. This technology will allow the purchaser to view the item by linking into the suppliers’ and manufacturers’ websites. The improved efficiency of this system has great potential in developing the capacity of eye units through their direct interaction with manufacturers.

References
1. To support training and increase awareness on the general importance of maintaining equipment, Aravind published in 2006, a training manual and CD: Professor V Srinivisan and Dr RD Thulasiraj, Ophthalmic instruments and equipment – their care and maintenance. It is still available today through Teaching Aids at Low Cost (TALC): www.talcuk.org
2. The list can be downloaded at www.vision2020.org/standardlist
Primary eye care

Daniel Etya’ale

Introduction

In 1978, a conference organised in Alma-Ata, Kazakhstan, put forward the concept of primary health care (PHC), based on the principles of universal access to health, equity, social justice, and community participation in health programmes. It was a ground-breaking change to focus on service delivery at community level, when most efforts and resources at the time were focused on hospital care in major cities. Primary eye care (PEC) is the extension of PHC principles in the area of eye care.

Thirty years on, while PEC remains a popular concept amongst public health experts, it has yet to be implemented on a national scale in the countries that need it most. The main reason for this gap between theory and practice is that, contrary to what one might think, there is no consensus on what constitutes ‘primary eye care’ and therefore on the services that should be put in place.

Indeed, for some, PEC is first and foremost an elegant concept promoting a more inclusive and comprehensive approach to eye care: promotion, prevention, early detection, treatment, and rehabilitation. For others, probably the most numerous, PEC represents above all the first level in the eye care system, i.e. the community level (the ‘missing link’ at the periphery of the health system). For others still, PEC describes the basic package of eye care interventions that should be put in place whenever eye care services are nonexistent or not yet operational.

In truth, these three approaches to PEC are far from being mutually exclusive; they reflect the reality of service provision, which varies widely within a same country and even more so between countries.

It is therefore important, before the implementation stage, to clearly define which PEC activities should be put in place and to ensure that services are appropriate to each local setting. For example, it would be futile, indeed harmful, to train community-level personnel in basic PEC in a district where there is no specialised personnel to supervise them and no eye care facility for patients to be referred to. Health planners should take into account the following points before designing and implementing a PEC programme:

Inventory of eye care services

A situation analysis will assess in particular:

- the level of decentralisation in the health system: a decentralised system will facilitate integration and ownership of PEC services.
- the national coverage and functionality of PHC: if PHC services are not operational, it will be difficult to put in place sustainable and viable PEC services. PEC should first be implemented in areas where PHC services are already in place.
- the presence and distribution within the country of specialised eye care personnel (ophthalmologists, ophthalmic technicians or nurses, etc.).
- whether, and in what manner, existing community health workers can be involved in PEC.
- the most underserved areas, where additional measures may be necessary to set up PEC services.

Strategies for implementing PEC

Considering that service provision varies considerably between countries and between districts or health areas, it is difficult to imagine a ‘one size fits all’ strategy to implement PEC. Once the situation analysis has been completed, a variety of strategies will need to be envisaged. In any given case, the chosen approach(es) must fit the reality of the situation in each country or setting.
For example, in countries with severe shortages of eye care personnel (e.g. in Chad or in the Central African Republic), it is best to proceed with caution, in stages, from the centre (regional or district capital) to the periphery. Personnel at district or provincial level should be trained and equipped first; once this workforce has become fully operational, the next level can be trained, and so on until the community level is ready for training. It would be advisable not to begin by training numerous community eye care workers, who will then rapidly lose all credibility if they are not supervised on a regular basis or if the centres to which they refer patients are located too far away from the community.

In cases where there already exists at least a basic eye care infrastructure throughout the country (e.g. Kenya or Uganda), the priority should be to make the entire system more effective, for example by adding a ‘community level’ to existing eye care levels; by widening the scope of existing eye health activities to include ‘prevention’ and ‘promotion’, which are often overlooked; by improving referral and counter-referral mechanisms between all levels of the health system; and finally by identifying non-ophthalmic personnel who can get involved in PEC, if needed. For example, the Tunisian national diabetic retinopathy programme recycles and trains general practitioners to act as frontline personnel screening for the disease. In Mauritius, this role is fulfilled instead by medical technicians who have been trained in digital retinoscopy.

**Appropriate PEC training programmes**

In order to achieve sustainability, any PEC training programme should be adapted to its setting and contain elements of health promotion, prevention, rehabilitation, and treatment (the importance given to treatment will depend on the personnel being trained). Because most training programmes in PEC are of short duration, it is important that they not simply be ‘mini courses’ in ophthalmology but fulfil instead the following criteria:
● They should focus on a limited number of tasks essential to the student’s future work. For example, instead of listening to a lengthy theoretical lecture on eye examination, students should learn how to suspect refractive error, identify a corneal ulcer or an operable cataract from a basic eye examination. For instance, ‘key informants’ in Bangladesh have been trained to identify ‘children with eye problems’ and refer them to the appropriate level of specialised personnel.

● After completion of the training programme, each student should receive the necessary equipment to perform the tasks for which he or she has just been trained.

● During training, students should be given the list of the nearest frontline centres and specialised centres, where they can refer urgent or serious cases.

● After completion of his or her training, the student should be given a letter for his or her supervisor, detailing the new skills acquired during training. A timeline should also be agreed with each participant for the first supervisory visits in the field.

Who should be involved in PEC?
The answer will depend on the following factors:

● which conditions have the highest prevalence or have been identified as a priority by the national prevention of blindness committee.

● what medical and mid-level health personnel is available in the country.

● which health services and personnel will have the biggest impact if they become involved in PEC.

For example, to prevent causes of avoidable blindness in children, it is important to involve the services which first come in contact with affected or at-risk children. Thus, prevention and even elimination of ophthalmia neonatorum will necessarily involve training midwives and supplying them with antibiotic ointment. The prevention of vitamin A deficiency or of ocular complications following measles will require the involvement of the Expanded Programme on Immunisation (such as in Cameroon, Niger, the Democratic Republic of Congo and 22 other African countries) and the training of personnel working in paediatric or maternal and child health units. Because most of these children come into contact far too late with eye care services, the main role of the ophthalmologist will be to train and supervise the personnel who will be the first point of contact for affected or at-risk children.

Conclusion
PEC will remain a pressing concern as long as there exist entire districts completely devoid of eye personnel, as long as patients present too late with blinding eye conditions which could have been screened for or treated early, and as long as thousands of children – whose lives could have been improved by a simple pair of spectacles – have to leave school early.

PEC is not just important in developing countries. It is an essential level of service delivery in any comprehensive eye care system, as well as an opportunity to promote eye health, manage the most common eye conditions, and hasten the elimination of avoidable blindness.

Recent years have seen a renewal of interest in primary health care. It would therefore be timely to finally bridge the gap between theory and practice, so that the scaling up of PEC becomes the rule rather than the exception.

References

Sustainability

Solvency is not the only factor which can limit the ability of a practice or institution to continue to offer its services over an extended period of time, providing reliable follow-up and continuity of care to its community.

Eye care services must be accepted, trusted and embraced by their communities, or patient numbers will inevitably dwindle. This requires a strong quality management, as well as robust marketing and public relations efforts.

Good staff, at all levels, should be properly rewarded to ensure continuity of care, but appraisal processes must also be rigorous and ongoing. Practitioners must be motivated to increase their own output, but not at the expense of high-quality service. For this reason, the importance of good leadership and management must never be overlooked.

Supply chain management is another factor which can severely limit capacity when neglected. Suppliers must be reliable, but also must be able to rely on the client! Staff must be trained and equipped to maintain equipment in good order, to avoid costly breakages.

Of course, financial cost-recovery is also a crucial factor for the success of any health care programme – and nowhere more than in developing countries, where services must be made available to low-income consumers at low or even no cost. Service models have thus been developed by many IAPB members and others, which address the need to recover costs and maintain eye care services as businesses.

Case study: Success factors for sustainability within the Aravind Eye Care System

The Aravind Eye Care System, in India, has been an inspiration to many interested in establishing eye care services on a large scale, in a sustainable fashion, and ensuring that even the very poorest members of a community receive services.

The critical success factors include*:

● Good management with an emphasis on efficiency and "task shifting" (whereby no one carries out a task that could be competently performed by someone with a lesser qualification and on a lower salary).

● High-quality surgery – with constant monitoring of outcomes.

● A team approach to service delivery.

● A tiered service system that allows free surgery to be offered to those who cannot afford it, subsidising it by wealthier patients who choose to pay for additional services.

● High productivity giving rise to high surgical volumes.

● Partnerships with community organisations, local industries and educational and religious institutions that organise outreach activities and screening.

● Good leadership that places service above personal gain.

Some factors that have contributed to Aravind’s success are certainly specific to India and South-East Asia. Whilst the Aravind model cannot be exported wholesale to Africa, however, many of its principles hold good and much can be learned to help develop sustainable eye health services elsewhere.

Case study: Assessing the sustainability of community-directed treatment with ivermectin

The Africa Programme for Onchocerciasis Control (APOC) has established more than a hundred ‘project areas’ where control activities are being pursued. Given that the distribution of ivermectin (Mectizan®) to infected communities should take place annually and for several years, considerable attention has been placed on the long-term sustainability of these projects. At the heart of the APOC approach is community-directed treatment, where the local community, with the support of local government, assumes the prime responsibility for delivering services.

Projects receive APOC support for eight years, with funding from APOC being mainly focused in the first five years. Three years into a project, APOC conducts an evaluation to determine progress towards achieving sustainability. A detailed evaluation tool addresses sustainability in terms of nine key factors*:

- Planning
- Leadership
- Monitoring and supervision
- Ivermectin supply
- Training
- Financial resources
- Transport and equipment
- Human resources
- Coverage

Performance against these nine indicators is assessed at four levels: province (or national level); district; frontline health facility; and village.

When considering the indicators at these levels, the extent to which the project is integrated into local systems is crucial. After the evaluation has been conducted, a plan is developed based upon the lessons learned to achieve sustainability in the remaining years of the project.

It would be interesting to adopt this approach towards assessing sustainability for a comprehensive eye care programme.

**Case study: Sustainability of LV Prasad Eye Institute (LVPEI)’s Vision Centres**

An LVPEI Vision Centre (VC), staffed by a Vision Technician, can offer recognition of blinding conditions and appropriate referral, as well as provide refractive services. It can also conduct promotive activities. Primary eye care as provided by the VC includes free examinations, while income is generated through the sale of low-cost spectacles. Despite the focus on financial and geographic accessibility, though, it is also important that the VCs become self-sustaining so that their functioning over time becomes viable.

The question of sustainability at this level must be interpreted in a broader manner. It includes:

- **Sustainable human resources**: this means ensuring that the trained eye care worker (the Vision Technician) has sufficient space and direction to not only provide primary level services, but also to grow professionally.
- **Operational sustainability**: it rests on the creation of demand for services through promotive activities and ongoing community relationship management.
- **Sustainable infrastructure**: this calls for continuous maintenance and upgrading of equipment.
- **Financial sustainability**.

Financial sustainability is achieved through income generation from spectacle sales. When VCs are located in relatively busy market areas and along or close to major roadways, this appears to be a viable strategy; such VCs are closer to achieving sustainability than VCs located in more remote regions. The uptake of services also depends on location: VCs in busier areas attract more people.

This may mean that, in some areas, particularly the poorest and most marginalised areas, VCs will never achieve financial sustainability and that the losses from these centres may need to be pooled with the gains from other VCs in order for the enterprise as a whole to achieve its purpose – that of making the appropriate level of eye care available to all.
Of the 19,198 blind children whose education was supported by CBM in 2009, the majority are in regular classes, and this proportion continues to grow.
Rehabilitation of people with vision impairment

Michael Davies, CBM

Bridging the gap between needs and deeds

Although a large number of member states have signed the UN Convention on the Rights of Persons with Disabilities (UNCRPD) and, to a lesser degree, ratified the optional protocol, and although many countries have their own legislation on the rights of their citizens with disabilities, a wide gulf usually exists between words and deeds, and between needs and resources.

In many countries, people with visual disability are still viewed as objects of pity or charity – if they are viewed at all. Special residential schools for blind children, where they exist, are still the first choice; livelihood options still revolve around the hardy perennials – broom and brush making, mat making, upholstery.

Things are starting to change, however. Increasingly, special schools for blind children are being urged to convert into training units for school-readiness – helping blind children to acquire the Braille, abacus, orientation and mobility skills they will need to integrate smoothly into regular schools. This is often complemented by home-based training in activities for daily living and class teacher training, coordinated through community-based rehabilitation (CBR) programmes.

The added advantage of inclusive education is that non-disabled children learn to interact with blind children at an early age, instead of viewing them as strange, different. The cocktail of ignorance and prejudice, pity and compassion that was the product of segregated education is gradually being eroded, leading to a more balanced and inclusive viewpoint in adult life.

The lack of rehabilitation services for visually impaired people in some low- and middle-income countries is being slowly bridged through CBR, which deals holistically with health, education livelihood and social inclusion issues, and attempts to activate local government and other resources to meet the expressed needs of blind people. CBR is also involved in helping to set up self-help groups of people with disabilities, to act as local advocates for access to services.

As educational opportunities for blind children open up, leading to growing numbers of high school graduates, so too do livelihood opportunities diversify. Today, blind teachers, call-centre staff, lawyers, or managers are no longer the rarities they once were.

The multi-faceted services of organisations such as the Blind Persons’ Association in India and Resources for the Blind in the Philippines are prime examples of what can be achieved when we stop concentrating exclusively on an impairment and start thinking about maximising individual potential within the community.

There are still major constraints and risks – lack of educational opportunities, widespread unemployment, natural and man-made disasters, negative attitudes, lack of government funding – but we are starting to notice real progress towards improved access to education, skills acquisition, work, and acceptance of blind people as valued contributing members of society.
The UNCRPD – empowering vision-impaired people

World Blind Union

At the launch of VISION 2020, the empowerment of persons with vision loss and other disabilities was relatively infrequent. The lack of consistent involvement of persons with disabilities in international advocacy efforts at the time is evidenced by the complete absence of reference to disabilities in the Millennium Development Goals (see page 37). Moreover, ten years ago, services and programmes were very much rooted in the traditional medical model without major involvement of persons with disabilities in their design, implementation, and monitoring.

We are now at the beginning of a paradigm shift, from a medical, charity-based model, to a rights-based model of service planning and delivery with involvement of people with disabilities at every stage. The genesis of this change is rooted in the UN Convention on the Rights of Persons with Disabilities (UNCRPD). This treaty now enshrines the rights of persons with disabilities in all aspects of their lives. It was the first international treaty to be developed with such significant contribution from civil society: a disability caucus, which included the World Blind Union (WBU), worked closely with the UN and government delegations to develop the treaty in such a way that it would address the key issues of concern to persons with disabilities. This includes some articles which, when implemented, will drastically improve accessibility and services for persons with vision loss. The CRPD, initially passed by the UN in December 2006, has been ratified – as of April 2010 – by 85 countries, 63 of them developing countries.

A number of factors contributed to this success. The WBU is a strong organisation recognised as representing the views and needs of persons with vision loss at the international level, which lent credibility to its voice and advocacy efforts. In addition, the ability to work collaboratively with other international disability organisations strengthened the voice for common needs and provided support for the unique needs of certain disabilities, such as Braille instruction, for example. Finally, the respect that many WBU members have attained with their governments enabled their involvement with national government positions and speeded up the ratification process.

While we now have a platform for enhanced involvement and services, the work has only just begun. The treaty is only an instrument and will gain its effectiveness through national implementation and monitoring. The fact that several key members of the UNCRPD monitoring committee are blind or low-vision persons, as nominated by their governments, also demonstrates increased empowerment of vision-impaired persons.

It will be critical to work with organisations of the blind at the national level, particularly in developing countries, to provide them with the skills and tools they will need to work alongside other disability groups and to advocate effectively with their governments. Finally, it will also be essential for eye care practitioners to understand and embrace the implications of the CRPD and to involve blind and low vision persons in the design, delivery, and monitoring of programmes and services that will benefit them.
Advocacy
Making the case for eye health

Now eye care has been integrated into state strategic health plans in Nigeria, thousands more people like Alice Udagbo, who had her sight restored by Sightsavers partners in 2009, will have better access to eye care.

Picture courtesy of Jennifer Rule/Sightsavers
The economic argument for VISION 2020

Julian Metcalfe

Visual impairment has profound consequences for affected individuals, their relatives, and society at large – which all make a compelling case for advocating in favour of the control of avoidable visual impairment. Those in charge of overstretched health budgets and agendas, however, may be particularly sensitive to economic arguments. Thankfully, there is ample evidence demonstrating the high cost of visual impairment and the economic benefits of investing in programmes to eliminate or reduce avoidable visual impairment.

The economic cost of blindness

Research is often hampered by the lack of robust data: for example, while eye care health budgets are reasonably accessible in higher income countries, such information is often limited for developing countries. Estimates of productivity loss due to blindness necessarily require assumptions to be made about the participation of blind people in the labour force, underemployment, etc. And evidence gained in one geographical region may not be applicable to another. But, despite all these constraints, a body of literature has emerged highlighting the economic rationale for tackling avoidable blindness.

The costs associated with visual impairment are considerable. Calculation of such costs generally includes the following elements: the direct costs of eye care health programmes; indirect economic costs such as labour productivity loss, the costs of carers and equipment adaptation; and, finally, the social welfare losses resulting from suffering and premature death.

The latter is usually calculated through a concept known as Disability Adjusted Life Years (DALYs) which estimates the number of years lost due to premature mortality or morbidity resulting from a particular medical state: if a particular condition has a high DALY, the case for providing additional resources to address the cause is correspondingly strengthened. Using this methodology, visual impairment ranks as the seventh leading cause of disability worldwide, after perinatal conditions, lower respiratory infection, cardio- and cerebrovascular diseases, and HIV/AIDS. This implies that the allocation of additional effort to treat these disabilities is highly justified. However, not everyone considers the DALY to be a socially acceptable concept, or a robust yardstick for allocating resources.

A comprehensive national-level assessment of the economic cost of visual impairment was carried out in Australia in 2004. This showed that the direct costs of treating eye disease were USD 1.3 billion, more than the cost of managing the impact of coronary disease, or arthritis, in that year. When indirect costs were included, the costs were equivalent to 0.6% of the gross domestic product (GDP). A similar study in the United Kingdom for 2008 calculated that the total costs of visual impairment in adults were equivalent to 0.45% of GDP.

A 2003 study by Frick and Foster estimated at USD 42 billion in the year 2000 the annual loss of productivity of people with visual impairment worldwide. A more recent study estimates that the productivity losses from blindness and low vision amongst developed economies is around USD 167 billion in 2010, rising to USD 176 billion in 2020.

Reducing costs by investing in eye care

A key question is the extent to which these economic costs can be reduced through increased investment in national eye care strategies. This issue has been addressed through two related approaches. The first evaluates the reduction in blindness-related economic costs that might
potentially be achieved by successful eye care interventions. The second approach uses standard techniques to measure the economic return (yield) of an eye care investment programme.

Frick and Foster (2003)\textsuperscript{4} sought to measure the global productivity gains if the VISION 2020 initiative were successful by 2020. They defined success in conservative terms: that the prevalence of blindness would gradually decline, throughout the world, to levels near those seen in developed economies in 2000. Without a decrease in the prevalence of blindness and low vision, it was projected that the total annual costs in terms of loss of productivity by people with visual impairment would rise to USD 71 billion by 2010 and USD 110 billion by 2020. However, if VISION 2020 goals are achieved, this will be reduced to only USD 57 billion in 2020. This equates to overall global savings of USD 223 billion over 20 years (see Figure 1).

**Figure 1**: Projected worldwide cost of reduced productivity due to visual impairment caused by eye diseases, 2000–2020 (estimated in the 1990s)

However, the Frick and Foster data was calculated based on definitions of blindness using ‘best corrected visual acuity’ and therefore excluded the 153 million people with visual impairment due to uncorrected refractive error. A later study\textsuperscript{6} estimated on the most conservative basis that the loss of productivity due to uncorrected refractive error was valued at USD 121 billion in 2007. Combining these studies, we can estimate that, in 2010, the total loss of productivity for all people who are blind and visually impaired was at least USD 200 million and that by 2020 this will increase to at least USD 300 million if nothing is done.

A number of studies have used measures of the economic rate of return as an indicator of the value of investment in eye care programmes. The rate of return is defined as the net income generated by an investment: typically this income is compared to the cost of capital, which, historically, has been around 3%. A very successful programme, focusing on trachoma and cataract surgery, took place in The Gambia between 1986 and 1996.\textsuperscript{7} Surveys were carried out at both the outset and completion of the project. Results suggested a 40% reduction in the overall prevalence of blindness was achieved. The cost of the programme was USD 1.5 million, whilst lifetime benefits (measured by increased labour productivity) were USD 4.5 million. On a discounted basis, this represents an economic return of 10%: this is a high return rate for a healthcare programme, and equates to the rate of return that the World Bank would expect to achieve in a new industrial project.
The programme to address river blindness in West Africa, which was launched in 1974, is estimated to have resulted in an economic rate of return of 20%, through increases in labour productivity and the reclamation of land for agricultural production. Moreover, a study of a World Bank-supported programme to address cataract related blindness in India calculated the annual cost of the programme at USD 0.15 billion, and estimated an economic gain (in terms of increased productivity) of USD 1.1 billion per annum: this is a remarkably high rate of return.

**Economic impact of visual impairment on affected individuals**

A recent study by Polack and Kuper examined the impact of cataract surgery among people aged 50 years and over in three low-income countries (Kenya, Philippines and Bangladesh). On average, household expenditure of those who underwent cataract surgery rose by around 50% (see Figures 2 and 3) – yet further evidence that investment in eye care pays, and contributes to the achievement of a key Millennium Development Goal: the reduction in poverty.

**Figure 2:** Change in per capita expenditure between baseline and follow-up (one year later) in operated cases and controls in Kenya, Bangladesh and the Philippines

**Figure 3:** Proportion of operated cases and controls who undertook productive activities at baseline and follow-up (one year later) in Kenya, Bangladesh and the Philippines
Conclusion

The high rates of return achieved by eye care intervention programmes convey a strikingly clear message to those responsible for managing overburdened health budgets: tackling avoidable blindness is invariably highly cost-effective in terms of the impact that can be achieved per dollar of investment. And if the delivery of eye care programmes is integrated into the provision of other health services, the sharing of overheads (support personnel, transport, energy and water costs) should serve to make eye care interventions even more cost effective.

Of course, treating avoidable blindness does not only generate economic benefits: invariably, those whose sight is improved, or restored, also enjoy significant other benefits related to their overall quality of life. The study mentioned above\(^\text{10}\) recorded some very impressive improvements in health and vision related quality of life indices: in most cases the quality of life of those having undergone cataract surgery became similar to the levels experienced by those who did not suffer visual impairment.

References

Blindness, poverty and the Millennium Development Goals

Peter Ackland

The Millennium Development Goals – an opportunity for advocacy

The eight Millennium Development Goals (MDGs) (see box below) were established by world leaders in 2000 to encourage the international community to join forces against poverty. Targets and indicators have been developed for measuring progress with the intention that all targets be achieved by 2015.1 Three of the MDGs have a health focus and better health has importance and relevance to all eight MDGs. Efforts to achieve the MDGs have brought undoubted success in some areas of health promotion.

The eight Millennium Development Goals

1. Eradicate extreme poverty and hunger 5. Improve maternal health
3. Promote gender equality and empower women 7. Ensure environmental sustainability
4. Reduce child mortality 8. Develop a global partnership for development

Blindness control and development programmes

The prevention of blindness has not been the primary focus of most internationally supported health MDG initiatives, but certainly some of these efforts have had a positive impact upon reducing the prevalence of avoidable blindness:

The international focus on target 5 of MDG 4 (‘Reduce, by two thirds, between 1990 and 2015, the under-five mortality rate’) has benefited blindness control, since many of the conditions associated with child mortality are also causes of blindness in children (e.g. premature birth, measles, congenital rubella syndrome, vitamin A deficiency, and meningitis). For example, vitamin A supplementation is included in global nutritional programmes that have been heavily promoted and such programmes have undoubtedly made a major contribution to the substantial decline in the numbers of children blind from corneal scarring due to vitamin A deficiency (see also box on page 38), though the problem persists in some focal settings.2 Similarly, measles immunisation programmes have also had a substantial impact on blindness in children (see also page 75).

Another example of how blindness control programmes can benefit from more mainstream development programmes is the focus on target 10 of MDG 7 (‘Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation’). Between 1990 and 2006, the international support for water and sanitation programmes has succeeded in increasing access to safer water supplies from 77% of the global population in 1990 to 87% in 2006.3 The focus on WATSAN (water and sanitation) programmes has certainly contributed to the decline in the number of people infected by trachoma (see page 69), providing as they do support for the ‘F’ and ‘E’ (face washing and environmental change) components of the trachoma control SAFE strategy.

Conversely, blindness control initiatives promoted by VISION 2020 – such as onchocerciasis or trachoma control programmes, retinopathy of prematurity control programmes, vision testing and spectacle provision for children, etc. – have contributed towards achieving the MDGs.4
However, the international support for the MDGs has not been all good news for blindness control programmes. The focus upon HIV/AIDS, malaria, and tuberculosis has made it harder for disease programmes not specifically mentioned within the MDGs to attract resources from the international donor community. Indeed, one of the major criticisms of the MDGs has been the lack of reference to disability, and related issues such as prevention, within the MDGs.

The link between disability and poverty

“Unless disabled people are brought into the development mainstream, it will be impossible to cut poverty in half by 2015.” – James Wolfensohn – Former President of the World Bank, 2002

Disabled people can easily become trapped in a recurring cycle of poverty, disability and poverty. When this persists over time they can fall into chronic poverty. Globally, it is estimated that one in five of the world's poorest people have a disability, and 82% of disabled people in developing countries live below the poverty line.\(^5\)

It is recognised that disabled people are often excluded from mainstream social and economic opportunities; they have fewer financial reserves and are more vulnerable to falling into poverty and they face more barriers in rising out of poverty. Disability often leads to loss of employment or a fall in salary. Moreover, the disability of one individual often limits employment for relatives (particularly women) because of the need for assistance with daily tasks. Further, families affected by disability face considerable direct costs, including medical expenses and assistive devices, which exacerbate economic hardship. This leads to the use of reserve stocks to cope with costs, leaving households with lower savings, higher debts, and lower levels of land and asset ownership. The final stage in strategies to cope with the costs of disability is often a reduction in consumption; households affected by disability are more likely to suffer from hunger and food insecurity, indicating their severe level of poverty. Poor nutrition levels in turn weaken people’s health and make them more susceptible to disease... and further impairments or mortality.

Research in three low-income countries – Kenya, Bangladesh and the Philippines – confirmed that people with visual impairment due to cataract were poorer than those with normal sight in all three countries\(^6\) and were substantially less likely to participate in productive activities, including paid work and non-market activities, and in leisure activities outside the household. People with cataract were substantially more likely to require assistance in any activity (than a matched sample of people with no visual impairment).\(^7\) Moreover, studies in Bangladesh and India suggest that, among disabled people, those with a visual impairment are most likely to be unemployed.\(^8,9\)

In 2008, the UN Secretary General remarked on the fact that disabled persons were not mentioned in the MDGs: “There is an urgent need to address the absence of more than 10% of the world’s population in the implementation, review and evaluation of the Millennium Development Goals and their targets, evaluation mechanisms and indicators. The lack of a disability perspective is undermining the objective of the Goals.”\(^10\) Advocacy efforts at the UN Summit to review the MDGs in September 2010 succeeded in the inclusion of disability considerations in the resulting ‘Outcome Document’.

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**The virtuous VISION 2020 cycle**

- Reduction in levels of avoidable blindness and visual impairment
- Increased productivity of $250bn per year by the year 2020
- Improved health and quality of life
- Investing USD 8 billion in VISION 2020 over the next 10 years
The advocacy challenge for VISION 2020

After ten years of VISION 2020, there is empirical evidence that the promotion of eye health and the prevention of blindness help to increase the income and improve the quality of life of both visually impaired people and their families. The research in Kenya, Bangladesh and the Philippines\textsuperscript{6} mentioned above showed that, after a cataract operation, family income and quality of life increased and was comparable to that of control members of the community. In parts of the world where communicable blinding diseases such as trachoma and onchocerciasis are present, control and prevention programmes have increased the prosperity of whole communities. It has been calculated that rates of economic return on investment in these programmes are high\textsuperscript{11} (see also page 33).

Our challenge as champions of VISION 2020 is to promote the ‘virtuous VISION 2020 cycle’ (see page 35) as a strategy that will help contribute to the achievement of the Millennium Development Goals.

References

10. Fifth quinquennial review and appraisal of the World Programme of Action concerning Disabled Persons; UN Secretary General, July 28th 2008.

Fighting hunger is not just filling stomachs – hidden hunger and vitamin A deficiency

Klaus Kraemer

Hidden hunger, the ‘forgotten MDG’

‘Hidden hunger’ can be defined as a lack or loss of dietary quality that leaves individuals or populations with deficiencies in essential micronutrients (vitamins and minerals), which negatively impact on health, cognition, function, survival, and economic potential. Although one target of the MDGs is to ‘Halve the proportion of people who suffer from hunger’, this only addresses food security. Nutrition security needs to be highlighted as well.

Vitamin A deficiency and blindness

Among those diseases attributable to an inadequacy of nutrients in the diet, vitamin A deficiency was shown to hold a prominent place in the middle of the 20\textsuperscript{th} century. At that point, it was the most common cause of blindness in young children worldwide. Within several decades, severe blinding vitamin A deficiency (xerophthalmia) had, to a large extent, been brought under control. Periodic high-dose vitamin A supplementation has become one of the most successful evidence-based public health interventions. Vitamin A coverage with at least two high doses of vitamin A now reaches 71\% of all children aged 6–59 months worldwide and has protected the lives of millions of children in resource-poor countries.\textsuperscript{1}

However, vitamin A deficiency is still responsible for approximately 6\% of mortality and 5\% of DALYs (disability-adjusted life-years) in children under the age of five.\textsuperscript{2} Moreover, not all countries have successful vitamin A programmes, and greater effort and more interventions are required to reach the most vulnerable in the remotest areas of the world. It is estimated that neonatal vitamin A supplementation in South Asia alone could save an additional 250,000 lives each year.\textsuperscript{3,4}
In addition, over the past several years, the decision to no longer report on non-blinding xerophthalmia and blinding xerophthalmia separately has made it difficult to obtain an accurate figure for the number of persons blind from vitamin A deficiency living in any given country or region or within any vulnerable group. As a consequence, while data on other causes of blindness are becoming increasingly precise, vitamin A deficiency blindness is being subsumed under the heading of ‘other causes of childhood blindness’, something which should be rectified.

Creating awareness of micronutrient deficiency

SIGHT AND LIFE, an IAPB member, has contributed significantly to creating awareness of and stimulating discussion on the topic of micronutrients in order to improve nutrition security in developing countries. It is hoped that when world leaders meet again in September 2010 to review progress towards the MDGs, the ‘forgotten MDG’ of hidden hunger will be acknowledged.

The good news is that economists and, increasingly, ministers of economic affairs are beginning to recognise that micronutrient programmes (supplementation and fortification) are cost-effective interventions for improving health – and ultimately productivity – and are a prerequisite to lift individuals, communities and, consequently, nations out of the poverty cycle. Having applied a cost-benefit analysis, the 2008 Copenhagen Consensus, which included leading economists and five Nobel Laureates, ranked the provision of vitamin A and zinc supplements as the best investment and identified micronutrient fortification of staple food as the third-best investment.5

It is also worth noting that there has been a paradigm shift during the last ten years in the perception of the private sector and its role in fighting malnutrition (both under- and over-nutrition). The private sector is now recognised as being an integral part of the solution, and public/private partnerships that truly deliver are becoming a reality more than ever before.

Conclusion

Improving the diets of the world’s poor is a complex and long-term undertaking that requires – at the very least – increased incomes, improved access to a variety of foods and gender equality as well as better health, sanitation and nutrition service delivery. Nonetheless, in the short term, many lives can be saved and improved through a range of cost-effective and efficacious micronutrient interventions.

References

WHA resolutions and the 2009–2013 Action Plan

WHA resolutions on the prevention of blindness

Since the launch of VISION 2020: The Right to Sight, over 100 WHO Member States have joined the initiative, established their national prevention of blindness and eye health committees and developed national prevention of blindness and eye health plans. The prevention of avoidable blindness and visual impairment agenda has been substantially leveraged globally. As a result of advocacy by the international partners in VISION 2020 and commitment of WHO Member States, prevention of avoidable blindness and visual impairment has been repeatedly addressed by the WHO Executive Board and the World Health Assembly (WHA).

Adoption of WHA 56.26 in 2003

In 2003, WHA witnessed the adoption of WHA resolution 56.26 ‘Elimination of avoidable blindness’. The resolution stipulated the following actions:

- set up, no later than 2005, a national VISION 2020 plan in partnership with WHO in collaboration with non-governmental organisations 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 these plans effective monitoring and information systems with the aim of showing a reduction in the extent of avoidable blindness by 2010;
- support the mobilisation of resources for eliminating avoidable blindness.

The international efforts to further promote the VISION 2020 Global Initiative and implement adequate measures to control avoidable blindness led to numerous events and activities at national and district levels.

Adoption of WHA 59.25 in 2006

In 2006, a report on the implementation of WHA resolution 56.26 was presented to the World Health Assembly and during its sessions, a new WHA resolution was adopted to further support prevention of avoidable blindness and visual impairment globally (WHA resolution 59.25 ‘Prevention of avoidable blindness and visual impairment’). The resolution gave renewed support and momentum for this effort, urging Member States to:

- provide support for VISION 2020 plans by mobilising 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;
- make available essential eye care medicines and medical supplies.

Progress in implementing WHA resolution 59.25 is to be reported every three years to the WHO Executive Board. In the meanwhile, the Action Plan for the prevention of avoidable blindness and visual impairment has been developed and adopted by the 62nd WHA in 2009.

WHA resolution 62.1 and the 2009–2013 Action Plan

The development of an action plan to address the eye health agenda was requested by Member States at the 61st WHA taking place in Geneva in 2008. The intention was to complement the existing Action Plan for the Global Strategy for the Prevention and Control of Non-communicable
Advocacy | WHA resolutions and the 2009–2013 Action Plan

Diseases (WHA resolution 61.14). A draft Action Plan was developed by the WHO Secretariat using an open consultative process benefiting from the expertise and experiences of Member States and international partners. Member States were invited to review the Draft Action Plan at an informal consultation in October 2008 and the document was published on the internet for public review. The amended Draft Action Plan was presented to the 124th Executive Board in January 2009 and was discussed extensively. Later, in May 2009, it was endorsed by the 62nd WHA as WHA resolution 62.1 ‘Prevention of avoidable blindness and visual impairment’. The 2009–2013 Action Plan, a result of advocacy at a global level, builds on previous WHA resolutions: WHA 51.11 ‘Global elimination of blinding trachoma’; WHA 56.26 ‘Elimination of avoidable blindness’; and WHA 59.25 ‘Prevention of avoidable blindness and visual impairment’. It is also in itself a tool for advocacy.

The 2009–2013 Action Plan for the prevention of avoidable blindness and visual impairment

The Action Plan for the prevention of avoidable blindness and visual impairment was developed to provide guidance for Member States, the Secretariat and international partners in order to scale up efforts for strengthening eye health in populations by developing comprehensive eye health programmes at national and sub-national levels. The Action Plan supports the implementation of WHO's Eleventh General Programme of Work 2008–2013 and the Medium-term Strategic Plan 2008–2013.

Purpose of the Action Plan

The Action Plan for the prevention of avoidable blindness and visual impairment is designed to:

- increase political and financial commitment to eliminating avoidable blindness;
- review international experience and share lessons learnt and best practices in implementing policies, plans and programmes for the prevention of blindness and visual impairment;
- strengthen partnerships, collaboration and coordination between stakeholders involved in preventing avoidable blindness;
- collect, analyse and disseminate information systematically on trends and progress made in preventing avoidable blindness globally, regionally and nationally.

Content of the Action Plan

The Action Plan draws on the experiences in various socio-economic settings in the control of avoidable blindness and visual impairment. These are summarised in the Situation Analysis section of the document. This is followed by a set of activities, for implementation from 2009 to 2013, which are contained within five objectives:

- strengthen advocacy;
- develop and strengthen national policies, plans and programmes;
- increase and expand research;
- improve coordination between partnerships and stakeholders;
- monitor progress.

Each objective requires separate actions by Member States, the Secretariat and international partners. In addition, in order to identify successful and sustainable interventions and determine which approaches are the most effective for the community, it is important for their impact to be measured. It has been recognised that periodic monitoring, assessment and information sharing is an integral component of the implementation process.
New trends in the magnitude and causes of visual impairment and implications for eye care

There have been significant shifts in the pattern of causes of blindness and visual impairment. Socio-economic development and improved living standards in many societies have resulted in greater control of major communicable causes of blindness such as trachoma and onchocerciasis. While it remains imperative to continue to invest efforts in eliminating communicable eye diseases as causes of visual impairment and blindness, the future challenges in the provision of eye care rest with non-communicable eye conditions. If additional eye care services are not provided, the numbers of people suffering from vision loss due to chronic age-related eye conditions will continue to rise as a result of increased life expectancy compounded by population growth. The Action Plan reflects on the foreseeable trends in the magnitude and causes of visual impairment and blindness and addresses the potential implications for eye care.

In order to prevent avoidable blindness at community level, primary eye care must be strengthened. At national level, the provision of adequate eye care services requires specific skills, technology and infrastructure development. This means that government involvement and support is indispensable in order to provide relevant backing for further development of sustainable, affordable, equitable, and comprehensive eye care systems as an integral part of national health systems. The Action Plan demonstrates that urgent measures need to be taken in order to reduce the prevalence of avoidable visual impairment and blindness. However, the actions described are not prescriptive and it is intended that Member States select appropriate interventions for adaptation to their own settings and target efforts to where they are most needed.

As a product of the key stakeholders concerned with strengthening eye health, the Action Plan is to serve as a roadmap to consolidate our joint efforts towards eliminating avoidable blindness as a public health concern in communities.
Case study: Pakistan

In the span of 15 years, from 1994 to 2009, the prevalence of blindness in Pakistan has decreased almost by half, from 1.78% to 0.9%, as a result of blindness prevention efforts by national and international agencies. The first two national plans for the prevention of blindness (1994–1998 and 1999–2003) were implemented mainly through support of international partners, but in 2005, thanks to ongoing advocacy efforts, the ministry of health launched a formal national programme for the prevention of blindness. The Government of Pakistan allocated USD 50 million to the prevention and control of blindness in 2005–2010.

Advocacy has played a key role in bringing about policy change and, ultimately, government support. The strategy used in Pakistan involved setting up various ‘demonstration projects’ in limited districts, building an evidence base through credible research and ensuring the participation of key government health officials.

Demonstration projects

Concepts were first piloted, then developed as demonstration projects for scalability before they could be put forward to advocate for policy change. For example, the first blindness prevention plan (1994–1998) piloted a comprehensive eye care (CEC) programme in a marginalised district. This intervention demonstrated that strengthened detection and referral pathways resulted in a significant increase in the uptake of eye care services. The pilot project also included training programmes for ophthalmic technicians and public health managers in eye care. During the second blindness prevention plan (1999–2003), the concept of the pilot approach was tested in several districts. In particular, a public sector training centre was established in each province.

The support of INGOs, WHO and corporate partners was mobilised in order to finance these piloting and demonstration phases. The successful outcomes of these demonstration projects were coupled with a systematic evidence base to maximise the effectiveness of advocacy for policy change.

Building an evidence base

One of the vital requirements of advocacy was to build a credible evidence base that could be presented to health planners and policy makers. The research used to gather evidence was funded by international partners. The results of these research activities are shown in Table 1.

Ensuring the participation of key government officials

It is governments who tend to scale up elements of programmes, therefore the participatory involvement of key government health officials in policy and planning is required at each step of planning, implementation, monitoring and evaluation.

Although advocacy initiatives had been ongoing since the early 1990s to lobby for government commitment to the prevention of blindness, it was in 2005 that the advocacy strategy was clearly defined and intensified. Three of its five key components were designed to dramatically increase government involvement:

- place stewardship and leadership for the prevention of blindness with the ministry of health and provincial health departments;
- ensure active involvement and participation of district administration in district CEC;
- align with institutional mechanisms for policy, planning and allocation of resources.
This advocacy plan resulted in the launch of a formal national programme for the prevention and control of blindness 2005–2010. The government committed to upgrading the eye departments of 27 teaching, 63 district and 147 sub-district hospitals, as well as creating 2,719 posts for eye care at teaching hospital, district and sub-district levels and its recognised eye health as a prevention and health promotion strategy in primary health care.

Table 1: Building an evidence base for advocacy

<table>
<thead>
<tr>
<th>Research activity</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>National blindness survey (1988–1990)</td>
<td>Identified a prevalence of blindness of 1.78%¹</td>
</tr>
<tr>
<td>Situation analysis of district eye services (2000)</td>
<td>Revealed that 43% of districts had no eye care services²</td>
</tr>
<tr>
<td>Mapping of cataract surgical services (2001)</td>
<td>Found that Pakistan had a cataract surgical rate of about 2,250 per million population and also identified priority districts for upgrading</td>
</tr>
<tr>
<td>Situation analysis of paediatric eye health services (2003)</td>
<td>Determined the need for a paediatric ophthalmology speciality</td>
</tr>
<tr>
<td>National trachoma rapid assessment survey (2003)</td>
<td>Identified 233 villages with endemic trachoma and laid the foundation for a trachoma control programme</td>
</tr>
<tr>
<td>Evaluation of 10 district comprehensive eye care demonstration project (2004)</td>
<td>Demonstrated that the comprehensive eye care (CEC) district-based strategy could be taken to scale; also demonstrated that CEC had a positive impact on the uptake of services by gender</td>
</tr>
<tr>
<td>Second national blindness survey (2002–2004)</td>
<td>Revealed a 50% reduction in the prevalence of blindness to 0.9%³</td>
</tr>
<tr>
<td>National survey of schools for the blind (2004)</td>
<td>Found that retinal disease was the most common cause of blindness in children</td>
</tr>
<tr>
<td>Situation analysis of refractive error services (2006)</td>
<td>Surveyed over 2,000 optician service outlets and all eye care services and found that at least 6 million refractions and over 2 million spectacles were being dispensed annually</td>
</tr>
<tr>
<td>Poverty and blindness (2008)</td>
<td>Documented a definitive association between blindness and poverty⁴</td>
</tr>
</tbody>
</table>

**Conclusion**

In Pakistan, the diffusion of learnings from pilot and demonstration projects, and of the results of credible research, has been crucial to the success of advocacy. It has allowed the extension of these early initiatives on a national scale and the launch of Pakistan’s first formal national blindness prevention programme by the ministry of health.

**Three factors crucial to the success of advocacy in Pakistan:**
- demonstration projects on a limited scale
- building an evidence base from credible research
- involvement and participation of key government officials at every stage of the process to ensure ownership

**References**

Case study: India

India was the first country in the world to start a national programme for the control of blindness (NPCB) in 1976. Over the years, the national programme has been periodically evaluated and upgraded. During the formulation of the latest five-year national plan for the control of blindness (2007–2012), VISION 2020 India successfully advocated for the plan to include other diseases besides cataract and refractive error (such as diabetic retinopathy, glaucoma and childhood blindness) and for an increase in financial resources allocated to it. This resulted in the approval by the Government of India of a comprehensive eye care national programme addressing the key issues of preventable blindness in India and of a threefold increase in the budget.

The stages of this successful advocacy campaign included:

**Sensitisation meetings**

The *raison d’être* for VISION 2020 India is to work with the Government of India and other key stakeholders to eliminate avoidable blindness from India. The Government of India, WHO and IAPB are invitees on the VISION 2020 India board.

During the formulation stage of the plan, meetings were held with key political leaders, government officials to inform them about the need for a more comprehensive national plan for the control of blindness.

**Formation of a taskforce**

The Government of India formed a taskforce to prepare the five-year plan which included key board members of VISION 2020 India. The focus was on planning for a comprehensive eye care programme which would be able to address the emerging eye health issues in India. The taskforce’s report was then submitted to the ministry.

The United Nations Convention on the Rights of People with Disabilities (CRPD) takes to a new height the shift from viewing persons with disabilities as “objects” of charity and medical treatment towards viewing them as individuals with rights, who are capable of claiming those rights, and becoming active members of their communities. Pictured here is a noteworthy example of a young gentleman from India who is blind and who is enjoying real equality in society as he joins the microenterprise revolution and exercises his rights to self-employment.
The plan was approved by the Government of India and they sanctioned USD 270 million for 5 years. The approved plan included new disease components (diabetic retinopathy, glaucoma, childhood blindness, keratoplasty). It included plans to establish 3,000 Vision Centres (each Vision Centre will cater to the primary eye care needs of a population of 50,000), and to strengthen 30 eye banks, 130 eye donation centres and 40 voluntary organisations.

Making advocacy an ongoing part of the VISION 2020 India strategic plan

In recognition of its continued importance, VISION 2020 India has included advocacy as a key component of its strategic plan. In practice, this has led to the organisation of a workshop (‘Roadmap to advocacy’) in 2010, which included representatives from the ministry of health, international and national eye care NGOs, as well as eye health institutions in India. For each challenging issue faced by the NPCB, the participants determined a specific advocacy campaign, in particular:

- the existing evidence or argument in favour of action;
- the advocacy mechanism to be used (e.g. preparation of an evidence-based case document, or a campaign on public television);
- the audience to be targeted;
- who would do it;
- what the first milestone could be (e.g. meeting with NPCB officials to present the data collected);
- the timeframe in which to achieve this;
- the desired final outcome.

Three factors crucial to the success of advocacy in India:

- Holding sensitisation meeting with key stakeholders
- Creating a taskforce which included members of the government and of VISION 2020 India, to agree on a national plan
- Organising a workshop with stakeholders (‘Roadmap to advocacy’) to decide on specific advocacy actions, targets and timelines to tackle important issues, and on leaders to carry forward each issue
Case study: Latin America

In 2004, VISION 2020 Latin America was launched as a partnership between IAPB, the Pan American Health Organization (PAHO), and the Pan American Association of Ophthalmology (PAAO).

The region comprises 19 Spanish- and Portuguese-speaking countries in the Caribbean and continental America. In 2004, while many well-known ophthalmologists were aware of the public health implications and epidemiology of blindness and visual impairment in each of their respective countries, many potential stakeholders knew little about community eye health and were unaware of the need for blindness prevention initiatives in the region. Six years on, all 19 countries now have a functional VISION 2020 national committee and 16 have a national plan. This remarkable success is due in no small part to intensive advocacy efforts throughout the region. The strategy used included:

Educating volunteers to create a VISION 2020 team

In most countries in the region, there has initially been a strong advocate of VISION 2020 with a long-term view and commitment, be it an individual or a group of individuals, to kick start and drive the process: for example, a former minister of health in Colombia, who is also an ophthalmologist, the regional representative for CBM, located in Ecuador, the Presidents of Chile and Panama’s National Societies of Ophthalmology, renowned professors in Argentina and Brazil, important local foundations in Ecuador, Paraguay, El Salvador, Guatemala, etc.

However, it requires a team of players with different roles to make things happen, rather than just one expert. In the beginning, therefore, it was necessary to find volunteers to form a nucleus in each country and to educate them on blindness prevention and public health issues, particularly:

- how eye services work (different models, how to start an eye service, what is required to keep it functional and sustainable);
- what community eye health is;
- how national health care services work and policies that affect ophthalmology;
- who the stakeholders are in any kind of VISION 2020 programme;
- how to determine ophthalmic priorities in each country based on real data, not expert opinion or guesswork.

The most effective education venues have been workshops, particularly workshops that have dealt with community eye health, project management, and training and human resources. Most of the workshops in the region have been supported by the International Centre for Eye Health (based in the United Kingdom) and CBM.

Creating awareness among stakeholders

Education of government personnel, community and civic leaders, ophthalmologists in the private sector, and other stakeholders has been equally important. Most importantly, regional advocacy efforts creating awareness of the plight of the blind and the visually impaired, especially in poor and rural areas, have helped establish the need for communication of this information to everyone who might have a stake in VISION 2020’s success. This lends more credibility to the VISION 2020 concept and plan on a local, country, and regional basis.

Partnerships

Collaboration has been strengthened and extended between PAHO, national and local governments, the private sector, national Societies of ophthalmology, the not-for-profit sector and communities – all of which have a stake in ophthalmic projects. This has been essential to reinforce the credibility of
each national VISION 2020 committee, as without strong collaboration, such committees tend to be regarded as a collection of isolated academics or clinicians. Interaction with PAHO led last year to the adoption of a Regional Visual Health Plan approved by all the ministries of health.

New tools to reinforce advocacy

The following developments have helped reinforce the initial advocacy efforts:

- Regional publications (182 papers in peer-reviewed journals or chapters in books by regional VISION 2020 members), a quarterly electronic journal, a regional website (with seeding money from ORBIS), and the Spanish edition of the Community Eye Health Journal (CEHJ);
- Regional guidelines (on advocacy, retinopathy of prematurity (ROP), cataract and diabetic retinopathy) and our own promotional video;
- Studies using the Rapid Assessment of Cataract Surgical Services (RACSS) or Rapid Assessment of Avoidable Blindness (RAAB) methods, conducted in 13 countries in the region, have been used to lobby governments and other stakeholders;
- Conferences, such as the three VISION 2020 Ibero American Congresses, IAPB's eighth General Assembly in 2008, or the first ever VISION 2020 Central America Meeting (2009);
- Finally, advocacy visits have helped to monitor and support local initiatives. Many of them were conducted with other major stakeholders such as PAHO, CBM and ORBIS and their purpose varied from country to country: e.g. help restart the National VISION 2020 Committee in Guatemala, develop the National Plan in Peru, or explain the programme to the new ministry of health authorities in El Salvador, etc.

Conclusion

Six years after the launch of VISION 2020 in Latin America, impressive progress has been achieved. Credible national VISION 2020 committees have been established in all countries, as well as regional VISION 2020 technical subcommittees based across the region. National blindness prevention plans are gradually being drawn up, the latest one having been commissioned by the Costa Rican government in June 2010.

In many countries, training centres have also been set up for all levels of ophthalmic personnel, teaching appropriate surgical techniques or how to set up viable eye service centres. For example, Peru and Guatemala both have several training centres; there are also some regional training resource centres, including Fundación Visión in Paraguay. Community eye health and public health courses and activities have also been included in residency training programmes. In many cases developing specific programmes, such as diabetic retinopathy and ROP screening in Chile, Costa Rica, Paraguay, Mexico, Peru and Brazil – to mention just a few – has been another step forward, although there is a long way to go.

Continued advocacy, which has helped foster these developments, is still needed for VISION 2020 activities to expand in what is already a very dynamic region.

Three factors crucial to the success of advocacy in Latin America:

- Local advocacy champions with long-term vision and commitment, acting as a driving force for VISION 2020
- Educating VISION 2020 teams and stakeholders
- Extensive partnership and coordination throughout the region
Case study: Asia Pacific Region

At the end of 2007, the first budget of the newly elected government formed by the Australian Labor Party (ALP) allocated AUD 45 million to establish the Avoidable Blindness Initiative, as part of the Australian aid programme (AusAID). Two years later, as a partnership between AusAID and VISION 2020 Australia, the VISION 2020 Australia Global Consortium was launched, with a view to fighting avoidable blindness in the Asia Pacific region. These developments are in fact the result of an advocacy campaign which combined sound strategic thinking and opportunistic action. A strong conviction and relentless persistence, combined with a little luck, also helped.

Seizing an opportunity for advocacy

The beginning of this advocacy success story can be traced back to 4 December 2006 when the Hon Kevin Rudd was elected Leader of the Australian Labor Party (ALP) – then in Opposition. The political climate was changing in Australia and the new Leader of the Opposition – who was to become Prime Minister – believed that the country needed to be actively engaged in international efforts to meet the global challenges that affect us all.

VISION 2020 Australia’s advocacy plan began with an opportunity to attend the ALP National Conference in May 2007. The chair, the Hon Dr Barry Jones AO, former ALP Minister and President of the ALP, organised this opportunity and secured introductions to key shadow ministers – including the Hon Bob McMullan who went on to become the Parliamentary Secretary for International Development after Labor’s election win in November 2007.

With just five minutes to influence this key decision-maker, the message was that we had a big idea – an ambitious plan to eliminate avoidable blindness in the region. We also had the expertise required to translate this idea into action – all that was missing was the Australian Government’s support.

Following up with evidence

A follow-up meeting was requested to enable Mr McMullan to hear from Australian eye health leaders about our big idea and how this would transform the lives of millions of our neighbours living in the Asia Pacific region.

The meeting was a huge success – demonstrating the strength of collaboration within the Australian eye health and vision care sector. Following the meeting, the VISION 2020 Australia Global Committee developed a three-phased ten-year Regional Plan, which was submitted to the Australian Government and the Opposition. At the request of Mr McMullan, a more detailed Phase One Plan was prepared, which went on to become an ALP election promise and eventual policy.
On World Sight Day 2007, just five months after our initial meeting, the Hon Bob McMullan, announced that the ALP, if elected, would commit AUD 45 million over two years to an Avoidable Blindness Initiative (ABI). Shortly after this announcement, the Liberal Government announced its support for eliminating avoidable blindness in the Asia Pacific region, pledging AUD 60 million over ten years.

On 24 November 2007, the ALP won the Federal Election and in its first Budget allocated AUD 45 million to establish the ABI, which was included as part of the Government’s proposed disability strategy: Development for All: Towards a disability-inclusive Australian aid program.

Collaborative planning: the ABI takes shape
Following the funding announcement, interested members of VISION 2020 Australia met to explore how best to approach working together. Members contributed funding to set up a Secretariat to facilitate progress and assist members to establish a governance framework and commence collaborative planning. The first step was to identify current programming in the region (by whom and where) and then determine the varying capacities of each agency.

At the same time talks with AusAID progressed. Initially, AusAID was focused on recruiting staff to the newly established Disability Inclusive Development section and launching the disability strategy. Over time the scope and focus of the ABI become clear and funding started to flow – at first through a series of small grants to a number of member organisations and through signing a bilateral agreement with NZAID to strengthen training institutions in the Pacific region. Planning for the Vietnam Australia Vision Support Program also commenced.

Both VISION 2020 Australia members and AusAID were exploring the model needed to implement the ABI. It was agreed that a Consortium model, a first for the sector and AusAID, would be appropriate. After many months of discussion and negotiation, a work plan was developed; governance processes were finalised and agreements signed by all Consortium members.

The Australia Global Consortium is launched and implementation begins
On 19 November 2009, two years after the Labor Government’s election promise was announced, the first milestone of this exciting initiative was realised when the Hon Bob McMullan launched the VISION 2020 Australia Global Consortium. At the launch he announced that AusAID would sign a Partnership Framework with VISION 2020 Australia and provide funding of AUD 15 million to enable the Consortium to implement its initial work plan over a two-year period. A new chapter has now begun, with 15 programmes being implemented across the region by the Consortium agencies.

Conclusion
As we move towards 2020 and prepare for the next ten years, VISION 2020 Australia continues to advocate for ongoing funding to achieve the ambitious goals of its Regional Plan and transform the lives of millions of people living in the Asia Pacific region.

Three factors crucial to the success of advocacy for the Asia Pacific Region:
- Seizing the opportunity to deliver a short, effective advocacy message to a key decision-maker
- Gathering evidence for advocacy and strategy
- Long-term collaborative planning with other agencies
Case study: Eastern Mediterranean Region

The Eastern Mediterranean Region (EMR) has played significant advocacy roles both regionally and internationally.

Regional advocacy

Regionally, the EMR has been instrumental in the adoption of a Regional WHO resolution in 2005 (EM/RC52/R3). The EMR’s advocacy efforts have also ensured that all 22 countries in the region, including those facing serious internal strife and security challenges:

- ratified the VISION 2020 declaration;
- established a national committee for the prevention of blindness;
- and developed a national eye care plan.

The EMR recently organised a workshop for leadership, programme management and advocacy for all its national coordinators. This workshop was designed to improve their leadership and advocacy skills, especially with regard to the workings of WHO and government agencies in developing country cooperation strategies.

Information dissemination is vital to advancing advocacy activities. In this regard, the EMR has launched a quarterly e-newsletter, in conjunction with an international conglomerate of NGOs called Prevention of Blindness Union (PBU). The EMR also plans to develop a regional website to highlight and advocate VISION 2020 activities.

Global advocacy

Over recent years, IAPB members have been asked to support a number of advocacy objectives that targeted the adoption of WHA resolutions and WHO organisational plans and budgets. The EMR, led by His Royal Highness Prince Abdulaziz Ahmed Abdulaziz AlSaud, and supported by Dr Abdulaziz AlRajhi, has played a vital leadership role throughout. Personal contacts with key decision-makers have been vital in achieving the successes to date. The influence of His Royal Highness Prince Abdulaziz Ahmed Abdulaziz AlSaud has been hugely important and his leadership of the whole advocacy effort has undoubtedly been the key to success in obtaining the adoption of two major World Health Assembly resolutions (WHA 56.26 in 2003 and WHA 59.25 in 2006) and of WHO’s Action Plan for the Prevention of Blindness.

Three factors crucial to the success of global advocacy by the Eastern Mediterranean Region:

- Developing the evidence base
- Lobbying decision-makers and ministers of health individually, both in informal settings and during formal meetings
- Preparing high-quality proposals

During the discussion on the prevention of avoidable blindness and visual impairment, His Royal Highness Prince Abdulaziz bin Ahmed bin Abdulaziz of Saudi Arabia addressed Committee ‘A’
The ‘Bright and Smile Initiative’ was an ambitious project launched in May 2009 by the Jiangxi Provincial Government. It aimed to provide free cataract surgery to eliminate the backlog of cataracts within the province. Mr Yang, 60, was one of 160,360 people to receive free cataract surgery as a result of this project. “The success of Bright and Smile Initiative is due to the vision and strong leadership of the provincial government to improve the lives of ordinary older people.” says Dr Leshan Tan, Country Manager of The Fred Hollows Foundation, which collaborated with the government on the initiative.
Cataract (opacification of the lens) is the most important cause of blindness worldwide. Most cases of cataract are due to ageing and cannot be prevented. Other frequently associated risk factors are injury, certain eye diseases (e.g. uveitis), diabetes, ultraviolet irradiation and smoking. Due to the lack of eye care services, cataract-related visual impairment occurs far more frequently in low- and middle-income countries than it does in high-income countries.

Cataract surgery followed by the insertion of an intraocular lens results in almost immediate visual rehabilitation. The two main surgical techniques used are extracapsular lens extraction (which can be done through a small sutureless incision or a standard incision requiring sutures) and phacoemulsification (in which the lens is fragmented by an ultrasound probe and aspirated). The insertion of an intraocular lens is the optimal method to correct aphakia (absence of lens in the eye), but thick aphakic spectacles are still being used in certain settings. Cataract surgery has been shown to be one of the most cost-effective health interventions.

Introduction
Cataract was the principal cause of blindness worldwide when VISION 2020 was launched. The WHO Global Data Bank on Blindness estimated that in 1990 there were 15.8 million people blind from cataract, making up 41.8% of the total 38 million blind worldwide. Cataract blindness was most common in the poorer parts of the world, where it was typically responsible for half or more of cases of blindness.

Current situation
Cataract remains the leading cause of blindness in the world today. The latest WHO estimates show that 17.6 million people are blind from cataract, making up 39.1% of the total 45 million blind worldwide. Although extrapolations of the data from 1990 suggested that 25 million people would be blind from cataract in 2000, these projections have not been confirmed.

Cataract blindness remains more common in the poorer parts of the world, where it is usually responsible for half or more of blindness. In 2002, Africa and Asia were worst affected as cataract was responsible for 49-65% of blindness. In contrast, the proportion of blindness due to cataract was very low in higher income settings (5% in 2002 in established market economies). Recent results from national surveys in Bangladesh, Pakistan and Nigeria have confirmed cataract as the leading cause of blindness.

The global population is rapidly growing and ageing. In 1990, there were 5.3 billion people in the world. This figure rose to 6.1 billion in 2000 and to 6.8 million today. At the same time, the proportion of the world population aged 50 years and above has increased from 18% in 2000 to 21% today and is expected to rise up to 25% in 2020. It is therefore likely that the magnitude of blindness from cataract will continue to grow as a result of population growth and ageing, unless far-reaching measures are undertaken to increase cataract surgical services.

Cataract was one of the five priority diseases at the launch of VISION 2020 in 1999, on account of its high prevalence and the availability of an effective treatment. Consequently, there have been concerted, coordinated efforts to address cataract blindness in different settings. Significant achievements have been made over the past ten years:
Increase in the number of operations being performed

There has been a marked increase in the number of cataract operations being performed since the advent of VISION 2020 in 1999. Table 1 shows an estimate of cataract surgical rates (CSR) – i.e. the number of cataract surgeries performed per million population per year – in 19 countries in Latin America.\(^9\) The CSR has increased between 2005 and 2008 in 16 out of the 19 countries, and evidence suggests that this is true in many other regions.\(^10\) However, the CSR in Africa is often below 500 operations per million people per year, although up to four times as many operations may be needed to meet VISION 2020 targets.\(^11\)

Table 1: Published data on the cataract surgical rate in 19 countries in South and Central America\(^8\) and additional unpublished data for 2009\(^16\)

<table>
<thead>
<tr>
<th>Country</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
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<tr>
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<td>1,754</td>
<td>2,750</td>
<td>2,950</td>
</tr>
</tbody>
</table>

Change in surgical technique

In many low- or middle-income settings, there has been a shift in cataract surgical technique away from large incision extracapsular cataract extraction to small incision techniques. This includes both phacoemulsification and manual small incision cataract surgery (MSICS). These techniques reduce astigmatism and trauma to the eye, thereby improving the visual outcome after surgery. MSICS requires fewer resources and minimal highly technical equipment. It has been shown to be an effective method in low-income settings and is widely used.

Availability of intraocular lenses (IOLs)

The use of IOLs in cataract surgery has increased dramatically.\(^12\) This is a result of their decreased cost and increased availability (low-cost IOLs being available from India and elsewhere). IOL surgery is now considered standard in most hospitals and has improved surgical outcomes.

Successful strategies

Several strategies have worked to improve the CSR; these are also outlined in the VISION 2020 Action Plan 2006–2011.\(^13\)

- Creating demand for surgical services by raising awareness amongst local communities.
  For example, in Malawi, drama groups have been visiting local communities to raise awareness about cataract.
● **Providing affordable surgery by using innovative methods of cost recovery.** Many innovative examples of cost recovery for cataract surgery have been developed. For instance, Aravind Eye Care System uses a tiered payment system, which provides high-standard accommodation for those who are wealthy and supplements free surgery for those who are unable to pay, while the quality of surgery remains guaranteed for all patients. This model has been replicated in many parts of the world. Affordable surgery is also likely to increase demand.

● **Providing services close to home.** This reduces some barriers to the uptake of cataract surgery. In rural Nepal, for example, it can take up to two days’ travel to reach the nearest hospital. Eye teams travel to these isolated communities and conduct cataract surgery locally. It has, however, been acknowledged that surgery in eye camps is not ideal unless all the components required for a good quality service are in place (optimal sterilisation, necessary equipment and consumables, adequate follow-up).

### Challenges

Despite the achievements of the past ten years, many people remain unnecessarily blind due to cataract and population growth and ageing poses a further challenge. Cataract surgical services must be provided at a rate adequate to eliminate the backlog of cataract operations 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. Important challenges still remain:

● **Improving quality as well as quantity.** Recent evidence suggests that the visual outcome of cataract surgery is frequently sub-optimal, with up to 20% of patients having a 'poor' outcome (visual acuity worse than 6/60). Without high-quality surgery, uptake will inevitably be low. The challenge is to maintain high numbers of operations whilst ensuring high-quality outcomes. High-quality surgery means an optimal surgical environment and technique, the use of intraocular lenses and appropriate follow-up and aftercare, including refraction. The outcome of surgery should be monitored and VISION 2020 has produced systems for this.

● **Addressing human resource needs.** There is still a critical shortage of ophthalmic surgeons in many countries. In Africa, particularly, there is often less than one ophthalmologist per million people. The lack of ophthalmologists in many countries has led to the development of ‘cataract surgery providers’, non-ophthalmologists who are trained in cataract surgery. This approach has been implemented in countries such as Ethiopia and Kenya. Cataract surgery providers can be general medical practitioners, experienced clinical officers, ophthalmic medical assistants or nurses. Whatever is deemed to be appropriate prior training and experience, cataract surgery providers must undergo rigorous, well-documented surgical cataract training, prove themselves capable of acceptable surgical outcomes, and remain carefully monitored by ‘supervising ophthalmologists’. Even when the number of surgeons per head of population seems high, this frequently hides the fact that most of the surgeons work in urban areas. VISION 2020 partners need to champion a coherent approach to the training and deployment of cataract surgical teams.

● **Integration of cataract services within health systems.** Cataract services need to be integrated within wider health systems. They need to link with procurement supply chains, human resource development plans and training systems, in order to ensure sustainability and impact. Governmental and nongovernmental services (including community outreach services) need to be complimentary.

### Targeting Cataract: Countdown to 2020

- Increasing the quality as well as the quantity of cataract operations
- Training more personnel to provide cataract surgery
- Identifying and overcoming barriers to cataract surgery uptake
- Providing affordable surgery closer to home
One million cataract operations

The Government of the People’s Republic of China has launched a project which aims to deliver one million cataract operations to rural and poor patients within 2009–2011, as part of the national health care reform plan. The central government will allocate 800 RMB Yuan to subsidise each patient. In addition, many provincial governments will devote some amount of capital to the project. According to the plan, 200,000, 350,000 and 450,000 cataract patients will undergo surgery in 2009, 2010 and 2011, respectively.

In 2009, over 210,000 patients received prompt sight-restoring surgery thanks to this project. Nearly one third of the cataract operations planned for the year 2010 had been performed by June 2010 – other operations performed for a fee are not included in this figure.

The ministry of health set up a complete plan for the management of this project; this included formulating – for designated county-level hospitals – operating procedure and quality control standards to ensure patient safety. The ministry hopes that completing one million cataract operations over three years will greatly enhance the capacity of the health workforce at grassroots level as a result.

References

8. Information collated by the authors from www.census.gov, a website maintained by the US Census Bureau.
15. The software ‘Monitoring cataract surgical outcomes’ can be downloaded for free at www.cehjournal.org/files/s1001.html
16. Personal communication from Dr Van Lansingh.

Juldeh said that she was very happy and was looking forward to getting back to normal, fetching water, cooking and pounding rice. “I am very happy that the cataract operation has been a success and now I have my vision back in one eye, now I’ll be able to pound the rice and look after the children.”
Uncorrected refractive error

Brien Holden

Refractive errors (myopia, astigmatism and presbyopia) result in a blurred retinal image and, if uncorrected at higher levels, cause vision impairment and blindness. Spectacles are the most common and the least expensive method of correcting refractive errors; the two other options are contact lenses – more expensive and not suitable in all settings – and refractive laser surgery. Refractive errors are the main cause of visual impairment and the second most common cause of blindness for both distance and near vision. Uncorrected refractive errors can result in lost educational and employment opportunities, lower productivity and impaired quality of life, creating a disability that pushes millions of people into poverty.

Introduction

The first studies that drew attention to the fact that uncorrected refractive error was the major cause of impaired vision and a significant cause of blindness were published in the late 1990s.¹,² The definitions of blindness and low vision at the time were based on ‘best corrected visual acuity’, which hindered the generation of data showing that ‘habitual or presenting’ vision impairment due to uncorrected refractive error was a major global problem.

Current situation

Soon after VISION 2020 was launched in 1999, refractive error began to be included in the list of causes of preventable blindness. However, even then, the magnitude of the problem was not apparent. In 2003, WHO recommended that, in the definitions of blindness and low vision, ‘best corrected visual acuity’ be replaced with ‘presenting visual acuity’, in order to generate data on the ‘real’ contribution of uncorrected refractive error to vision impairment in the world. It was only on World Sight Day in 2006 that WHO revealed that 153 million people over the age of five are visually impaired due to uncorrected refractive error, amongst whom approximately eight million are blind.³,⁴ A further 517 million people have significant near vision impairment and near blindness as a result of uncorrected presbyopia⁵ – making a total of 670 million people overall.

Significantly reducing uncorrected refractive error is a major problem globally because of two very substantial exacerbating factors – the global epidemic in myopia and the ageing of the world’s population. Globally, uncorrected refractive error is the main cause of visual impairment in children aged 5–15 years with up to 60% of Asian and other younger populations around the world not having access to spectacles.⁶ With the prevalence of myopia reaching 70–80% in teenage children in urban areas of South-East Asia,⁷ keeping pace with the rapidly increasing need requires urgent and widespread action.

In the least developed countries the chance of presbyopic adults having the necessary reading glasses varies between 6% and 25%.⁸ With 90% of older people in these countries not having the glasses they need to work or meet everyday vision needs,⁹ the social and economic costs to families, communities and society in general are very high. It has been estimated that the cost of distance refractive error alone in lost productivity and direct and indirect societal costs is over USD 269 billion.⁸ The cost of uncorrected presbyopia has yet to be estimated.
Successful strategies

- The development of the WHO’s Refractive Error Working Group in 2000 was an important step toward defining the issues around refractive error, stimulating situational analyses in many countries around the world, and introducing priorities for vision services and spectacle correction into national VISION 2020 programmes. The subsequent analysis of this information led to a definitive paper on uncorrected refractive error and to the 2006 World Sight Day statement by WHO on the importance of uncorrected refractive error.³

- The IAPB’s Refractive Error Programme Committee’s Strategy for the Elimination of Vision Impairment from Uncorrected Refractive Error followed in 2009.⁹

- The World Congress on Refractive Error and Service Development in 2007 in South Africa, involving more than 650 international delegates, provided a further opportunity to identify public health priorities and strategies. The Durban Declaration on Refractive Error and Service Development included a blueprint and priorities for action.

- Successful models of refractive error services in the community. The LV Prasad Eye Institute (LVPEI), in India, has successfully presented a system for delivering vision care to those in need on a large scale. The key element in the delivery of refractive services is the Vision Centre, a small facility with a trained Vision Technician or optometrist to deliver eye care to 50,000 people, including: primary eye care, refraction, dispensing of spectacles, detection and referral of sight-threatening conditions, as well as spectacle-making facilities in every five Vision Centres. These ‘district’ Vision Centres are transforming the delivery of eye care and have been adopted as a method to decentralise refractive error and eye care services, from Aboriginal communities in Australia to communities in need throughout Africa and Asia. Vision Centres can be easily and rapidly established and supported by Government, NGOs, communities and philanthropists, provided human resource development keeps pace. They should however be integrated within other district health and national health priorities.

- A partnership approach is important in establishing sustainable programmes. An example of this is the International Centre for Eyecare Education (ICEE)’s programme with the KwaZulu Natal government in South Africa. Other examples include the Standard Chartered Bank’s initiative ‘Seeing is Believing’ and Optometry Giving Sight’s ‘Vision for Africa’ programmes. Such programmes not only establish a local service provision system, but also help to expand and develop the LVPEI Vision Centre model so that it can be implemented in communities in need all over the world in public, private (NGO) and public-private mode.

- Human resource development. LVPEI established its own School of Optometry to train vision technicians over a year and optometrists over four years, through a sponsorship from industry. Partnerships between IAPB partners, governments and education institutions have led to the establishment of Schools of Optometry in Malawi and Mozambique to provide training at a regional level for both optometric technicians (two years’ training) and optometrists (four years) in a modular approach – the forerunners of many such Schools in Africa. New training curricula for optometrists and optometric technicians have been developed by ICEE and others, together with a full complement of accompanying teaching materials, freely available to all.

- The availability of low-cost but good-quality lenses, frames and ready-made spectacles to support refractive error programmes has been made possible by such initiatives as the ICEE depot in South Africa. Such supplies provide access to affordable spectacles to even the poorest communities. This has meant that recycling second-hand spectacles donated by people in wealthier countries is no longer a sensible strategy.

- Resource mobilisation. IAPB established a partnership with ICEE and the World Council of Optometry (WCO) to create Optometry Giving Sight (OGS) to raise funds from optometrists in high-income countries to support refractive error programmes and especially human resource development. This is considerably accelerating worldwide recognition, by optometrists and the optical industry, of the need to support public health programmes in refractive error. A further effect has been the recognition by governments of the success of model programmes for uncorrected refractive error.
The recent Australian Government’s AusAid funding of AUD 45 million allocated to the Australian Blindness Initiative includes a substantial commitment to the implementation of strategies to eliminate uncorrected refractive error, including major national refraction training centres in Cambodia and Vietnam.

Challenges remaining

- Extensively scaling-up the delivery of quality eye examinations and spectacles. Vision Centres can solve the refractive error problem and achieve major public health benefits, not only in correcting refractive error but in preventing blinding diseases by detection and referral. The ‘Scale Up’ challenge is hugely exacerbated by the myopia epidemic, which reaches levels of up to 80% in many Asian countries and 42% in the United States, and with the number of people without adequate correction of presbyopia projected to increase to 710 million in 2020 without intervention to make spectacles more accessible.

- Increasing the number and quality of eye care personnel is crucial. It is just as important to develop systems that will effectively compensate and create career paths for the personnel involved in serving remote and underserved communities.

- Expanding school screening on a large scale, and simultaneously providing refraction, eye care examination and spectacles.

- Assisting the ‘supply chain’ for optical products. National policies are needed to encourage the development of an optical industry and the procurement of spectacle frames and lenses, and to remove crippling duties on the importation of low-cost lenses and frames where they are not readily available in the country.

- An opportunity for sustainability. The mobilisation of an effective, high-quality service with affordable spectacle supply is a sustainable business opportunity for the NGO, private and government sectors.

Targeting uncorrected refractive error: Countdown to 2020

- Extensively scaling up current provision of eye care services, especially through Vision Centres
- Offering refractive error services at the community level, especially in outreach and underserved city areas
- Dramatically increasing the number of personnel for refractive error services
- Expanding school screening with simultaneous eye examination, refraction and spectacle provision
- Encouraging the development of a local optical industry and facilitating the importation of low-cost spectacles when necessary

References

Glaucoma

Ravi Thomas

Glaucoma is a group of conditions with characteristic damage to the optic nerve and loss of field of vision. Glaucoma is uncommon among persons under the age of 40, but its prevalence increases with age. Other risk factors include raised intraocular pressure, a family history of glaucoma, and belonging to a susceptible ethnic group.

The two main types of glaucoma are primary open-angle glaucoma (POAG) and primary angle-closure glaucoma (PACG). POAG is more frequent in people of African origin, while PACG is more common in people of Asian origin.

Because the early stages of both types of glaucoma are usually asymptomatic, patients often present late, particularly in developing countries. Once visual loss has occurred, regardless of the type of glaucoma, it cannot be reversed. The aim of glaucoma treatment is to slow the progression of the disease in order to preserve the patient’s visual function or remaining visual function in the long term.

Prevention and treatment strategies will differ to some extent between POAG and PACG:

- POAG cannot be prevented. The management strategy involves reduction of intraocular pressure by long-term use of eye drops, application of laser to the outflow channels or surgery (e.g. trabeculectomy).
- PACG may be preventable. This involves detection of eyes at risk of angle closure by assessing the angle (drainage channels) of the eye, followed by treatment with laser (or surgery) to create an iridotomy and thereby prevent an acute attack or progression to angle-closure glaucoma. In selected cases, cataract surgery may contribute to this goal. Treatment of established PACG is similar to that of open-angle glaucoma.

All glaucomas require long-term follow-up with monitoring of the intraocular pressure, optic disc and visual field. In addition, glaucoma patients will need low vision services.

Introduction

Although glaucoma was seen as a major cause of blindness worldwide, the lack of uniform definition made it difficult to assess its impact on public health. It was suggested that 5.2 million were blind from glaucoma in 1990 and, in a 1996 study, the number of people with primary glaucoma in the world by the year 2000 was estimated at nearly 66.8 million (with nearly equal figures for POAG and PACG), with 6.7 million suffering from bilateral blindness.

Current situation

WHO estimates that glaucoma is responsible for 10% of blindness worldwide and is the third most important cause of blindness worldwide after cataract and uncorrected refractive error.

The best available data are the projections published by Quigley. An estimated 8.4 million people are blind from glaucoma in 2010 and about 60.5 million people are affected by the disease. While open-angle glaucoma is more common (44.7 million cases worldwide), angle-closure disease (15.7 million) causes more blindness and accounts for almost half of those blind from glaucoma. The projections for 2020 are that almost 80 million people will be affected by glaucoma; and while congenital glaucoma is a rare disease, the concept of ‘blind years’ is as applicable to this condition as to other causes of childhood blindness.
The approach needed to tackle glaucoma is more complex than that needed for cataract and other VISION 2020-listed diseases. The techniques essential for early detection and diagnosis of glaucoma, such as gonioscopy and optic nerve head examination, are not routinely taught in many developing-country training programmes and are not used in routine care either.\(^5\) In addition, while data on the effectiveness of intervention for glaucoma is available, from a public health perspective the only practical treatment is filtering surgery – because availability, cost, or poor compliance prohibit effective long-term treatment with eye drops. Trabeculectomy is rarely taught effectively in residency programmes and, unlike cataract surgery, requires intensive postoperative care and has more potential complications. Accordingly, confirmation of a functional defect by perimetry is necessary prior to surgical intervention. Finally, glaucoma care will be necessary throughout the patient’s lifetime.

**Successful strategies**

There are no global data for achievements in the fight against visual impairment due to glaucoma. In addition, over the past ten years, there have been relatively few attempts in developing countries at establishing comprehensive eye care programmes in the community that include management of glaucoma. However, there are several reasons to be optimistic:

- Primary angle closure can be treated and angle-closure glaucoma prevented or arrested by laser iridotomy.
- In appropriate cases, cataract extraction itself can also be a cure for angle closure. Skills in cataract surgical procedures are already in place and the laser required (Nd Yag laser) is the same as that used for posterior capsulotomy.
- A relatively inexpensive frequency doubling perimeter has shown promise in the detection of functional defects from any cause and is also useful in the demonstration of visual field defects prior to surgical intervention.\(^6\)

In recent years a great deal of research has been devoted to the natural history, detection, and management of glaucoma. A number of high-quality randomised clinical trials have validated the efficacy of IOP lowering as a treatment and investigated the best method of achieving this. The search for a simpler surgical intervention is also gaining momentum.

Additionally, there are some indications that low- and middle-income countries have made progress with the development of comprehensive eye care services and blindness control programmes. For instance, the comprehensive eye care model at LV Prasad Eye Institute, in India, incorporates glaucoma detection. In Africa, where POAG is the main form of glaucoma, there have already been a small number of pilot studies.\(^7,8,9\) China, which has a high prevalence of angle closure, is developing plans for the control of blindness. This is an opportunity not only for refining models, but also for researching the effectiveness of various approaches to glaucoma care: lasers, cataract and combined surgery.

**Challenges remaining**

The challenges facing glaucoma management are the following:

- **Training staff for the detection and treatment of glaucoma before setting up initiatives.** Regrettably, in some countries, detection and management of glaucoma are not routinely taught or practised even in residency training programmes.\(^10,11\) The cataract-dominated approach to blindness prevention is partly responsible for this state of affairs in some settings and needs to be revised.\(^10\) Current surgical intervention for glaucoma has significant potential for morbidity; therefore, before undertaking any widespread intervention, it is crucial to train personnel in glaucoma diagnosis, demonstration of functional defects and safe filtering surgery.
Identifying opportunities for the routine detection of glaucoma. The low prevalence, lack of a simple diagnostic test, and lack of simple treatment indicate that population-based screening for glaucoma is not a viable strategy. Eye care professionals need to ensure early case detection during the course of routine examinations for other complaints. Fortunately, a comprehensive eye examination will also detect all the diseases listed by VISION 2020.

Integrating glaucoma care with other ophthalmic care. The logistics of detection and management of glaucoma is complex and cannot be approached in isolation. To achieve any degree of success, glaucoma care must be integrated with comprehensive eye care. This also means that basic equipment should be made available where appropriate.

Collecting data on prevalence, availability, use, and effectiveness of glaucoma services. In particular, the monitoring of interventions for glaucoma must use visual outcomes rather than the number of cases diagnosed or a simple surgical rate to define success.

Conducting further research. There is an urgent need to research effective population-based strategies for glaucoma management. It seems that case detection at the primary and secondary centre level of the pyramidal model of eye care can detect more glaucoma. The best approach to treating such cases (medical, laser, primary surgery), the eventual impact on blindness, and the cost of achieving this are unknown and need further study.

Increasing awareness of visual loss due to glaucoma. The lay public needs to be made aware that glaucoma does not cause any symptoms until late in the disease. We must emphasise the need for routine eye examinations to detect potentially blinding conditions, including glaucoma. Those with a family history of glaucoma or ethnic predisposition must be specially targeted for education. Emphasis should be placed on the fact that there is a type of glaucoma which, if detected early enough, can actually be prevented.

Targeting glaucoma: Countdown to 2020

- Teaching and practising comprehensive eye care examination
- Diagnosis by routine case detection rather than population-based screening
- Initiating glaucoma programmes only once diagnostic skills and surgical training are in place
- Integrating glaucoma care into existing eye care initiatives
- Reporting visual outcomes and complications of surgical interventions, rather than simply the number of operations

References

Age-related macular degeneration

Age-related macular degeneration (AMD) is the leading cause of blindness in industrialised countries. The disease affects the macula – the part of the retina responsible for clear, central vision needed for detailed tasks such as reading and recognising faces – and causes progressive loss of vision. It usually affects persons over the age of 50.

There are two forms of AMD: ‘wet’ and ‘dry’ AMD. In most populations, the dry form is more frequent, but it is less likely to lead to severe bilateral vision loss. In the most severe (although less common) ‘wet’ form of the disease, without treatment, people experience serious vision loss. Options for prevention are currently limited, but new treatments are being developed which can control vision loss in some patients with the wet form and in some cases produce an improvement in vision. However, the price of these treatments remains high. There is no effective treatment for dry AMD so far.

Introduction

Ten years ago, awareness levels of AMD were alarmingly low all over the world. In 1999, according to reports, the highest awareness levels were in the United States, but, even in that country, only 25% of the people surveyed were familiar with AMD.¹ Other studies at that time indicated awareness levels were at 2% in Germany, 10% in the United Kingdom, 4% in France and 4% in Spain.²,³

Current situation

The most recent estimates indicate that AMD is responsible for 3 million cases of blindness and accounts for 7.1 % of all blindness⁴ (this proportion ranges from close to 0% in Sub-Saharan Africa to 50% in industrialised countries⁵). AMD is the fourth most important cause of blindness worldwide, after cataract, uncorrected refractive error, and glaucoma.⁶ The numbers of people developing AMD are likely to rise, as it is predicted that, by 2025, there will be twice as many older people worldwide as there were in 2000 (an increase from 606 million to 1.2 billion).⁶

Inclusion of AMD in the list of VISION 2020 priority diseases has been critical in raising awareness and emphasising the seriousness of the disease to the general population.

Successful strategies

- Increasing awareness of AMD. Thanks to aggressive outreach campaigns – such as patient symposia, public service campaigns, viral marketing (reproducing ‘word of mouth’ on the internet or by email), and media relations – awareness levels have improved all over the world. In some countries, levels have increased dramatically. For example, in the United States, results of a survey conducted in 2007 reported that 7 in 10 people were now familiar with AMD.⁷ In Australia, a report by the Macular Degeneration Foundation has shown that awareness levels rose from 47% in 2007 to 72% in 2009.⁸ In many other countries in Europe and Asia, levels are improving, but more work is clearly needed. Increased awareness amongst politicians and public health professionals has also led to improvements in the availability of treatments and put AMD on the public health agenda.
• **Increasing awareness of risk factors.** Smoking is an established risk factor for AMD and tobacco control should be strongly advocated as a measure for the prevention of blindness. For example, in Australia, some cigarette packets display a prominent warning saying: ‘Smoking causes blindness’.9

• **New treatment options slowing the progression of AMD.** While there is currently no cure for AMD, there are prevention strategies as well as therapies available that can slow the disease or even restore some vision. For certain patients with ‘dry’ and ‘wet’ AMD, taking a specific formulation of antioxidants and zinc may slow the progression of the disease.10,11 Healthy lifestyle choices can also greatly influence the course of the disease. For patients with wet AMD, new treatment strategies have been demonstrated to be beneficial in the active ‘wet’ form of AMD (vascular endothelial growth factor blocking agents); they can help stop the progression of the disease and, in some cases, restore some vision.12 The cost of these new treatment options, however, remains prohibitively expensive in low- and middle-income countries.
Challenges remaining

- **Increasing awareness and concern about AMD.** Increased awareness of AMD is essential. Ongoing outreach campaigns must include messages regarding the seriousness of the condition to motivate people to have regular eye examinations and make informed lifestyle choices (particularly in relation to healthy eating, smoking, and exercise) to reduce the risk of vision loss from AMD. Even in a country such as the United States, where awareness levels are high, concern about the disease is still very low. A survey commissioned by AMD Alliance International showed that 29% of those at risk and 36% of those at high risk mentioned AMD as the least concerning condition. This is no longer just an issue for high-income countries. AMD is likely to become a more significant public health issue in emerging industrialised economies due to increased life expectancy and higher levels of smoking. AMD should be integrated into national public health plans throughout the world.

- **Addressing modifiable risk factors for AMD.** Smoking is a proven risk factor for AMD. Public health campaigns to reduce smoking, driven by the link to other diseases as well as AMD, will reduce the risk burden. Currently, there are more than one billion smokers in the world and tobacco consumption in developing countries is steadily increasing. According to WHO, more than 80% of smokers worldwide live in low- and middle-income countries.

- **Ensuring early detection and access to treatment options and/or low vision services.** In high-income countries, increased awareness amongst politicians and public health professionals has led to improvements in the availability of treatments. Early detection is crucial to accessing treatment options. It is also important because it helps people to adjust gradually to their vision loss and make the most of their remaining vision with the help of vision aids. If patients access low vision rehabilitation early, and particularly if they receive counselling, they are much more likely to learn to cope with their vision loss and remain independent longer.

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**Targeting AMD: Countdown to 2020**

- Increasing awareness of AMD amongst the general public, health professionals and policy-makers
- Reduction in tobacco consumption, as smoking is a proven risk factor for AMD
- Early detection for early access to low vision rehabilitation and treatment options

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**References**

Diabetic retinopathy

P. Namperumalsamy

Diabetic retinopathy (DR), a microvascular complication of both type 1 and type 2 diabetes mellitus, has become one of the leading causes of blindness worldwide. Clinical trials have shown that good control of diabetes and associated hypertension and hyperlipidaemia (elevated levels of lipids in the blood) significantly reduces the risk for diabetic retinopathy.

DR is asymptomatic in its early stages. Once vision loss has occurred, it usually cannot be restored, although some forms of DR can be treated by vitreo-retinal surgery. Blindness due to DR is, however, preventable and screening programmes should detect DR at a stage at which treatment can prevent vision loss. Prevention of blindness due to DR is based on good blood glucose control, early diagnosis, regular follow-up and treatment whenever required, as well as health education programmes.

Current situation

According to the most recent WHO estimates available, DR is responsible for 3.9% (1.8 million) of the 45 million cases of blindness worldwide.\(^1\) The condition is a leading cause of new onset blindness in many industrialised countries and is an increasingly frequent cause of blindness elsewhere. The proportion of blindness due to DR ranges from close to 0% in most of Africa to 15–17% in the wealthier regions of the Americas, Europe and the Western Pacific.\(^2\)

We are currently experiencing a global epidemic of diabetes. It has been estimated that there were 171 million people worldwide with diabetes mellitus in 2000 and that at least 366 million people will have diabetes mellitus by 2030 (see Figure 1).\(^3\) This increase will be due mainly to increases in low- and middle-income countries. About 50% of people with diabetes are unaware that they have the condition and more than 75% of patients who have had diabetes mellitus for more than 20 years will have some form of retinopathy.\(^4\)

Figure 1: Estimates for the number of persons with diabetes in 2000 and projections for 2030\(^3\)

In view of its increasing prevalence throughout most of the world, a WHO working group has recommended public health interventions for the control of DR.\(^5\)
The management of vision impairment due to DR raises complex issues for health care systems: DR is asymptomatic at the treatable stage, laser treatment is usually available only in major cities, few ophthalmologists are trained to treat DR both medically and surgically, and the effective management of DR requires the existence of, and long-term coordination with, adequate services for patients with diabetes.

In spite of these obstacles, diabetic retinopathy projects are being implemented in India and in other developing countries with support from INGOs. For instance, Aravind Eye Care System has been associated with the development of several DR initiatives in India and has replicated its DR model in China; it has also developed a low-cost laser machine for the treatment of diabetic retinopathy. A model has been developed for comprehensive DR services; this is now a publication of VISION 2020 India.6,7 A structured training programme has been provided for general ophthalmologists on laser treatment for DR in India, Australia, and the United Kingdom.

Several exciting developments are taking place today in the treatment of diabetic retinopathy, especially in pharmacotherapy: e.g. the use of intravitreal steroids for diabetic macular oedema and of anti-VEGF (vascular endothelial growth factor) drugs in the treatment of diabetic retinopathy.

Successful strategies

- **KAP studies to evaluate awareness.** Knowledge Attitude and Practice (KAP) studies are recommended to understand the level of awareness, beliefs and practices about diabetes and diabetic retinopathy, to develop health education materials and strategies, and to demonstrate the success of awareness initiatives. For example, a study conducted among paramedical personnel in Southern India showed that over 75% of respondents were not aware of either laser or surgery as an intervention for retinopathy.8

- **Increasing awareness of DR in the community and amongst professionals.** Posters and pamphlets on diabetes and DR, in local languages, can be displayed in primary health care centres, hospitals, and diabetic clinics to create awareness in the community. Seminars and guest lectures can be organised for physicians and paramedical personnel, as well as NGOs. World Diabetes Day is also a good opportunity to organise fairs and seek media coverage.

- **Screening for DR in the community.** In India, which has the largest diabetic population of any nation in the world, successful strategies have been developed to deal with the problems of diabetes and DR in the community, with the active involvement of INGOs, eye NGOs and eye care institutions. Aravind Eye Care System is employing two types of screening camps in the community: one for diabetes detection followed by DR screening in the general population and the other for DR screening amongst patients known to have diabetes. Methods of screening for diabetic retinopathy include direct and indirect ophthalmoscopy.

*Mobile screening van for diabetic retinopathy*
Telemedicine. Telemedicine is also being used successfully in low- and middle-income countries to screen for DR. In India it is used at two different levels: by placing a non-mydriatic fundus camera in the diabetologist’s office and sending the resulting images to an ophthalmologist through a web-browser based software, or by deploying DR screening technicians in a mobile van with a satellite connection to rural areas or physicians’ offices. Other countries have developed different remote diagnosis models for DR screening. At present, some communities have poor or even no access to ophthalmologic care. In these settings (e.g. in some districts in Fiji), remote interpretation of film-based or digital photographs of the retina is being used.

Challenges remaining

- **Increasing awareness of DR through health education.** Awareness is still insufficient, not only amongst the lay public, but also amongst health professionals. Medical practitioners and paramedical personnel must be aware of the importance of good control of diabetes and of the need for annual fundoscopy of all diabetics to detect early retinopathy before the onset of vision loss.

- **Screening known diabetic patients.** At present, most diabetic patients consult an ophthalmologist only after experiencing considerable vision loss. Their first point of contact is the diabetologist or physician who manages their diabetes and related general complications. It is therefore important to screen all “known diabetic patients” for DR at this primary point of contact. Fundus examination should become a part of the periodic evaluation of every individual with diabetes mellitus.

- **Increasing the availability of services for diagnosis, treatment and follow-up of DR.** The infrastructure for treating DR both medically and surgically should be improved. This service can be offered either at diabetic/health centres or at ophthalmic centres, as appropriate. Ophthalmologists should be trained to competently deliver laser treatment. In addition, adequate equipment needs to be available and affordable.

- **Ensuring better coordination between eye care personnel and health personnel involved in the care of patients with diabetes.**

### Targeting diabetic retinopathy: Countdown to 2020

- Strict control of blood glucose level and other risk factors like high blood pressure and high cholesterol
- Screening every diabetic patient for DR, using fundus photography
- Promotion of patient, community, and professional awareness about diabetes and vision loss
- Improved infrastructure for both medical and surgical treatment of DR
- Effective use of information technology for both detection and referral

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Trachoma

Chad MacArthur

Trachoma is the leading infectious cause of preventable blindness in the world. The disease is strongly associated with poverty: it affects communities that have poor access to clean water supplies, sanitation, and health services. Trachoma is a chronic inflammation of the conjunctiva lining the eyelid caused by *Chlamydia trachomatis*. It occurs primarily among children aged 1–9 years old. Infection is transmitted from person to person through contact and by eye-seeking flies.

Repeated infections lead to scarring of the conjunctiva and the eventual turning-in of the eyelid (which causes the eyelashes to rub against the eye itself). This painful condition, called trichiasis, will eventually abrade the cornea and result in irreversible blindness. Children are the main reservoir of active infection, while blindness due to the consequences of chronic infection occurs in young adults and in middle-age persons.

Blindness can be prevented by eyelid surgery to prevent the lashes from rubbing against the eye; the infection and its transmission can be reduced with antibiotics, facial cleanliness and environmental change (the SAFE strategy).

Introduction

According to estimates for 1990, trachoma accounted for 15.5% of the 38 million blind worldwide. The introduction by the WHO in 1987 of a simplified grading system for trachoma facilitated the identification of priority areas for disease control. However, trachoma control represented quite a challenge in endemic communities, which partly explains why it generated relatively little public interest: before the introduction in the late 1990s of azithromycin as a single-dose treatment for trachoma, the disease had to be treated by a twice-daily application of a tetracycline ointment for six weeks – making it difficult to achieve community-wide compliance.

Current situation

According to the most recent figures, trachoma is responsible for 2.9% of global blindness. WHO estimates that 40.6 million people in 57 endemic countries are infected with trachoma and that 8.2 million suffer from the disabling pain of trichiasis and are at immediate risk of blindness. Of these 8.2 million, the majority are women; women are almost twice as likely to develop trichiasis as men. The economic impact of trachoma is estimated at USD 2.9 billion yearly in lost productivity.

Trachoma is one of the target diseases of VISION 2020, but the real impetus behind trachoma control work is the WHO Alliance for the Global Elimination of Blinding Trachoma (GET 2020), which was established in 1997. Since GET 2020 began, progress has been made to not only control trachoma, but to eliminate it as a cause of blindness.

As the target date for eliminating blinding trachoma approaches, there is great reason for optimism. In 2006, Morocco announced that it had met the WHO thresholds for elimination and in 2009, at the annual GET 2020 meeting, Ghana, Mexico, Oman, and Saudi Arabia reported similar results. A number of other endemic countries, such as Nepal, The Gambia, Mali, and Niger are approaching their target dates for elimination and have indicated that elimination of blinding trachoma as a public health problem is achievable.
Successful strategies

- **GET 2020 and SAFE.** One of the most significant steps has been the establishment, under the leadership of WHO, of the WHO Alliance for the Global Elimination of Blinding Trachoma by the year 2020 (GET 2020) and the endorsement of the SAFE strategy. SAFE is a four-pronged, integrated, public health approach that embraces both the prevention and treatment of the disease. Its four components are: Surgery to correct trichiasis; Antibiotics to treat the infection and also to limit transmission; Face-washing to rid the face of ocular and nasal discharge which attracts the flies that transmit the disease; and Environmental improvement to increase access to water and sanitation services. The ‘F’ and the ‘E’ components, along with related initiatives aiming to change behaviour, are the elements that will sustain control and elimination efforts.

GET 2020 was established to support endemic countries’ efforts to implement the SAFE strategy; it is open to members of all sectors willing to work with governments to achieve national GET 2020 elimination goals. Members include national governments, WHO, NGOs, research institutions, foundations, and pharmaceutical companies.

- **Donation of azithromycin and the International Trachoma Initiative (ITI).** Another critical factor in trachoma control has been the donation by Pfizer, Inc. of the drug azithromycin (Zithromax®). Since 1999, over 150 million doses have been donated through the International Trachoma Initiative (ITI). ITI was founded in 1998 by Pfizer and the Edna McConnel Clark Foundation, in recognition of the need for an INGO dedicated solely to the elimination of blinding trachoma. Azithromycin has proved to be highly effective when given for trachoma control, not only in reducing prevalence of trachoma, but also in reducing overall child morbidity; it has also been shown to reduce child mortality.\(^6\)

Intervention with the SAFE strategy, including use of Pfizer-donated azithromycin, has enabled Morocco and Ghana to reach the point where they met the WHO guidelines for having eliminated trachoma as a blinding disease. Over the coming years, as we head towards 2020, the number of countries receiving azithromycin and the amount of drug donated will be significantly scaled up.

- **Increased funding for NTDs.** Another significant development in trachoma control has been increased bilateral funding – particularly from the United States Congress through USAID, starting in 2006 – for neglected tropical diseases (NTDs), with a focus on preventive chemotherapy. Access to NTD funds has dramatically increased the resources available to national programmes for the ‘A’ component of the SAFE strategy and enabled a rapid scaling-up of azithromycin distribution in a number of African countries, such as Burkina Faso, Mali, and Uganda. It has also facilitated further epidemiological mapping of trachoma in areas lacking up-to-date data.

Through the SightFirst program, Lions Clubs International Foundation has provided more than USD 343 million in funding for Lions clubs worldwide to develop eye care systems in underserved communities. One way Lions fight blindness and vision loss is through increased education and awareness of eye diseases. In Ethiopia, Lions are educating the community on the SAFE strategy. Twice annually Lions support MalTra, a week-long initiative to provide 5 million treatments for malaria and trachoma while educating the community on methods to help prevent the spread of the disease.
Challenges remaining

- **Unmapped areas in endemic countries.** There are still large areas within endemic countries that remain unmapped and in which trachoma control programmes are yet to start. Having sound epidemiological information for all endemic districts will enable the strategic management of limited resources and will allow closer tracking of the progress towards the year 2020.

- **Certification guidelines.** It is hard to know when to stop intervening in countries approaching elimination. WHO is in the process of finalising guidelines for certifying a country free of the disease as a ‘public health problem’, as elimination of blinding trachoma neither aims to eradicate the causative organism nor the mild clinical manifestations of infection.

- **Implementing all aspects of the SAFE strategy.** Ensuring the implementation of the full SAFE strategy is essential to sustain the gains made. However, the behaviour change that underlies improved hygiene and latrine utilisation is a long-term undertaking and it is often overlooked in favour of the more expedient mass drug administration. Ensuring access to water and adequate sanitation falls beyond the control of most organisations currently engaged in eliminating blinding trachoma; forming partnerships with groups that work in these areas will be critical.

- **Reducing the backlog of trichiasis cases.** The backlog of trichiasis cases is currently estimated at eight million and often affects the poorest of the poor. Reaching those that live ‘beyond the end of the road’ is a major challenge. Mobilising trichiasis surgeons, and ensuring proper instrumentation and a consistent supply of consumables, will be necessary to reduce this backlog. Providing adequate post-operative follow-up and reducing the recurrence rate of trichiasis are other challenges that must be overcome to prevent blindness from trichiasis.

- **Monitoring recurrence of the disease.** Additionally, as countries begin to reach the targets set for elimination, surveillance systems will need to be established to monitor successes and to trigger a quick reaction if disease recurrence is detected.

**Conclusion**

The elimination of trachoma as a cause of blindness is a complex undertaking, requiring partnerships between governmental and non-governmental organisations, and the public and private sectors. With only ten years left to achieve the GET 2020 and VISION 2020 goals, there is still much work to be done; but with strong national leadership, good management and results-oriented planning, success is possible.

**Targeting trachoma: Countdown to 2020**

- Continued support for GET 2020 activities
- Sound epidemiological information for all endemic districts
- Increasing the number of endemic countries with actionable national trachoma control plans
- Scaling up the donation of azithromycin
- Tackling the backlog of trichiasis surgery cases
- Forming partnerships to fully implement the ‘F’ and ‘E’ components of the SAFE strategy

**References**

Onchocerciasis
Adrian Hopkins

River blindness or onchocerciasis is a parasitic disease caused by the filarial worm *Onchocerca volvulus* and found along river valleys in Africa and some Central American countries. The disease is transmitted by a small ‘black fly’, of which the most common species is *Simulium damnosum*, and which needs well-oxygenated water for the development of its larvae. In addition to eye complications and blindness, onchocerciasis causes a range of manifestations, such as nodules and skin rashes.

People have to be constantly exposed to the disease for blindness to develop. It is often the young adult population with young families who are affected. It has been shown that patients who have become blind have their life expectancy reduced by around 8–10 years. Livelihood is also affected: in the past, entire villages moved from fertile river valleys onto dry and less productive land in order to avoid the disease.

**Introduction**

Onchocerciasis was originally found principally in Africa; the most blinding form of onchocerciasis occurred in the Sahel and savannah regions of Sub-Saharan Africa, although the disease was also quite widespread. In Africa, before the distribution of ivermectin began in 1987, it was estimated that just over 100 million people were at risk of the disease, 300,000 were blind and approximately twice this number visually impaired. It was estimated that there were 40,000 new cases of blindness annually. With current treatment, these figures have been considerably reduced.

Other smaller foci of the disease were found in Latin America and the Yemen. In Latin America, the disease was found in six countries in well-defined foci and was probably brought to the area by the slave trade. In the Yemen, the disease was found in a skin form only.

Although the ocular effects of the disease had been described in the 1930s, treatment remained a problem. The only available drugs that killed the parasite were also toxic: diethylcarbamazine created severe inflammatory response in the eye, often provoking more severe visual impairment.

In 1974, the first regional control programme began in West Africa (Onchocerciasis Control Programme or OCP) and the strategy adopted was vector control. Vector breeding sites were treated, so that there were no flies to transmit the disease during the lifespan of the adult *Onchocerca*. This was a highly effective but costly programme. In 1987, Merck & Co, Inc. developed a new drug for river blindness called ivermectin (Mectizan®). Realising that the people who most needed the drug were amongst the poorest in the world, Merck decided in 1987 to donate the drug to as many who needed it for as long as was needed. Ivermectin distribution was then included in the OCP strategy in West Africa from 1988 onwards, but the donation also stimulated other NGDOs working with governments to treat other foci of the disease in Central and East Africa, as well as in Latin America. Further regional programmes evolved in the mid 1990s; the African Programme for Onchocerciasis Control (APOC) was created in 1995 and the Onchocerciasis Elimination Programme for the Americas (OEPA) in 1992.

Ivermectin has to be taken at least once a year. OEPA scaled up to twice yearly treatments with a view to eliminating the disease. In Africa, because of the widespread nature of the disease, the target was set for controlling the disease as a public health problem.
Current situation

The coordination of programmes in the 1990s and the different strategies adopted have had a major impact not only on the populations concerned, but also on health care for the most remote populations, living at the end of the road.

OEPA’s strategy of twice-yearly ivermectin with close follow-up of the population and regular parasite and vector studies has achieved major successes, including the elimination of transmission in some of the foci. OEPA is aiming to eliminate the disease in all of the Americas by 2012. Already no new cases of blindness have been reported and ocular morbidity is found only rarely in a few areas. In Latin America, the total at-risk population currently under treatment is half a million.

In Africa, where it was thought that onchocerciasis could not be eliminated, studies show that the disease has been eliminated in parts of West Africa and the situation is looking very promising for other areas after 14–16 years of treatment. The control programme has been extended to all 30 endemic countries. Scaling up has been achieved in many parts of Africa already, with a goal to potentially eliminate onchocerciasis from East and West Africa by 2020, but the conflict and post-conflict countries of Central Africa remain a challenge.

Successful strategies

● **Partnerships.** The West African Programme (OCP) was a partnership between countries and various UN organisations, including the World Bank which handled a trust fund created by various donor countries. NGDOs soon got together with WHO to coordinate their ivermectin distribution programmes, and joining with the OCP partners to form APOC. OEPA was a programme based on partnerships with countries, and eventually coordinated under the Pan American Health Organization. Each of the partners in these organisations brings different elements to the table: political will and health ministry policies, funding, technical assistance, community approaches, etc.

● **Community approaches.** Treatment with ivermectin is long term (20 years), which requires ongoing commitment. With community-directed treatment with ivermectin (CDTI), the communities, once empowered, are able to organise their own treatment. This has been the real success of the APOC programme. Ivermectin distribution using this approach has not only scaled up treatment to over 60 million people, but has stimulated other primary health care interventions using the same approach (e.g. vitamin A distribution, bednets, etc.).

● **Operational research.** One major element of the programme has been to conduct research on all major issues and to base policies and strategy on the results of operational research.
Challenges remaining

- **Maintaining treatment levels (funding and priorities).** Although transmission has been temporarily halted in some areas, programmes will need to continue ivermectin distribution to prevent recurrence. This requires ownership by countries concerned and ongoing financial and technical commitment from partners. All that has been achieved must not be lost.

- **Elimination in Africa.** New strategies will need to be developed for elimination (rather than control of onchocerciasis as a public health problem). These will include the redefinition and mapping of transmission zones for the disease, and therefore probable extension of treatment areas, possible changes in treatment frequency (from once to twice a year), and possible different strategies in different bio-geographical areas where there are differences in the parasite and the vector. In addition, criteria will need to be established for elimination in Africa, as well as the necessary diagnostic tools.

- **Loa loa co-endemicity.** The areas of co-endemicity cover the rainfall forest areas of Central Africa. This is currently the biggest problem for the elimination agenda, particularly now in the Democratic Republic of Congo. Where people exhibit high microfilarial loads of the parasite Loa loa, there is a risk of encephalopathy following treatment with ivermectin. This requires competent and timely medical care. Some strategies have been developed by APOC, but scaling-up will take more efforts.

- **Working in conflict and post-conflict systems.** A large part of Central Africa, where there has been recent armed conflict, suffers from a lack of competent human resources and suitable infrastructure.

- **Maintaining focus within the Neglected Tropical Diseases (NTDs) agenda.** Whereas mass drug administration has been established for some rapid impact NTDs, care must be taken that specifics relating to onchocerciasis are not lost, e.g. the importance of maintaining whole population coverage where treatment for other NTDs is aimed at children. Platforms for short interventions (3–5 years) may not be suitable for the long-term treatment of onchocerciasis.

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**Targeting onchocerciasis: Countdown to 2020**

- Ongoing commitment to ivermectin treatment
- Strong partnerships and ownership of programmes
- Paradigm shift from control to elimination in Africa
- New strategies for areas with Loa loa co-endemicity
- New strategies for conflict/post-conflict areas

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Blindness in children

Clare Gilbert

Although the number of children who are blind in the world is considerably smaller than the number of adults who are blind, children have a lifetime of blindness ahead of them. The main preventable causes of blindness in children are: corneal scarring from vitamin A deficiency disorders (VADD), measles infection, conjunctivitis of the newborn, and the use of harmful traditional eye medicines. Both VADD and measles are also important causes of mortality in children. Treatable conditions include cataract and retinopathy of prematurity. Childhood cataract can run in families or be due to rubella infection during pregnancy, but in most cases the cause is not known. Surgical management of cataract is much more complex in children than in adults and long-term follow-up is essential. Unavoidable causes of blindness in children include structural defects of the eye present since birth (e.g. microphthalmos), retinal dystrophies, which are often familial, and lesions of the optic nerves and/or brain, which can be caused by a range of conditions.

Introduction

Ten years ago, WHO estimated that there were 1.4 million blind children worldwide, almost three quarters of whom were living in low- and middle-income countries. A much clearer idea of the patterns of causes of blindness in children was emerging. In particular, retinopathy of prematurity (ROP) was recognised as an important emerging condition in Latin America and other middle-income countries. Major global public health initiatives initiated in the 1980s, such as vitamin A supplementation and measles immunisation, were beginning to have an impact in developing countries – not only on child mortality, but also on blindness due to corneal scarring. At this time, however, there was very little eye care service delivery specifically for children in developing countries, with notable exceptions such as India and Pakistan. In many Latin American countries, clinicians were unaware of ROP as a public health problem.

Current situation

The total number of children aged 0–15 years has increased slightly, from 1.868 billion in 1999 to almost 1.880 billion in 2010. Despite this, the number of children who are blind worldwide has declined by around 10% over the last ten years, from 1.4 million to 1.26 million. Better measles immunisation and vitamin A supplementation programmes have undoubtedly contributed to this.

Revised 2010 estimates for the number of blind children show significant regional differences (Figure 1). China and the Other Asia and Islands region have witnessed the biggest change: blindness prevalence estimates have dropped considerably and the child population has stayed relatively stable. By contrast, in Sub-Saharan Africa, the number of blind children has increased by 31%. This is due partly to the fact that this is the only region where the child population has increased significantly; in many countries in this region, however, under-five mortality rates have increased, mainly as a consequence of the HIV epidemic.

Inclusion in the VISION 2020 priorities has provided an advocacy platform for the prevention of visual impairment and blindness in children. For example, in 2009, in the Pan-American Health Organisation’s regional priorities, control of blindness and visual impairment in children was identified as the second health priority ahead of several other emerging eye diseases. There are now many more Child Eye Care Centres, particularly in India and other countries in Asia. Many of these are training centres for paediatric ophthalmologists and other team members from developing countries. VISION 2020 has also helped to emphasise the importance of low vision and refractive services, both of which are critical to child eye health – one cannot have an effective service for children without those two elements.
**Successful strategies**

- **Improving child survival.** Child eye health has benefited tremendously from interventions for child survival, such as initiatives to provide vitamin A supplements and measles immunisation.

- **Integrating child eye care into child health programmes.** For example, in Uganda, immunisation staff were trained to identify children with eye conditions and, in addition, a community awareness campaign was conducted; this led to a great increase in the number of children presenting for assessment and treatment.

- **Using a variety of case-finding methods.** As children with cataract often present very late for treatment, finding blind children is crucial. In Bangladesh, a group of NGOs worked together to cover the whole country with a variety of methods for identifying children in need of eye care, using trained community members (key informant method), staff running community-based rehabilitation programmes, as well as door-to-door field workers. All these methods are expensive and labour-intensive, but the campaign successfully raised lasting awareness at the community level.

- **Providing child-friendly services.** Eye departments across the developing world are developing child-friendly eye units which are colourful, have safe play areas and private areas for breastfeeding. Counselling parents is also very important so that they understand the condition, its management and the need for follow-up.

- **Approaches to ensure follow-up.** Experience has shown that having a ‘childhood blindness and low vision coordinator’, who counsels parents and serves as the link between the family and the hospital, leads to improved compliance with follow-up and use of spectacles and low vision devices. Mobile phone calls to parents also helps ensure that children are brought back in a timely fashion. This method has been used at the Kilimanjaro Centre for Community Ophthalmology (KCCO).

- **Raising awareness of ROP as a treatable cause of childhood blindness.** In Latin America, programmes to address ROP have improved significantly since the launch of VISION 2020. This was largely due to professional awareness workshops which encouraged ophthalmologists to work with neonatologists and neonatal nurses. Awareness has spread further afield. Two international conferences on ROP have taken place in recent years, in Lithuania and in India, while a third meeting is scheduled for 2012, in China.

- **Training eye care teams.** Caring for the eyes of children requires a team of people with appropriate knowledge, expertise and equipment. For example, anaesthetists need to know the additional care they need to take when anaesthetising a small child. This team approach to training has been adopted in some of the training centres in India and Tanzania.
● **Accessing consumables for children.** The Global Resource Centre established by the International Centre for Eyecare Education (ICEE) in Durban, South Africa, has spectacles and vision tests for children available on line at a low cost. The Low Vision Resource Centre at the Hong Kong Society for the Blind also supplies low vision devices at low cost which can be used by children. These initiatives have had an enormous impact on improving eye care services for children.

### Challenges remaining

- **Child eye care services.** There is a need for more child eye care services, particularly in the government sector, which are able to manage all conditions of childhood, including cataract. These services need to be comprehensive and have referral pathways to education and rehabilitation services.

- **Affordable services.** The care of children needing surgery is considerably more expensive than adult cataract, because they often need general anaesthesia and prolonged inpatient stay as well as frequent follow-up, repeated spectacles and low vision devices. Ideally these services should be provided free for low-income families and their care supported in other ways, such as philanthropy or by cross-subsidy.

- **School eye health programmes.** School eye health programmes are expanding but often focus narrowly on detecting and managing refractive errors. They could also include primary eye care, presbyopic correction with screening for glaucoma for teachers, and health education. In trachoma-endemic areas, schools could be provided with ways to collect fresh water, to facilitate facial cleanliness. Likewise, schools could provide gardens, to show children how to grow and prepare vitamin A-rich foods.

- **Appropriate curricula for frontline health personnel.** Within primary eye care initiatives, appropriate curricula need to be developed for the frontline health personnel whose work focuses on mothers and children. For example, they should be able to recognise that, if the mother has noticed a white pupil, the child should be referred straight away.

- **Community development.** Child eye health needs to be envisaged and integrated within the wider context of community development. For example, education about prevention of eye diseases in children could be provided alongside micro-financing schemes for women.

### Targeting blindness and visual impairment in children: Countdown to 2020

- Services for children affordable by all who need them
- Comprehensive, not just clinical, services
- Integration of primary eye care into all child health initiatives
- Making screening and treating babies for ROP part of the salaried work of ophthalmologists, to improve coverage
- Use of school eye health programmes to promote eye health among children and their families, with teachers taking an active part

### References

5. www.iceegrc.org
Low vision

Hasan Minto

The category of visual impairment referred to as ‘low vision’ has now been replaced by ‘moderate visual impairment’ and ‘severe visual impairment’ (see page 4). However, the term ‘low vision’ remains in use in reference to ‘low vision services’. A person requiring low vision services has a residual visual acuity worse than 6/18 to light perception after treatment or with refractive correction; vision can be used to plan and execute a task, and can be enhanced with provision of low vision services, which can include training and ‘low vision aids’. In short, a person with low vision cannot have their vision totally restored, but can benefit from specialised help.

Current situation

According to the most recent estimates released by WHO, there are 269 million people worldwide with mild or severe visual impairment due to eye diseases or uncorrected refractive error.¹ Approximately 67 million of these people have irreversible mild or severe visual impairment and require low vision care.² Most of those requiring low vision services are older people and their number is likely to rise due to the increasing age of the global population. Whilst the number of children requiring low vision services is small, the corresponding burden in life years is significant.

Since the launch of VISION 2020, some key milestones have been achieved. The Asia Pacific Low Vision Workshop, held in 2001, identified key constraints and made recommendations for the development of low vision services.³ The IAPB Low Vision Working Group, which was constituted as a result of this workshop, has been guiding the development of low vision services. The IAPB Standard List for Low Vision Services, published since 2003 and widely circulated, has helped standardise practice across programmes and countries.⁴ A standard curriculum for various cadres involved in the provision of low vision care is also in the final stages of development. In the first ten years of VISION 2020, low vision services have been established in around 100 developing countries in Asia, Africa, the Asia Pacific region, and South America. However, the coverage and quality of low vision care needs to be improved. The Centre for Eye Research Australia (CERA) undertook a global mapping of low vision services. This valuable research, published in 2006,⁵ gives a picture of the current situation of low vision services. It is now known which countries have poor (≤10%) and better (>10%) coverage. The majority (80%) of countries have poor coverage.

Successful strategies

- **Making low vision devices and assessment materials available and accessible.** The Low Vision Resource Centre (LVRC) was established in 2003 at the Hong Kong Society for the Blind, under the auspices of VISION 2020. This centre procures high-quality affordable devices and assessment tests and supplies these to programmes across the world. As a result, there has been a dramatic reduction in the cost of devices. Since the inception of the LVRC in 2003, over 178,200 low vision devices and assessment tests have been shipped to over 93 countries, to 460 programmes in public and non-profit sector.⁶

- **Training national focal persons in low vision.** For the past eight years, two one-month training programmes have been organised for the Asia Pacific, African, and Eastern Mediterranean regions, bringing together scarce and scattered international expertise. Seventy-eight focal persons from 70 countries were trained, who started low vision programmes in their respective countries. These trainings, organised by the IAPB Low Vision Working Group and supported by INGOs,
Disease control | Low vision

helped catalyse capacity building and the development of low vision programmes at country level. In addition, as part of Lions Clubs’ SightFirst Programme, clinicians from 25 countries were trained in the provision of clinical low vision care.

- **Advocacy for the inclusion of low vision within the health, education and rehabilitation systems.** Some countries have demonstrated remarkable achievements in integrating low vision care into eye health and education systems. For instance, the low vision programme in Sri Lanka has made significant progress in a short span of time. Three tertiary, eight secondary low vision clinics and three low vision resource centres have been established to date.

**Challenges remaining**

- **Increasing awareness of the need for low vision services.** Suitable advocacy materials need to be developed both for professionals and consumers to bring policy change and increase awareness.
- **Insufficient resource allocation for low vision care.** Despite technical advances in the management of low vision, the volume of low vision care in low- and middle-income countries is usually inadequate in view of existing needs and coverage of low vision services is less than 5% in most developing countries.
- **Including low vision care in national programmes.** Each country should include low vision care in its national VISION 2020 programme in parallel with the development of refractive error services. It should be a clearly defined activity at primary, secondary and tertiary levels of health care.
- **Integrating low vision care into wider health and education systems.** A cross-sectoral collaboration among health, education, and rehabilitation systems can play a pivotal role in promoting a more cohesive environment for quality low vision care.
- **Increasing the availability of trained human resources to provide quality low vision care.** Outcomes of low vision interventions greatly depend on the quality of assessment, prescription and training of the person with low vision. This can only be achieved by developing and widely disseminating quality standards for low vision care and by integrating standardised low vision training into the curricula for health, education and rehabilitation professionals.
- **Generating evidence on the impact of low vision interventions.** There is a call for epidemiological and qualitative research on the need for low vision care and the impact of low vision services.
- **Physical and cultural barriers to accessing services.** Most low vision services are located in tertiary urban centres and often on premises which older persons and persons with physical disabilities find difficult to access. In addition, the use of assistive devices in public is not an accepted norm and persons with low vision are often reluctant to use this technology due to peer pressure.

**Targeting low vision: Countdown to 2020**

- Advocacy to integrate low vision care into all eye health, education and community-based rehabilitation programmes
- Integrate a low vision component into all relevant training programmes
- Develop innovative partnerships amongst health, education and rehabilitation sectors
- Epidemiological and qualitative research on the need for and impact of low vision care
- Establish and support consumer organisations/peer support groups to advocate for the rights of persons with low vision

**References**

Conclusion

Ten years in, ten years to go...

My Linh, from Phu Yen province in Vietnam was born with cataracts in both eyes. Her sight was restored thanks to the work of the Fred Hollows Foundation in Vietnam. Left untreated many children in the developing world die a few years after going blind. The Foundation works in 18 countries – carrying on the work of its founder, the late Professor Fred Hollows. In 2009 the Foundation screened 1.7 million people, and carried out 195,406 eye operations and treatments.

Picture courtesy of Tran Phuc Hanh/The Fred Hollows Foundation
The year 2010 is more or less the halfway mark for VISION 2020, the global initiative launched in 1999 with the goal to eliminate avoidable blindness by the year 2020. It is the perfect time to take stock of what we have achieved and learned, but also of what still needs to be done.

In the final analysis, the success of VISION 2020 has to be judged against its impact on reducing levels of avoidable blindness. We are awaiting the release of new WHO global prevalence data, to confirm anecdotal evidence that blindness and visual impairment are declining as a proportion of the global population.

However, much more needs to be done if we are to achieve our overall objective. The way forward will require us to build upon existing success, scale up what we are already doing, and adopt new strategies where progress has been slower than hoped.

Building upon initial success

Great progress has been made over the preceding decade:

- The numbers of children blind from corneal scarring due to vitamin A deficiency, measles, and infection have declined substantially, though the problem persists in some focal settings. Maintaining these gains requires continued promotion of vitamin A supplementation, measles vaccination, and nutritional advice – particularly in the most vulnerable communities in the world’s fragile states.

- Great progress has been made in screening and treating premature babies for retinopathy of prematurity (ROP). As the world’s population becomes more urbanised (WHO estimates that by 2050 some 70% of the global population will live in cities) and middle-income countries become more successful in reducing infant mortality, so a major scaling up of the training of neonatologists, paediatric ophthalmologists and nurses will be required to deal with ROP.

- The prevalence of blindness due to onchocerciasis continues to decline. It seems probable that the target of eliminating onchocerciasis as a disease of public health concern in Central and Latin American countries by 2012 will be achieved. Excitingly, evidence is now available that elimination may also be a reality in some African foci. However, now is not the time to take the foot off the accelerator, in the mistaken belief that this is a job done. Community-directed treatment with ivermectin (CDTI) will need continuing support, especially in those fragile African states where control measures were started late. Ongoing post-endemic surveillance, in those foci where treatment has stopped, will be needed to prevent any recrudescence of the disease.

- Another remarkable success story has been the control of trachoma, largely due to the leadership of the GET 2020 initiative. The number of people with active trachoma has been halved, from an estimated 84 million at the turn of the century to some 40 million according to data presented at the 2009 GET 2020 meeting. The number of people blind from trachoma was 5.9 million in 1995 and the latest WHO data now estimate this figure to be 1.5 million. Morocco has succeeded in eliminating trachoma as a public health problem and is now engaged in post-endemic surveillance work. In 2009, Mexico, Oman and Saudi Arabia reported similar results in eliminating trachoma. By the middle of the coming decade, it is anticipated that at least another eight countries will also be able to apply for certification from WHO that elimination has been achieved. With continual support for the SAFE strategy, particularly in those countries where progress has been less rapid, there is a real chance that by 2020 endemic trachoma will be consigned to the history books in many countries.
Eye glasses have been used to improve vision for at least 750 years, but it is only over the past ten years that the true impact of uncorrected refractive errors on the quality of people’s lives and the global prevalence of visual impairment has become apparent. Low-cost but good-quality spectacles are now available and there has been an increase in the numbers of refractionists and optometrists trained. Much good work has been done to agree training curriculum and standards. The development of the Vision Centre concept has made the provision of spectacles more accessible to the poorest rural communities. This is surely an area that demands a rapid scaling up of services over the remaining decade of VISION 2020.

Cataract, still the most common cause of blindness in the world, has been the focus of many eye care programmes, both prior to VISION 2020 and during the first decade of the global campaign. It must remain a priority: although great strides have been made in some parts of the world – in India, for example, the cataract surgical rate has increased five-fold over the past 25 years – both the low number and poor quality of cataract operations remain a major concern in many countries. The recent national prevalence of blindness survey conducted in Nigeria revealed that an astonishing 46% of all procedures for cataract had been carried out by couching – a technique which invariably results in blindness, first described by Indian physicians in the 6th century BC.

Scaling up and adopting new strategies

Many cost-effective and tried-and-tested approaches to disease control have emerged through VISION 2020. Our challenge, over the next ten years, will be to implement these approaches on a larger scale – in other words ‘scale up’, to use a popular term in development circles.

What scaling up really means in terms of international health has recently been the focus of some interesting work. One approach is to consider the barriers that are currently preventing health approaches from being taken to scale.

One very obvious area requiring our attention is increasing the financial resources available to implement national VISION 2020 plans and to bring good-quality, equitable eye health services to the poorest communities. This will require extensive advocacy work, itself based on sound evidence, to influence and change the minds of policy makers around the world, most of whom presently see blindness as a low priority. More advocacy and more targeted research to prove our case are paramount to our future progress.

However, even if we were able to increase financial resources, would countries have the capacity to absorb this funding and deliver the much-needed eye health services? Sadly, the answer is no in many countries – because of the chronic shortage of eye health workers. Human resource development for eye health must receive even greater emphasis in the second decade of VISION 2020. Training is an important aspect of human resource development, but it is only one part of a complex jigsaw that includes wider policy issues such as staff retention and motivation, deployment to rural areas, ‘brain drain’, etc.

Another important area to consider is the creation of consumer demand for eye health services. Why do so many people still turn to traditional treatments rather than seek out the eye units that VISION 2020 has so extensively promoted? The reasons are numerous and this is not the place to investigate them in detail – but equity and quality have to receive even greater attention than previously. The outcome of cataract and trichiasis surgery, for example, is unacceptable in many countries and standards of surgery have to be improved.

In terms of strategy, we will have to devote more resources to the control and treatment of diabetic retinopathy, as the global explosion of diabetes will more than double the number of diabetics in the next twenty years. Glaucoma already presents a real challenge for VISION 2020, as the third most important cause of blindness, and we must step up the integration of glaucoma care into existing eye care initiatives. Another important challenge will be reducing the cost of expensive treatments
for age-related macular degeneration and raising people’s awareness of this eye condition, which is the leading cause of blindness in developed countries.⁶

**Conclusion**

We must look for opportunities to promote VISION 2020 within the wider realm of health development. We shall need to engage everywhere, taking advantage of the reawakened interest in primary health care. The current emphasis of many of the main donor agencies is to support the strengthening of health systems – rather than fund individual vertical initiatives. At the very least, we shall need to consider how current VISION 2020 approaches align with broader health system development. The global shortage of health workers is a considerable problem extending beyond eye care – we cannot resolve our own need for more eye health personnel without taking account of initiatives such as the Global Health Workforce Alliance. We will need to forge new partnerships that take us outside the traditional comfort zone of our own profession.

Lest all this seem rather daunting we must remember that VISION 2020 has generated a substantial amount of innovation and progress. We have much to contribute to the world of health development and others can learn as much from us as we can from them.

Finally, I am reminded of an encounter between a very old, very poor man and a seasoned programme manager who had worked on VISION 2020 projects for many years. The old man’s family was destitute and he spent hours trying to persuade the programme manager that he should be supported to donate his eyes – which, at the age of 85, he didn’t think he would need much longer – to his three-year-old granddaughter who had recently gone blind. It is for that old man, his granddaughter, and the millions like them that we must all work to achieve VISION 2020.

**References**
