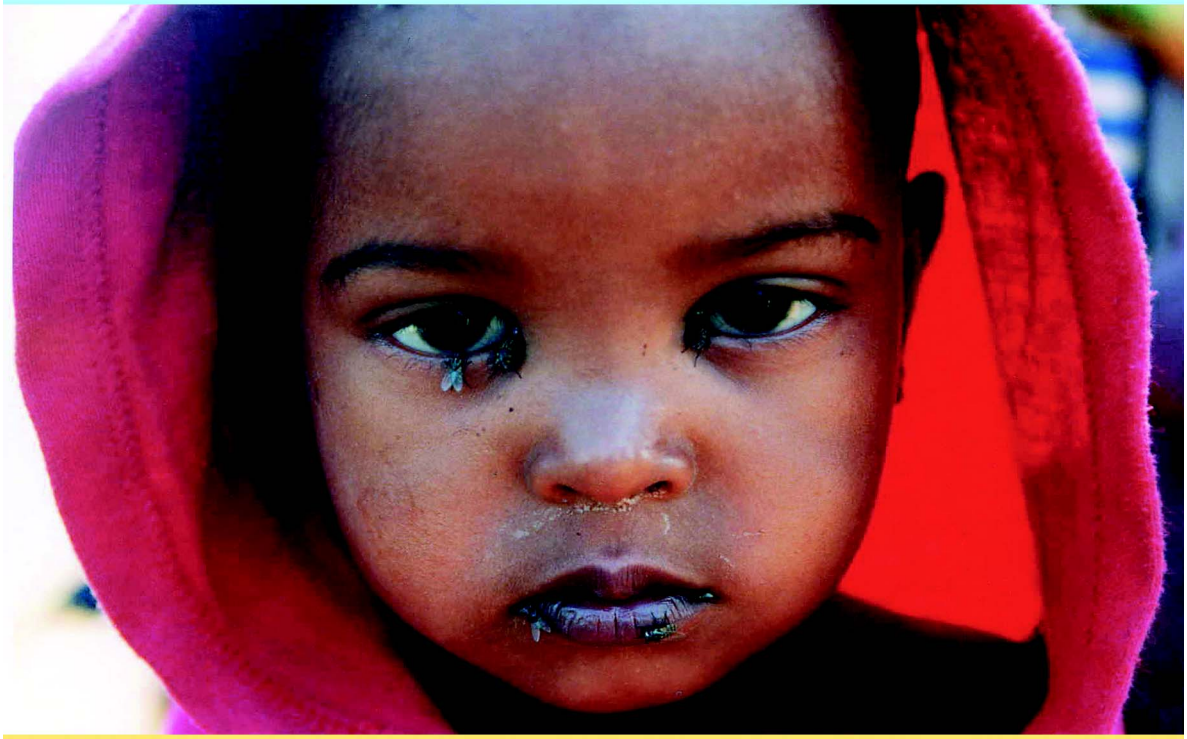
BLINDNESS, POVERTY AND DEVELOPMENT

The Impact of VISION 2020 on the U.N. Millennium Development Goals



IAPB

VISION 2020
THE RIGHT TO SIGHT

A needless problem

The number of blind people in the world is set to double over the next twenty years, despite the availability of highly cost-effective interventions. Four out of five people who will lose their sight will do so unnecessarily. It was in recognition of this unacceptable prognosis that the World Health Organisation (WHO) and the International Agency for the Prevention of Blindness (IAPB) in 1999 launched the joint initiative known as VISION 2020: The Right to Sight. This provides the programmatic framework for eliminating avoidable blindness by the year 2020. If the political will and adequate resources can be galvanised in tandem, this goal is eminently achievable.

VISION 2020 aims to eliminate the main causes of avoidable blindness by the year 2020 by bringing together governments, non-governmental agencies, eye care professionals, and other organisations involved in blindness prevention, to facilitate the planning, development and implementation of sustainable national eye care programmes. These are predicated on the three core strategies of disease control, human resource development and infrastructure development, incorporating the principles of primary health care.

The successful implementation of VISION 2020 would not only reduce individual suffering, but would also provide significant social and economic benefits.

Visual impairment brings profound economic disadvantage to individuals, their families and societies. Several recent studies have quantified these impacts. These range from the study by K D Frick and A Foster on the global economic productivity impact of avoidable blindness to a study on the economic impact of cataract surgery on individuals. All these studies demonstrate the magnitude of the economic and social returns from investments in avoidable blindness.

With 90% of blind people living in developing countries, it is not surprising that such investments make a significant contribution to the achievement of the Millennium Development Goals. In this document, we examine this contribution, and summarise the findings from a selection of studies that quantify these benefits.

The Costs of Global Blindness

(Frick K.D., Foster A. *The magnitude and cost of global blindness: An increasing problem that can be alleviated.* American Journal of Ophthalmology 2003; 135(4):471-47)

Research by Frick and Foster estimated the costs of global blindness and low vision at $42 billion in 2000. Without a decrease in the prevalence of blindness and low vision, it was projected that the total annual costs would rise to $110 billion by 2020. However, if VISION 2020 goals are achieved, this will be reduced to only $57 billion in 2020. This equates to overall global savings of US$223 billion over 20 years.

Although costs in absolute terms are highest in established market economies, the costs relative to GDP are considerably higher for low-income countries. For instance, the estimated annual GDP loss for the year 2020 without VISION 2020 interventions is 0.5% for both Sub-Saharan Africa and India.

Seven of the eight United Nations Millennium Development Goals depend on measures linked to the implementation of VISION 2020.

MDG 1 : Eradicate Extreme Poverty and Hunger

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

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

Many of the causes of avoidable blindness in low-income countries are directly related to poverty, including hunger, malnutrition and limited access to health, education, water and sanitation services. These problems are most acute in the least economically developed regions, home to more than 90% of the world's visually impaired people.

The facts

- As much as 75% of blindness is avoidable (preventable or curable).
- Of the 600 million people with disabilities worldwide, 82% live below the poverty line, 20% belong to the 'poorest of the poor' and only 3-4% benefit from development activities.
- Malnutrition affects 852 million people, leading to blindness, illness and death.

VISION 2020 recognises the poverty trap of people living with visual impairment, their likeliness of being excluded from basic health, education and social services and their consequent risk of isolation, ill health and economic exclusion.

A successful VISION 2020 initiative would mean that instead of the projected increase of 75 million blind by the year 2020, the number of blind people would be limited to 24 million. VISION 2020 seeks to ensure the best possible vision for all people by adopting an integrated approach based on priority diseases in poverty stricken areas, development of eye care facilities and training of eye care personnel; thereby contributing directly to improvements in quality of life and creating more favourable economic, social and health conditions for individuals and society at large.

The Gambian Eye Care Programme (GECP)

(Frick K.D., Foster A., et. al. *Analysis of Costs and Benefits of the Gambian eye care program*. Arch Ophthalmology 1998; 46:69-172)

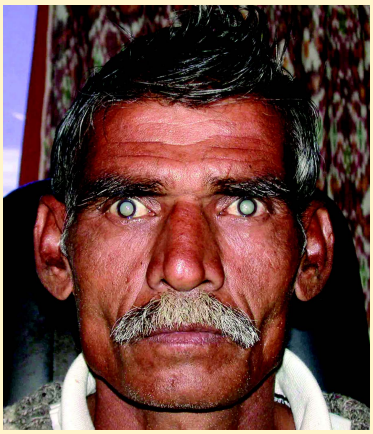
In 1987, the GECP was established, based on the principles that later informed the VISION 2020 initiative. Its main activities were:

- Cataract surgery;
- Trachoma control using the WHO- recommended **SAFE** strategy **(Surgery, Antibiotics, Facial cleanliness and Environmental improvement)**;
- Information, education and communication for, of and with the population;
- Construction and equipping of equitably distributed secondary eye-care centres and local eye drop production units;
- Annual programme reviews, five-year evaluations and ten-yearly prevalence surveys;
- Building capacity for programme management

By 1996, the Gambian population had increased by 50%, and average life expectancy had increased by 10 years. Despite these demographic changes, a repeat national survey conducted in that year showed a 40% reduction in the overall prevalence of blindness. The cost of the GECP was US $1.28 million (1995 dollars). The net lifetime benefit was estimated at US $1.01 million, yielding a 10% rate of return on investment for the Gambian population. If similar benefits were assumed for Senegalese citizens, who accounted for 30% of patients, the rate of return was 19%. And if all cases of blindness avoided resulted in increased productivity, the rate of return would be as high as 42%.

Impact of cataract surgery on individuals in India

(Javitt J.C. Cataract. Chapter 26 – Jamison D.T. et al. *Disease control Priorities in Developing Countries*. New York. Oxford University Press for the World Bank. 1993)



A survey among patients at Aravind Eye Hospital in Madurai, India, found that 85% of males and 58% of the females who had lost their jobs as a result of blindness regained those jobs following cataract removal. Some of those who did not return to work relieved other family members from household duties, enabling them in turn to return to work. 88% of male patients and 93% of female patients who reported having lost authority within their family and their community stated that they had regained their social standing. The results also demonstrated that the average individual who regained functional vision through cataract surgery generated 1,500 percent of the cost of surgery in increased economic productivity during the first year following surgery. This benefit was raised both by the patients and their family members who were able to return to work.

MDG 2 & 3: Achieve universal primary education, promote gender equality and empower women.

Target 3: Ensure that, by 2020, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling.

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

Approximately 90% of visually impaired children in low-income countries are deprived of schooling. Lack of infrastructure, affordable health care, production of accessible and suitable school materials and qualified teachers prevent visually impaired children from attending school in many low-income countries.

Blindness among adults in the family may result in decreased school attendance and performance. For instance, blind adults in many low-income countries are dependent on school-age children and other family members.

In addition, low vision and refractive error resulting from lack of early interventions reduces school performance.

VISION 2020 programmes improve access to educational and employment opportunities by using a wide range of public health interventions that enhance children's access to education and reduce hunger, malnutrition and blindness. Strategies to control blindness in children include the provision of good primary health care, and the development of models to provide affordable optical correction and low vision aids (see MDG 4). Strategies being implemented by VISION 2020 partners include vision screening in schools, screening and early intervention for retinopathy of prematurity and training in paediatric eye care. Moreover, the provision of prevention and treatment services for eye conditions reduces the hardship for families.

Moroccan National Blindness Control Programme

(Ruth Levine et. al. *Controlling Trachoma in Morocco. Millions Saved: Proven Success in Global Health,* Center for Global Development. November 2004)

In 1991, Morocco set up the National Blindness Control Programme. This partnership included the five government divisions responsible for health, education, employment, equipment, and water; international organisations; bilateral and multilateral agencies; and local Non-Governmental Organisations (NGOs). Between 1997 and 1999, the government incorporated the SAFE strategy into the National Blindness Control Program. Mobile teams performed simple, inexpensive surgeries, some 3 million doses of the antibiotic azithromycin were distributed, and health education efforts promoting safe washing and hygiene were conducted, latrines constructed and safe drinking water supplied. Access to potable water increased from 13 percent of all rural communities in 1992 to 60 percent in 2000.

With the acknowledgment that reducing poverty and improving literacy among women is central to the fight against trachoma, the government undertook interventions to improve literacy among women and implemented economic programs to increase women's incomes.

With a health programme that purposively moves beyond the health system to address broader aspects of economic development, Morocco has achieved a 75 percent drop in the prevalence of trachoma since 1999 and its complete elimination from some provinces—the most rapid progress against trachoma ever recorded in a single country.

MDG 4: Reduce child mortality

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

Up to 60% of children in low income countries are likely to die within one year of becoming blind. Moreover, around 500,000 children become blind each year. This equates roughly to one child becoming blind each minute. Many of the conditions associated with childhood blindness are also causes of child mortality (e.g. premature birth, measles, congenital rubella syndrome, vitamin A deficiency, and meningitis).

VISION 2020 programmes contribute to lowering the risk of child mortality through childhood blindness control interventions and promotion of basic public health care. Such interventions include vitamin A supplementation and trachoma control. Vitamin A supplementation has been found to be among the most cost effective of all health interventions[1]. It only takes two doses a year to prevent blindness – at a cost of approximately $1. Linking vitamin A supplementation to routine immunisation programmes and distributing vitamin A supplements on immunisation days extends coverage and many countries are adopting this approach[2].

In addition, the community based trachoma control interventions promoted by VISION 2020, including the SAFE strategy, school health programmes, women's literacy training and the training of health workers to perform surgery help empower whole communities through better sanitation, hygiene and nutrition practices. This has a direct bearing on maternal and child health, in the long term reducing under-five mortality rates.

[1] World Bank. World Development Report 1993: Investing in Health. New York: Oxford University Press, 1993

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

MDG 6: Combat HIV/AIDS, malaria and other diseases

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

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

People living with disability may be equally – or more – exposed to risk factors that lead to infectious diseases and have limited access to outreach and treatment services. Major 'neglected diseases', which include blinding conditions such as trachoma and onchocerciasis (river blindness), are endemic in rural and impoverished urban areas of low-income countries and can impair education and worker productivity.

VISION 2020 programmes to combat onchocerciasis or trachoma also contribute to reducing the impact of HIV/AIDS, malaria and other diseases on individuals and families by adopting a public health approach, in the delivery of preventive and curative eye health services and training that focuses on maternal and child health care, health education, and good nutrition.

Cost-effectiveness of Onchocerciasis control

(Waters H.R, J.A. Rehwinkel, G. Burnham. *Economic Evaluation of Mectizan distribution.* Tropical Medicine and International Health. Volume 9 No. 4 pp A16-A25 Supplement April 2004)

A study on the economic evaluation of Mectizan® distribution (the antibiotic which prevents onchocerciasis) summarises findings from several economic evaluations of the African Programme for Onchocerciasis Control (APOC) and the Onchocerciasis Control Programme (OCP). Economic evaluations of the OPCP in West Africa have calculated a net present value – including both land and labour benefits – of $485 million over a 39 year period, using a conservative 10% rate to discount future health and productivity gains. This estimate results in a programme economic rate of return of 20%.

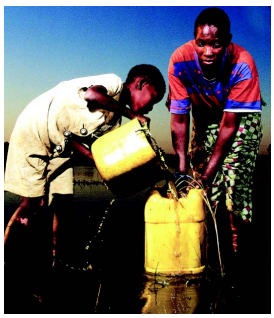
The net present value for APOC is calculated at $88 million over a 21 year time period (1996-2017), also using a 10% discount rate. The economic rate of return of the programme is estimated at 24% for the given time period.

MDG 7: Ensure environmental sustainability

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

People in low-income countries living with a disability such as visual impairment are likely to have lower standards of housing conditions and have less access to clean water and sanitation.

Facilitating access to clean water and basic sanitation is an essential component of the SAFE strategy.



MDG 8: Develop a global partnership for development

Target 16: In cooperation with developing countries, develop and implement strategies for decent and productive work for youth

The global VISION 2020 initiative promotes human resources development to deliver comprehensive eye care at the primary and secondary levels of service delivery. One programme in this area is VISION 2020 Links, through which eye care workers receive training and support to enhance their ability to contribute to prevention of blindness activities.

The VISION 2020 Links Programme focuses specifically on identified local needs and priorities and facilitates partnerships leading to solutions that are innovative, sustainable and cost-effective. A major concern is to make expertise at all levels available in a variety of modes to those who need it the most.

Target 17: In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries

VISION 2020 programmes ensure the availability of essential drugs for blindness prevention through its international, national and regional partnerships for the control of onchocerciasis, trachoma and childhood blindness.

Onchocerciasis: APOC and OEPA (Onchocerciasis Elimination Programme in the Americas) involve national governments, and affected communities of 25 participating countries, international and local nongovernmental development organisations, and Merck & Co Pharmaceuticals – committed to donating Mectizan® for as long as needed, wherever needed – to help eliminate onchocerciasis as a major public health problem.

Trachoma: The Global Elimination of Trachoma (GET 2020) initiative is a collaboration of national governments, nongovernmental development organisations, academic institutions, and Pfizer International – the pharmaceutical company that owns the patent of azithromycin, a long-acting antibiotic which is being donated to fight trachoma.

Childhood blindness: Immunisation against measles, a cause of childhood blindness, is an essential component of a typical childhood blindness prevention programme promoted by VISION 2020.

Targets 12 –15 & 18: Actions countries must take at regional, national and international level in support of MDGs 1-7.

VISION 2020's strength lies in strong partnerships at all levels

- At the international level, VISION 2020 represents a collaboration between IAPB representing over 60 international and national organisations involved in blindness prevention work and the WHO, acting on behalf of its 192 Member States.

- At the national, regional and community levels, VISION 2020 fosters a strong partnership among the Ministry of Health, international/national organisations, professional organisations, and civil society groups – brought together in a national prevention of blindness and/or VISION 2020 committee – aiming to facilitate the implementation of effective and efficient eye-care services in all districts.

CASE STUDY: Australia.
*(*Centre for Eye Research Australia. *Clear Insight: The Economic Impact and Cost of Vision Loss in Australia,* An Overview of the Report prepared by Access Economics Pty Limited, August 2004*)*

The most comprehensive national study of economic cost of visual impairment to date, predicted the indirect and direct costs of vision loss in Australia in 2004. Direct costs are those involved in the treatment of eye diseases, including costs of running medical and allied health services, costs of pharmaceuticals to treat diseases of the eye, eye research, and administration. The total direct costs of treating eye disease in Australia in 2004 was estimated at US$1.3 billion, more than the cost of managing coronary heart disease, stroke, arthritis, or depression nationally in that year.

Indirect costs include lost earnings for the visually impaired, lost earnings for their caregivers, aids, equipment, modifications to the home, rehabilitation, welfare payments, taxation revenue foregone, and the pain, suffering, and premature death that result from visual impairment. The total indirect costs were estimated at US$5.6 billion for 2004.

The years of life lost due to disability from visual disorders is 2.7% of the national total, similar to that of diabetes and coronary heart disease and significantly greater that the disability burden for breast cancer, prostate cancer, melanoma or HIV/AIDS.

Disability Adjusted Life Years (DALYs)

The DALY is a method of calculating the global disease burden in terms of the reported or estimated cases of premature death, disability and days of infirmity due to illness from a specific disease or condition. When the Disability Adjusted Life Years for specific eye diseases (Onchocerciasis, Trachoma, Vitamin A Deficiency, glaucoma, cataract and visual disorders) are added together, visual impairment ranks as the seventh leading cause of disability worldwide - following perinatal conditions, lower respiratory infection, Cardio-and cerebro-vascular diseases, and HIV/AIDS.

Burden of Disease by Cause for Eye Conditions - 2001
(Based on Global Burden of Disease & Risk Factors, Lopez et al 2006)

Disability Adjusted Life Years (3,0)					
Rank	**Cause Group**	**Low-and Middle income**	**High income**	**Total**	**%**
	Onchocerciasis Trachoma Vitamin A Glaucoma	439 2620 711 4112	0 10 1 268	439 2630 711 4380	
14	Cataract	28150	493	28643	(1.9%)
22	Visual Disorders	15364	1525	16889	(1.1%)
7	**Total (without diabetes)**	**51296**	**2297**	**53692**	

Economic burden of blindness in India

(Shamanna B.R., Dandona L., Rao GN. *Indian Journal of Ophthalmology* 1998; 46: 69-172)

In 1997 in India, the economic burden of blindness was estimated at $US 4.4 million (1.45% of the total GNP – about 72.5% of government health expenditure in that year), and the cumulative loss over the lifetime of the blind was US$77.4 million, which was in the same line of magnitude as the loss due to HIV/AIDS in India (1995 figures). Childhood blindness accounted for 28.7% of this lifetime loss.

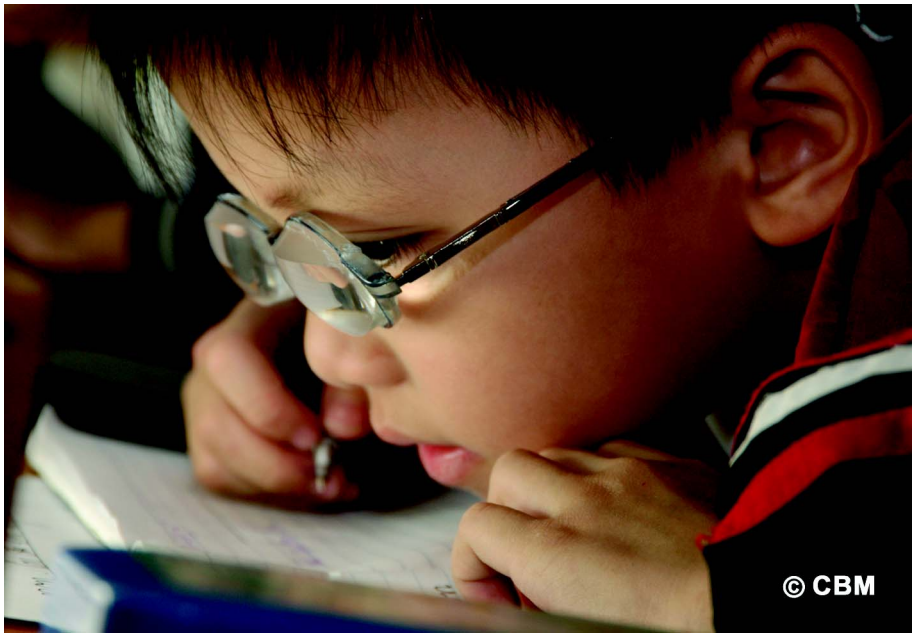
The study predicts that if the 52% of blindness in India due to cataract is treated with an investment of US$ 0.15 billion and it is assumed that 80% of those operated on are not blind after surgery and 45% of those blind from cataract are in the labour-productive age group, the savings in annual GNP would be US$ 1.1 billion. This shows that the treatment for cataract blindness is a very cost-effective intervention.

A compelling case

Investments in avoidable blindness and visual impairment yield high levels of economic and social returns, while dramatically improving the quality of life of individuals and families. Not only have economic rates of return of around 20% (on conservative assumptions) been demonstrated in the studies shown here, the absolute levels of investment required are low compared to other disease areas. In the case of the Gambia it was just over $1 per person to provide comprehensive eye care services. It would be tragic if the necessary investment is not now made to eliminate this unnecessary suffering.

The Millennium Development Goals form a blueprint for action agreed to by governments worldwide, as well as the world's leading development organisations. They have galvanised unprecedented efforts to address the needs of the world's poorest people, whose numbers include the majority of those who are unnecessarily blind.

Without the appropriate investment by governments, development agencies and other funders to support the implementation of the VISION 2020 programme, a highly focused and cost effective initiative, the full achievement of the MDGs will remain unattainable.



Definitions

(International statistical classification of Diseases, injuries and causes of death (10th revision ICD-10): http://www3.who.int/icd/) and WHO, IAPB 2005: State of the World's Sight: VISION 2020: the Right to Sight 1999-2005)

Blindness: visual activity less than 3/60 with best possible correction, or a corresponding visual field no greater than 10 degrees in the better eye (ICD -10 visual impairment categories 3, 4, 5 in both eyes).

Low vision: visual activity less than 6/18, but equal to or better than 3/60, with best possible correction in the better eye (ICD - 10 visual impairment categories 1 or 2 in both eyes). 'Low vision' is also defined as one who – after treatment and refractive correction – has impairment of visual function but who uses or is potentially able to use vision for planning and/or execution of a task.

Visual impairment: includes low vision and blindness (ICD-10 visual impairment categories 1,2,3,4, and 5);

Refractive error: is an optical defect of the eye that prevents effective focus of images. Most visual impairment due to refractive error is correctable with the use of spectacles.

Retinopathy of prematurity: occurs in premature babies with immature retinal blood vessels. Low birth weight and hyperoxia (due to use of inadequately-monitored supplemental oxygen in neonatal intensive-care units) are important risk factors.

Onchocerciasis: or river blindness, is due to an infection with the nematode worm Onchocerca volvulus.

Trachoma: is a chronic disease of the eye caused by ocular strains of the bacterium Chlamydia trachomatis. Occurs in poor, overcrowded communities with poor access to water and sanitation.

Cataract: is the opacity of the lens of the eye. It is more common with increasing age.

For further information, please contact:

IAPB/VISION 2020 Registered Office

London School of Hygiene and Tropical Medicine, Keppel Street,
London WC1E 7HT, England, UK Ph: +44 (0)20 7927 2974
http://www.v2020.org Email: communications@v2020.org