

# Blindness in Asia — the Facts



The number of blind people in the world is not accurately known, but has been estimated by the World Health Organization (WHO) to be approximately 38 million.<sup>1</sup> A further 110 million people have low vision and are at risk of becoming blind. The main causes of blindness and low vision are cataract, trachoma, glaucoma, onchocerciasis, and xerophthalmia.

When the WHO Programme for the Prevention of Blindness was established in 1978, its priority was to obtain more detailed information about blindness worldwide. A Task Force on Data on Blindness was convened and an epidemiological model for population-based blindness estimates was established. In 1993, the WHO, in conjunction with the World Bank, undertook to measure the burden of blindness.

The global burden of disease combines premature loss of life with the loss of healthy life years from disability, and is measured in units of disability-adjusted life years (DALYs).

## Global Burden of Blindness

The 229 countries and territories worldwide were grouped into 8 economic regions (as shown in table 1), and the demographic structure was taken as the population base, by country and for defined age groups.

In 1990, there were approximately 38 million blind people in the world, with a global prevalence of 0.7% (range 0.3 to 1.4%; table 2). Surveys in 17 countries showed the estimated prevalence of low vision to

be approximately 110 million. Therefore, the total burden of visual impairment (people blind or with significant visual loss) was estimated at 148 million.

The regional burden of blindness (RBB) relates to the proportion of the number of blind in a particular region to the global number of blind people, and the proportion of the regional population to the world population. Every RBB ratio greater than unity (1.00) identifies those regions where the burden of blindness is to be taken into consideration in terms of setting up priorities on a global scale. Sub-Saharan Africa, India, and 'other Asian countries and islands' have RBB ratios greater than 1.00 (table 3).

22 million blind people (58% of the global blind population) are aged  $\geq 60$  years, while only 3.8% (approximately 1.5 million) of children aged  $\leq 4$  years old are blind. Developing countries, with 58.5% of the global population aged  $> 60$  years, have 88.8% of the blindness in this age group (RBB = 1.51).

The 3 main causes of blindness in the world are cataract, trachoma, and glaucoma, which together account for more than two-thirds of the world's blindness. Cataract is the most important cause of blindness in developing countries, causing 41.8% of global blindness (table 4), while other causes such as diabetic retinopathy or macular degeneration dominate in the established market economies.

These estimates indicate that the prevalence of blindness will increase unless sufficient resources for its prevention are

**Table 1.** Distribution of countries according to economic region

| Region                               | Number of countries | Population (x 10 <sup>3</sup> ) |
|--------------------------------------|---------------------|---------------------------------|
| Established market economies*        | 35                  | 797,788                         |
| Former socialist economies of Europe | 14                  | 346,237                         |
| India                                | 1                   | 849,515                         |
| China                                | 1                   | 1,133,698                       |
| Other Asian countries and islands    | 49                  | 682,533                         |
| Sub-Saharan Africa                   | 49                  | 510,271                         |
| Latin America and the Caribbean      | 46                  | 444,297                         |
| Middle-Eastern Crescent <sup>†</sup> | 34                  | 503,075                         |
| <b>Total</b>                         | <b>229</b>          | <b>5,267,075</b>                |

\* Western Europe, North America, Australia, Japan, and New Zealand. <sup>†</sup> Plus newly independent states in Central Asia.

**Table 2.** Global distribution of blindness

| Region                               | Reference population (x 10 <sup>3</sup> ) | Number of blind (x 10 <sup>3</sup> ) | Prevalence of blindness (%) |
|--------------------------------------|---|--------------------------------------|-----------------------------|
| Established market economies*        | 797,788                                   | 2,400                                | 0.3                         |
| Former socialist economies of Europe | 346,237                                   | 1,100                                | 0.3                         |
| India                                | 849,515                                   | 8,900                                | 1.0                         |
| China                                | 1,133,698                                 | 6,700                                | 0.6                         |
| Other Asian countries and islands    | 682,533                                   | 5,800                                | 0.8                         |
| Sub-Saharan Africa                   | 510,271                                   | 7,100                                | 1.4                         |
| Latin America and the Caribbean      | 444,297                                   | 2,300                                | 0.5                         |
| Middle-Eastern Crescent <sup>†</sup> | 503,075                                   | 3,600                                | 0.7                         |
| <b>Total</b>                         | <b>5,267,075</b>                          | <b>37,900</b>                        | <b>0.7</b>                  |

\* Western Europe, North America, Australia, Japan, and New Zealand. <sup>†</sup> Plus newly independent states in Central Asia.

**Table 3. Regional burden of blindness (RBB)**

| Region                               | % of global population (A) | % of global blindness burden (B) | RBB (B/A) |
|--------------------------------------|----------------------------|----------------------------------|-----------|
| Established market economies*        | 15.1                       | 6.3                              | 0.41      |
| Former socialist economies of Europe | 6.6                        | 2.9                              | 0.44      |
| India                                | 16.1                       | 23.5                             | 1.46      |
| China                                | 21.4                       | 17.6                             | 0.82      |
| Other Asian countries and islands    | 13.0                       | 15.3                             | 1.18      |
| Sub-Saharan Africa                   | 9.7                        | 18.8                             | 1.93      |
| Latin America and the Caribbean      | 8.4                        | 6.1                              | 0.72      |
| Middle-Eastern Crescent†             | 9.6                        | 9.5                              | 0.99      |

\* Western Europe, North America, Australia, Japan, and New Zealand. † Plus newly independent states in Central Asia.

**Table 4. Global distribution of blindness by cause and by region**

| Region                               | Number of blind (x 10 <sup>3</sup> ) |                        |                        |                     |                        |
|--------------------------------------|--------------------------------------|------------------------|------------------------|---------------------|------------------------|
|                                      | Cataract                             | Trachoma               | Glaucoma               | Onchocerciasis      | Other                  |
| Established market economies*        | 84                                   | —                      | 180                    | —                   | 2,136                  |
| Former socialist economies of Europe | 91                                   | —                      | 74                     | —                   | 935                    |
| India                                | 5,120                                | 865                    | 1,141                  | —                   | 1,774                  |
| China                                | 2,166                                | 1,174                  | 1,514                  | —                   | 1,846                  |
| Other Asian countries and islands    | 2,314                                | 1,362                  | 973                    | —                   | 1,151                  |
| Sub-Saharan Africa                   | 3,101                                | 1,380                  | 853                    | 358.5               | 1,407.5                |
| Latin America and the Caribbean      | 1,326                                | 158                    | 183                    | 1.5                 | 631.1                  |
| Middle-Eastern Crescent†             | 1,627                                | 927                    | 205                    | —                   | 841                    |
| <b>Total (%)</b>                     | <b>15,820</b><br>(41.8)              | <b>5,866</b><br>(15.5) | <b>5,123</b><br>(13.5) | <b>360</b><br>(0.9) | <b>10,722</b><br>(283) |

\* Western Europe, North America, Australia, Japan, and New Zealand. † Plus newly independent states in Central Asia.

made available. This increase is, however, occurring almost exclusively in Africa and Asia, where 75% of the world's blindness occurs. The high population growth and increasingly elderly populations in these areas contribute to the upward trend.

While more information about low vision is required, available data indicate that there are 3 people with low vision for every blind person, a situation that has great socio-economic and public health significance. Further data on low vision and its causes will allow for proper national programme planning.

## Blindness in Asia

### China

In 1995, the population of China was estimated to be 1200 million people, of whom 100 million were aged more than 60 years.<sup>2</sup> An estimated 5 million people (0.4% of the population) are blind. A survey conducted in 1988 found that more than 40% of all

blindness is due to cataract, 25% was due to corneal scarring and/or trachoma, while 10% was due to glaucoma.

There are approximately 15,000 eye doctors in China, of whom 20% are surgically trained and regularly perform cataract surgery. There is therefore approximately one eye doctor per 80,000 population and one ophthalmologist per 400,000 people.

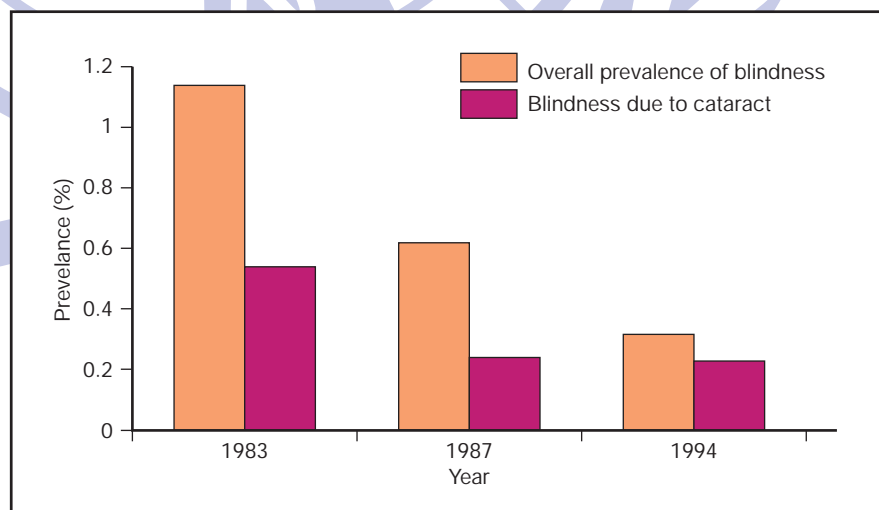
In 1994, approximately 150,000 cataract operations were performed in China, giving an overall cataract surgical rate (CSR) of 130 cataract operations per million population per year. However, the range varies between different provinces from 65 to 450 cataract operations per million people per year. The rate is higher in the larger cities and lower in rural areas.

Population based studies in 2 counties in China, performed in 1995, show the prevalence of bilateral blindness in Doumen and Shunyi to be 2.6% and 1.9%, respectively, with a cataract surgical coverage of 30% and 40%, respectively.<sup>3</sup> These figures indicate that the prevalence of blindness in China has probably slightly decreased during the previous 10 years. However, the cataract surgical coverage is still unsatisfactory.

### Thailand

Blindness surveys in Thailand performed between 1983 and 1994 show an overall reduction in the prevalence of blindness of more than 70% (figure 1). The programme for the prevention of blindness in Thailand has been successful, and the country now has 92 eye units in the 72 provinces. There are more than 300 ophthalmologists, with 124 working in the government sector. More than 60,000 cataract operations are

**Figure 1. Prevalence of blindness/ataract blindness in Thailand between 1983 and 1994.**



**Table 5.** Age-specific prevalence of blindness (< 6/60)

| Place                    | Age group (years) |         |       |
|--------------------------|-------------------|---------|-------|
|                          | 50 - 59           | 60 - 69 | > 70  |
| Doumen, China (n = 5759) | 0.6%              | 1.2%    | 5.3%  |
| Shunyi, China (n = 5555) | 0.2%              | 1.7%    | 5.3%  |
| Nepal (n = 5112)         | 1.3%              | 3.7%    | 10.6% |

performed each year, and may be in excess of 100,000 if all private operations are included. Training in primary eye care has reached 50 of the 72 provinces.

**India**

The last national survey in India gave a blindness prevalence of 0.7%. A survey performed in Gujarat State in 1992 showed an overall decline in the prevalence of blindness and of cataract. However, a recent survey has shown an overall increase in the prevalence of blindness and cataract since 1986. The national CSR is approximately 2700 operations per million people per year. The CSR in Karnataka is similar to the national rate, while Gujarat has a high CSR of approximately 5000 operations. Studies from Karnataka suggest that fear of surgery and cost are important barriers to the delivery of cataract surgery.

**Nepal**

The prevalence of blindness in people older than 45 years is 3% in Nepal. Cataract is responsible for 78% of all blindness. The age-specific prevalence of blindness in Nepal is approximately twice that of China

(table 5), although the cataract surgical coverage is similar if not higher.

**Viet Nam**

The population of Viet Nam is approximately 70 million, divided into 45 provinces. There are sufficient ophthalmologists (more than 400) although many surgeons have limited supplies and equipment. The goal of the cataract programme in Viet Nam was to increase surgical output. Approximately 50,000 surgeries are now performed each year (CSR 750) from an initial figure of 10,000 surgeries per year.

**The Philippines**

The prevalence of blindness is estimated at approximately 1% , with 60% being due to cataract. A training programme for ophthalmologists to work in rural and provincial areas has been running for some years with good results.

**In Conclusion**

Certain blinding diseases (most notably onchocerciasis and vitamin A deficiency) appear to be decreasing due to adequate

control measures. However, the increasing ageing population is resulting in an increase in the prevalence of blindness due to cataract and glaucoma. There are often marked variations between different geographical areas, socio-economic groups, and age and gender in terms of prevalence of blindness and coverage by eye care services.

Rural communities tend to have a higher prevalence of blindness than urban societies, although eye care facilities tend to be better developed in cities than in rural areas. Overall, there has been a marked improvement in the number of eye surgeons and assistants trained to provide eye care. However, there is still a need to improve the availability of eye care staff in rural areas.

1. Thylefors B, Négrel A-D, Pararajasegaram R, Dadzie KY. Global data on blindness. Bull WHO 1995;73:115-121.
2. WHO/Ministry of Health/International NGDO Coordination meeting for the prevention of blindness in China. Jiangyin, China, 13-16 November 1995. WHO/PBL/96.52.
3. Informal consultation on analysis of blindness prevention outcomes. WHO, Geneva, Switzerland, 16-18 February 1998. WHO/PBL/98.68.

This report has been written by a staff medical reporter using information provided by the World Health Organization.

