Informal Consultation

on Analysis

of Blindness Prevention Outcomes

Geneva, 16-18 February 1998
## CONTENTS

**INTRODUCTION** ................................................................. 1

1. **REVIEW OF AVAILABLE RESULTS FROM NATIONAL BLINDNESS PREVENTION PROGRAMMES** ................. 1

   1.1 China ............................................................................. 1
   1.2 Nepal ............................................................................. 1
   1.3 Philippines ................................................................. 3
   1.4 Viet Nam ...................................................................... 3
   1.5 Thailand ..................................................................... 3
   1.6 India .......................................................................... 5
   1.7 The Gambia ............................................................... 5
   1.8 West Africa ................................................................. 8
   1.9 Morocco ...................................................................... 8
   1.10 Tunisia ...................................................................... 9

2. **COMMON ISSUES AND TRENDS** ....................................... 9

   2.1 Coverage of national programmes and reduction achieved of blindness ....................................... 9
   2.2 Access to eye care services ............................................. 10
   2.3 Affordable eye care ...................................................... 10
   2.4 Eye care technology ..................................................... 10

3. **OUTCOME OF CATARACT SURGERY** ............................ 11

   3.1 Safety and efficacy and quality of services ...................................................................................... 11
   3.2 Quality of life and patient satisfaction ............................................................................................ 11
   3.3 Uptake of surgery ........................................................ 11

4. **FUTURE STRATEGIC ISSUES** .......................................... 12

   4.1 Cataract - a public health issue requiring political and professional commitment ...................... 12
   4.2 Making eye care accessible; how to reach those most in need? ..................................................... 12
   4.3 Affordability - cost versus price ...................................................................................................... 13
   4.4 Cataract surgery - offering a desirable product ............................................................................ 13

5. **RESEARCH ISSUES AND FUTURE DEVELOPMENTS** ....... 14

   5.1 Surgical technique ......................................................... 14
   5.2 Cost-recovery and financial sustainability ...................................................................................... 14
   5.3 Barriers to delivering eye care ........................................ 14
   5.4 Planning and management .............................................. 15

**CONCLUSIONS AND RECOMMENDATIONS** ......................... 16

**ANNEX I.** **AGENDA** .......................................................... 20

**ANNEX II.** **LIST OF PARTICIPANTS** ................................. 21

**ANNEX III.** **GUIDELINES TO MONITOR THE OUTCOME OF CATARACT SURGERY** .................... 23
INTRODUCTION

The meeting was opened by Dr B. Thylefors, Director of the Programme for the Prevention of Blindness and Deafness. He informed the participants that 1998 marked the twentieth year of the Programme (Prevention of Blindness), and it was therefore particularly appropriate to look back at the achievements and constraints that have been experienced, with a view to recommending how the programme should proceed in the future, particularly in respect to monitoring and evaluating the outcome of prevention of blindness programmes in Member States.

Dr Carl Kuper was elected Chairperson, Professor Gordon Johnson, Vice-Chairperson, and Mr R. Thulasiraj and Dr Allen Foster, Rapporteurs.

The draft agenda was adopted with no modification (see Annex I); the list of participants is given in Annex II.

1. REVIEW OF AVAILABLE RESULTS FROM NATIONAL BLINDNESS PREVENTION PROGRAMMES

A selection of national programmes for the prevention of blindness was reviewed, in relation to the availability of data on output and progress made. An attempt was also made to distinguish a trend for each WHO region, with an analysis of the present situation with regard to blinding diseases.

1.1 China

Population-based studies were undertaken in two counties, Shunyi and Doumen, in 1995. Approximately 5000 individuals aged 50 years or over were examined in each county. The prevalence of bilateral blindness (less than 3/60) was 2.6% in Doumen and 1.9% in Shunyi. The cataract surgical coverage was between 30% and 40% in both counties.

In 152 postoperative cataract eyes in Doumen and 116 eyes in Shunyi, the functional poor visual outcome, defined as less than 6/60, in the operated eye was 53% in Doumen and 45% in Shunyi. This improved to 40% in both counties when visual acuity with pin-hole was measured.

During the discussion it was pointed out that:

- the prevalence of blindness in China is probably a little less than 10 years ago;
- the cataract surgical coverage is still unsatisfactory;
- the high proportion of poor visual outcome following cataract surgery is of concern.

1.2 Nepal

In a population-based study of approximately 5000 people in Nepal, the prevalence of blindness in people over the age of 45 years was 3.0%. Cataract was responsible for 78% of all blindness. The cataract surgical coverage for patients with less than 6/60 in both eyes was estimated to be 42%. The functional visual acuity in 220 postoperative cataract eyes was less than 6/60 in 30% of eyes. This improved to 11% with best correction.

In the discussion it was stressed that:

- the age-specific prevalence of blindness in Nepal is approximately twice that found in China;
- the cataract surgical coverage in Nepal is similar to that in China, and possibly a little higher;
the high proportion of poor visual outcome following cataract surgery, as in several other countries, is a matter of great concern.

Table 1. Age-specific prevalence of blindness (<6/60)

<table>
<thead>
<tr>
<th>Place</th>
<th>Age groups (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50-59</td>
</tr>
<tr>
<td>Doumen, China, 1995</td>
<td>0.6%</td>
</tr>
<tr>
<td>$n = 5759$</td>
<td></td>
</tr>
<tr>
<td>Shunyi, China, 1995</td>
<td>0.2%</td>
</tr>
<tr>
<td>$n = 5555$</td>
<td></td>
</tr>
<tr>
<td>Nepal</td>
<td>1.3%</td>
</tr>
<tr>
<td>$n = 5112$</td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Functional visual outcome (%) in patients (better eye)

<table>
<thead>
<tr>
<th></th>
<th>Doumen ($n = 109$)</th>
<th>Shunyi ($n = 86$)</th>
<th>Nepal ($n = 159$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/6-6/18</td>
<td>51</td>
<td>51</td>
<td>59</td>
</tr>
<tr>
<td>&lt;6/18-6/60</td>
<td>17</td>
<td>24</td>
<td>18</td>
</tr>
<tr>
<td>&lt;6/60-3/60</td>
<td>15</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>&lt;3/60</td>
<td>17</td>
<td>21</td>
<td>15</td>
</tr>
<tr>
<td>Missing</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 3. Visual outcome in operated eyes, China and Nepal, 1995 (%)

<table>
<thead>
<tr>
<th>Functional acuity</th>
<th>Functional acuity</th>
<th>Best acuity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Doumen $n = 152$</td>
<td>Shunyi $n = 116$</td>
</tr>
<tr>
<td>6/6-6/18</td>
<td>12</td>
<td>25</td>
</tr>
<tr>
<td>&lt;6/18-6/60</td>
<td>36</td>
<td>30</td>
</tr>
<tr>
<td>&lt;6/60-3/60</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>&lt;3/60</td>
<td>41</td>
<td>39</td>
</tr>
<tr>
<td>Missing</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
1.3 Philippines

In December 1996, there was a national workshop on prevention of blindness in the Philippines. A training programme for ophthalmologists to work in the rural/provincial areas has been running for a number of years with good results. It is estimated that the prevalence of blindness is approximately 1%, with 60% being due to cataract.

1.4 Viet Nam

The population of Viet Nam is approximately 70 million, divided into 45 provinces. There are sufficient ophthalmologists (more than 400); however, many eye surgeons have limited supplies and equipment. The goal of the cataract programme has been to increase surgical output, with the result that, from an initial figure of 10,000 surgeries per year, approximately 50,000 surgeries are now performed each year (CSR of 750).\(^1\) There is a move from intracapsular cataract extraction (ICCE) to extracapsular cataract extraction (ECCE), with posterior chamber intraocular lenses (PC-IOLs). The outcome of surgery needs to be evaluated.

1.5 Thailand

The programme for the prevention of blindness in Thailand has been successful, with an overall reduction in the prevalence of blindness of more than 70% between 1983 and 1994.

The first survey of blindness in Thailand in 1983 gave a prevalence of blindness of 1.14%, with 47% being due to cataract. The second survey in 1987 gave a prevalence of 0.62%, with 38% being due to cataract. The most recent survey in 1994 gave a prevalence of 0.31%, with 75% being due to cataract.

*The basic statistics of the current eye care programme:*

- 92 eye units in the 72 provinces.
- Over 300 ophthalmologists, with 124 in the government sector.
- 50 of 72 provinces have had training in primary eye care.
- More than 60,000 cataract operations are performed each year and probably including private practitioners in excess of 100,000.

---

\(^1\) CSR = Cataract Surgical Rate. This figure refers to the number of cataract surgeries performed (as reported or estimated) per million population per year.
Prevalence of Blindness/Cataract Blindness in Thailand

- Overall prevalence of blindness
- Blindness due to cataract
1.6 India

The last national survey in 1986 gave a prevalence of blindness (<3/60) of 0.7% and 1.49% for less than 6/60. In Gujarat State in 1992, a survey showed an overall decline in the prevalence of blindness and cataract blindness. However, in Karnataka, a recent survey has shown an increase in the prevalence of blindness and cataract since 1986.

Gujarat has a high surgical output with a cataract surgical rate of approximately 5000 operations/million population/year, whereas the national CSR is about 2700. The cataract surgical output in Karnataka is similar to the national figure. Considering these crude data, it is felt that, overall, the blindness prevalence in India is probably increasing given the demographic population changes.

1.7 The Gambia

The population of The Gambia is now 1.1 million. In 1986, a national population-based survey of 8000 people gave a prevalence of blindness of 0.7%, with cataract (47%), trachoma (17%) and corneal opacity (11%) being the three major causes. There were an estimated 5400 people blind and 10 900 (prevalence 1.41%) with low vision (<6/18-3/60).

In a repeat survey in 1996 of 13 000 people, the prevalence of blindness was 0.42%, with the major causes being cataract (46%), corneal opacity (17%) and uncorrected aphakia (13%). The prevalence of low vision was 1.61%. There were an estimated 4900 people blind and 18 800 with low vision.

There has been a 9% reduction in the actual number of blind people and a 71% increase in the actual number of people with low vision.

Comparing age-sex adjusted rates, there has been a 30% reduction in the prevalence of blindness over the 10-year period, but an increase in the prevalence of low vision of 37%. Key elements in the success of the programme have been:

- basing eye care in the community through health education and training of primary health care workers;
- training of paramedical personnel in eye care to serve a population of 100 000 people;
- training of eye paramedical staff as cataract surgeons, 1 per 250 000 population;
- national planning and coordination;
- support of the Ministry of Health and interested nongovernmental organizations;
- a population size which is conducive to management (i.e. approximately 1 000 000).

The CSR has increased from 250 in 1986 to 859 in 1996, with each cataract surgeon doing nearly 300 cataract operations per year.

The percentage of cataract operations being done with IOL implantation is 85% in the tertiary centre and 60% in the secondary units. If defaulters to follow-up are excluded, 95% of eyes achieved 6/18 best corrected visual outcome at a secondary level centre.

In the discussion which followed, it was emphasized that, although the programme has been able to reduce the prevalence of blindness by 30%, because of an increasing ageing population the actual number of blind people has fallen by less than 10%.
Of concern is the almost doubling in the number of people with low vision, as a significant proportion of these people need cataract surgery, and failure to meet this need may result in an increase in blindness in the future due to population growth and longevity.

Prevalence of Blindness, The Gambia
1986 and 1996

Number of Blind and Low Vision in The Gambia
1986 and 1996

<table>
<thead>
<tr>
<th></th>
<th>1986</th>
<th>1997</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manpower</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ophthalmologists</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Cataract surgeons</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Ophthalmic nurses/Medical assistants</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Bridging cadre</td>
<td>-</td>
<td>36</td>
</tr>
<tr>
<td>Community-based workers</td>
<td>-</td>
<td>&gt;1000</td>
</tr>
<tr>
<td><strong>Centres</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tertiary</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Secondary</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Bridging cadre/Outreach points</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td><strong>Outcome</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Survey results:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prevalence of blindness</td>
<td>0.7%</td>
<td>0.4%</td>
</tr>
<tr>
<td>(Age standardized to 1993 Census)</td>
<td>0.6%</td>
<td>0.4%</td>
</tr>
<tr>
<td><strong>Causes of blindness</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cataract</td>
<td>47%</td>
<td>46%</td>
</tr>
<tr>
<td>Uncorrected aphakia</td>
<td>8%</td>
<td>13%</td>
</tr>
<tr>
<td>Trachomatous corneal opacity</td>
<td>17%</td>
<td>5%</td>
</tr>
<tr>
<td>Non-trachomatous corneal opacity</td>
<td>11%</td>
<td>17%</td>
</tr>
<tr>
<td>Phthisical or disorganized globe</td>
<td>9%</td>
<td>4%</td>
</tr>
<tr>
<td>Glaucoma</td>
<td>2%</td>
<td>9%</td>
</tr>
<tr>
<td>Optic atrophy</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Others</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td>Burden of blindness (persons)</td>
<td>5 400</td>
<td>4 900</td>
</tr>
<tr>
<td>Burden of low vision</td>
<td>10 900</td>
<td>18 800</td>
</tr>
<tr>
<td><strong>Population</strong></td>
<td>775 000</td>
<td>1 169 000</td>
</tr>
</tbody>
</table>
1.8 West Africa

- L’Organisation pour la Coopération et la Coordination de Lutte contre les Grandes Endémies (OCCGE) includes the following countries: Benin, Burkina Faso, Côte d’Ivoire, Mali, Mauritania, Niger, Senegal, Togo; together they have a population of 61 million people.

- The prevalence of blindness varies from 0.7% to 2.2%, with an estimated total of 900,000 persons being blind and 2.7 million having low vision.

- The major causes of blindness are cataract, trachoma, glaucoma, onchocerciasis and vitamin A deficiency.

- Support to blindness prevention and the provision of eye care is given by the European Union, the Ministry of French Cooperation and a group of nongovernmental development organizations.

- There is one ophthalmologist for 500,000 population, but the distribution is very unequal between the countries and between urban and rural areas.

- There is one specialized eye nurse per 400,000 population; the training of both ophthalmologists (4 years) and eye nurses (1-2 years) is conducted on an intercountry basis at the Institute of African Tropical Ophthalmology (IOTA) in Bamako, Mali. This is the reference eye care institution for the OCCGE countries.

- There are 79 surgical eye centres (one per 772,000 population); this should increase to 100 by 1999, with the support mentioned above.

- Approximately 22,000 cataract surgeries are performed in the OCCGE countries each year, which gives a CSR in the order of 360 operations/million/year (5-10% are with IOLs).

- The cost of cataract surgery in the public sector is about US$ 55, and in the private sector US$ 250-900.

- Approximately 66% of surgery is provided by the government, 20% by nongovernmental development organizations and 14% by the private sector.

- Cataract is still the major cause of blindness, as the available manpower for surgery is insufficient; thus, it is estimated that the cataract blindness backlog is in excess of 360,000 people.

1.9 Morocco

In Morocco, in 1992, a population-based study of 8878 people gave a prevalence of blindness of 0.8% and of low vision of 2.3%. Cataract was responsible for 45% of blindness and 43% of low vision. The cataract surgical coverage was 25%. Of patients with aphakia, only 40% had available correction with spectacles.

A more detailed study of 400 people having surgery showed that 84% of operations were on the first eye, and 35% of the procedures were performed on bilaterally blind people. Half the operations were performed with a PC-IOL. At three months post-operatively, 3.7% of eyes had a poor outcome (less than 6/60) with best correction. Six patients were still bilaterally blind (1.5%).
1.10 Tunisia

A population-based survey of 3547 people in Tunisia, in 1993, gave a prevalence of blindness of 0.8% and of low vision of 2.0%. Cataract was responsible for 66% of blindness and 55% of low vision. The cataract surgical coverage was 29%, with one in six having a PC-IOL. Of those without an IOL, 41% had correction for aphakia.

2. COMMON ISSUES AND TRENDS

2.1 Coverage of national programmes and reduction achieved of blindness

A. African Region

There are few countries which have demonstrated a reduction in blindness prevalence, and overall it is felt that blindness in this Region is on the increase in terms of numbers and prevalence.

B. Region of the Americas

There are relatively little data available from the Region on the prevalence of blindness. There are changes in terms of health care delivery, with some governments taking more responsibility for the provision of health care.

C. Eastern Mediterranean Region

In some countries there is evidence that blindness is decreasing and eye care is improving, but other countries in the Region with large populations still have inadequate provision of eye care services.

D. European Region

There are limited data available from some countries over the last decade, indicating no particular change in Western Europe, with prevalences of blindness from 0.2-0.5%. For Central and Eastern Europe even less data are available, except for Bulgaria (0.5% blindness), and there is no information whatsoever from the Central Asian Republics.

E. South-East Asia Region

It is considered that the prevalence of blindness is continuing to increase within the Region, despite the remarkable efforts made by the programme in India to increase the number of cataract operations being performed. The CSR in India is now 2700 operations/million population/year.

F. Western Pacific Region

Some countries of the Region have shown a fall in the prevalence of blindness in the last two decades. The evidence from China is one of a static situation, although the data are limited.

During the discussion, the following points were made:

- Certain blinding diseases appear to be decreasing due to control measures, most notably onchocerciasis and vitamin A deficiency; the situation with trachoma is less clear; and the ageing population is resulting in an increase in the prevalence of blindness due to cataract and glaucoma.

- Because of demographic changes, one needs to distinguish between changes in prevalence and changes in the actual number of people with disease; for example, a static or even falling
prevalence of blindness may be associated with an actual increase in the number of people who are blind, due to population growth and an ageing population.

> Within a country, there are often marked variations between different geographical areas, socioeconomic groups and age/gender groupings in terms of prevalence of blindness and coverage by eye care services; for example, within one state of India it has been shown there is a fivefold difference in prevalence between the lowest and highest figures in different districts. Furthermore, the prevalence of cataract blindness is usually greater in women than in men, apparently due to differences in access to surgical services.

2.2 Access to eye care services

When reviewing the available information and specific data from the countries selected, the following conclusions were formulated:

> Rural communities tend to have a higher prevalence of blindness than urban societies.
> Eye care facilities tend to be better developed in cities and towns than in rural areas.
> Models have been developed to make eye care more accessible to rural populations; these include eye camps, satellite surgical centres and mobile clinics.
> Overall, in the last two decades there has been marked improvement in the number of eye surgeons and eye assistants who have been trained to provide eye care.
> There is still a great need to improve the availability of eye care staff in rural, as opposed to urban, areas.

2.3 Affordable eye care

As the cost of eye care and cataract surgery is often an important barrier to improved uptake of eye care services, the following points were made in the discussion of this matter:

> There are good models in Asia which have demonstrated innovative methods of cost-recovery in order to subsidize eye care for the very poor.
> In Africa, ministries of health feel responsible for health and eye care, but the economic climate during the last decade has implied very limited resources available for eye care services.
> In Latin America, the ongoing health care reform should result in eye care becoming more affordable to the poor in society.
> The voluntary and private sectors can play a valuable role in providing affordable eye care to poor communities.
> It was pointed out that, with increasing cost of health care, there is a danger that if governments abdicate the responsibility for providing health and eye care for the poorest in society then the inequality between services for the ‘haves’ and ‘have nots’ in society will further increase.

2.4 Eye care technology

> One of the positive changes during the last two decades has been the development of good-quality, low-cost technology which has made medicines, spectacles, IOLs and, more recently, sutures affordable. This has resulted in an ability to reduce the cost of cataract surgery, while improving the outcome in terms of sight restoration.
At the same time there has been a move to more and more expensive equipment being used in cataract surgery, as surgeons seek to keep up with the latest developments. While this is a logical professional trend, there will be a need to continue efforts to reduce the cost of cataract surgery in large-scale interventions, for services to the poorer population groups.

3. OUTCOME OF CATARACT SURGERY

3.1 Safety, efficacy and quality of services

A randomized clinical trial at Aravind Eye Hospital, in India, compared 1700 eyes undergoing ICCE with spectacles against 1700 eyes having ECCE with PC-IOL. The visual outcome at one year showed that with best correction 96% of ICCE eyes and 98% of ECCE procedures achieved a visual acuity of 6/18 or better. This study demonstrates what can be achieved in a centre of excellence with patients who have uncomplicated cataract. In conclusion, the ECCE + IOL procedure was more effective in restoring vision, and it was also safer than ICCE; the latter technique is, however, still justifiable under conditions when IOL surgery cannot be practised.

Population-based studies in Karnataka State, in India, have shown a prevalence of bilateral cataract (less than 6/60) of 8.8%. The cataract surgical coverage for this category of cataract was 53%. A similar but smaller study in Gujarat State, where the socioeconomic and eye care situation is well developed, showed a prevalence of bilateral cataract of 2.9% with an 85% coverage. The prevalence of cataract in both situations was higher for women than for men, and the coverage rates were lower for women.

Data from these two States on outcome reported that 24-26% of postoperative eyes had a poor outcome with a visual acuity of less than 6/60. Poor outcome was a larger problem in aphakic patients than in those who had received an intraocular lens.

Hospital-based studies looking at the short-term outcome of cataract surgery in Karnataka and Gujarat States have shown that 17% of eyes have a poor outcome (<6/60). Operations performed under eye camp situations tended to have a higher rate of poor outcome than those cases performed in hospital situations.

An outline of a suggested monitoring scheme, indicating performance level, is given in Annex III.

3.2 Quality of life and patient satisfaction

Studies in India and other countries have demonstrated that cataract surgery, overall, dramatically improves the quality of life and that the improvement in quality of life is more marked in patients receiving an IOL than in those who are given aphakic spectacles.

3.3 Uptake of surgery

Studies in India, interviewing both operated and non-operated cataract patients and the community as a whole, have identified certain barriers to delivery of cataract surgery. Some of those are due to the provider, while other barriers are specific to the consumer.

Communities in south India report that some individuals are fearful of eye surgery and have a perception that cataract surgery is expensive, due either to the direct cost of operation, or to the indirect costs of transport, escort, etc. Fear and cost are therefore important barriers.

In studies in Karnataka State, cataract patients gave the most important reason as being that the cataract was not yet “mature”, which may reflect that the patient has been refused “early” surgery by
ophthalmologists in eye camp situations where the indication for cataract surgery is often less than 1/60 acuity in both eyes.

4. FUTURE STRATEGIC ISSUES

4.1 Cataract - a public health issue requiring political and professional commitment

It was recognized that the increasing burden of blindness and visual loss from cataract is a public health problem in many countries, with a significant negative impact on the quality of life of the individual and the family.

It is also true that the loss of working capacity caused by visual loss due to cataract is a significant economic burden on the family, the community and the nation as a whole.

The burden of blindness and visual loss is most marked in poor communities, with rural villages and women being particularly affected.

The cost of cataract surgery, through efficient utilization of resources, high productivity and low-cost technologies, can be reduced to US$ 23-100 depending on the situation. However, this cost is still a significant barrier to the most vulnerable in society. It is therefore necessary to maintain a system of subsidy, either from governments or from other sources to ensure that the “price” is not a barrier to delivery of cataract surgery.

For an overall improvement in eye health and greater access to eye care, there is a need for:

- community participation in planning and development;
- “ownership” including decision-making and planning of the service by the professionals together with the community;
- commitment to funding a service for the poor in society by governments, or other sources.

A national group comprising ophthalmologists, other eye care professionals, nongovernmental organizations and leaders of the community should take the initiative of influencing government policies on eye care and generate a greater commitment amongst the professionals towards improving the uptake and quality of eye care services.

4.2 Making eye care accessible; how to reach those most in need?

In some countries, improvised delivery of cataract surgery (eye camps) has been a popular strategy to make surgery more accessible and affordable to rural communities. However, the quality of results under these situations has been criticized. Although not ideal, the eye camp strategy has facilitated easier access, particularly in very remote areas.

Overall, it was felt that there should be a move to hospital-based cataract surgery, as already initiated in most countries. However, in the interim there may be a role for well-conducted eye surgical camps in certain situations.

The eye camp strategy has been used less frequently in Africa, where there is a lower density of population. In this situation, a strategy of “screening eye clinic”, followed by provision of transport for cataract patients to a base hospital for surgery, has been used with success. This strategy may be useful in a variety of different settings, when there are dispersed populations far away from regular eye care services.
4.3 Affordability - cost versus price

The distinction was made between “the cost” of surgery - i.e. the actual cost to the provider for delivering a product - and “the price”, which is the amount the consumer is asked to pay for the product.

The cost of cataract surgery can be contained through efficient utilization of resources and the use of low-cost technologies for “consumables”. Good models of cost-containment have been developed particularly by non-profit organizations in India and Nepal. A study in Nepal in two efficient centres showed the total cost of cataract surgery to be approximately US$ 30, with an average of 25% being on salaries, 40% on supplies, 15% on depreciation and 20% on other miscellaneous costs.

In one of the units in Nepal, cataract surgery had been priced so that 90% of the total expenditure was being recovered from patient fees, while in the other unit cost-recovery was not well developed and external donations were required to subsidize cataract surgery.

The overall aim must be a combination of cost-containment, with high productivity to keep the actual cost per cataract operation as low as possible, and a “pricing” structure which allows for good cost-recovery and financial independence, yet still provides a subsidized price for cataract surgery which the poorest in society can afford. In model programmes which have developed this strategy, it has been found that the lowest “price” for cataract surgery should be maintained at a level equivalent to less than one month’s minimal salary for the country, while retaining an option of free services for the poorest population groups.

4.4 Cataract surgery - offering a desirable product

Taking into account identified barriers to the uptake of cataract surgical services, more emphasis needs to be placed on awareness and promotion in communities where uptake is still low and where there are no obvious cost/price barriers. The “happy operated” patient can be an effective promoter in many instances; this presupposes that the person has experienced good services, with no particular pain or discomfort, and that the gain in terms of visual outcome has been worthwhile.

One apparently global need is to improve the quality of services offered in relation to cataract surgery:

- More flexible hospitalization schemes, ranging from outpatient/day-care surgery to a stay in hospital for a few days, depending on the social situation for the patient.

- Ability to meet the increasing demand for IOL surgery, in terms of service provision.

- Maintaining high surgical standards and an appropriate monitoring of outcome, in terms of both safety (complications) and efficacy (effective sight restoration) (see Annex III).

- Offering cataract surgery at what is locally perceived as an affordable cost, for all population groups.
5. RESEARCH ISSUES AND FUTURE DEVELOPMENTS

5.1 Surgical technique

There is presently a variety of different surgical techniques being performed for cataract removal. These include:

- intracapsular extraction (ICCE) with spectacles (AG)
- extracapsular extraction (ECCE) with spectacles (AG)
- intracapsular extraction (ICCE) with anterior chamber intraocular lens (AC-IOL)
- extracapsular extraction (ECCE) with posterior chamber intraocular lens (PC-IOL)
- extracapsular extraction (ECCE) by phacoemulsification (PHACO)

While each technique has its own advantages and disadvantages in terms of results and cost, there is clearly a global trend towards ECCE and, when feasible, IOL implantation. The increasing use of phacoemulsification, while useful in certain settings, may not be easily applicable to the large-scale cataract services required in developing countries, as it adds to cost and complexity, while not being useful in mature and hypermature cataracts.

It is recognized that adequate training and appropriate facilities and equipment are essential for each of these techniques to be successful. The choice of technique should be governed by the rule of appropriate technology, e.g. what gives the best results on a locally sustainable basis.

Further operational research is required to decide on the optimal product of high-quality/low-cost cataract surgery in each setting.

5.2 Cost-recovery and financial sustainability

Failure to contain costs and recover costs for cataract surgery results in either programmes which are poorly equipped and supplied, or programmes which price cataract surgery at a level which is not affordable to poor patients.

However, there are models which have been developed in the non-government sector which deliver high-volume, good-quality surgery at a "price" which is affordable to everyone in society. Such pricing should include "0" as a price to ensure that none is excluded.

Further operational research is required to determine how the lessons and models from South-East Asia can be applied in other parts of the world, and particularly in the government sector. Such research should focus on both the paying capacity and the patients' service expectations.

5.3 Barriers to delivering eye care

There are several "providers" originating barriers which need to be identified and addressed, i.e. good-quality care, affordable price, accessibility to all sectors of society.

There are also deep-rooted "consumer" barriers, which have their origins in traditional beliefs and practices. In order to address the "consumer" barriers, it is felt that there is a need to research existing traditional methods/people for dealing with eye disease and to investigate ways in which these traditional, community-acceptable approaches can be integrated into the provision of eye care services.
5.4 Planning and management

Successful model programmes have all been characterized by good planning and efficient management of resources - personnel and money. It is increasingly recognized that such successful programme development requires a team approach with goal-oriented leadership and with well-defined targets to measure progress.

Operational research is still required to identify training needs and investigate methods for retraining and motivating hospital staff in how to effectively plan and efficiently manage eye care programmes, both within and outside hospital structures.
CONCLUSIONS AND RECOMMENDATIONS

OVERVIEW - TRENDS IN BLINDNESS PREVENTION

Participants recognized that during the two decades of the programme there have been some remarkable achievements, but acknowledged that blindness is still an increasing problem in many Member States due to a number of existing and new constraints.

Achievements

During the last two decades there have been some notable positive developments in blindness prevention programmes. These include the following:

(a) National programmes

(i) The establishment of more than 100 national committees/programmes for prevention of blindness.

(ii) The establishment of model programmes providing high-quantity and good-quality eye care, using cost-recovery initiatives which allow for subsidized eye care/surgery for poor patients.

(iii) Evidence for a reduction in the prevalence of blindness in some WHO regions, most notably the Western Pacific Region, some countries of the Eastern Mediterranean Region and the Region for the Americas. This has been demonstrated by repeat cross-sectional surveys of blindness in several countries.

(b) Disease control

(i) There is convincing evidence for a reduction in the prevalence and number of people going blind from onchocerciasis, vitamin A deficiency and probably trachoma.

(c) Resource mobilization

(i) An improved ratio of eye specialists and eye nurses per population, resulting from an increase in the number of training programmes and graduates, as well as an overall increase in infrastructure for eye care.

(ii) The development of low-cost technologies for eye drops and spectacles, and low-price sources for intraocular lenses and, most recently, eye sutures.

(iii) Increased mobilization of funds from the international nongovernmental organizations, the Lions SightFirst programme and the World Bank programme for cataract in India and onchocerciasis in Africa, as well as mobilization of resources from the community and local sources.
Constraints

Despite these positive developments, the participants presented evidence to demonstrate that overall the number of blind people in the world continues to increase. This seems to be particularly important in countries of the African and South-East Asia Regions. Factors contributing to this increase are:

(a) an increasing world population; in particular an increase in the over-50-year-old population, resulting in more blindness from cataract and glaucoma;

(b) a decline in the economic status of some of the most vulnerable Member States affecting health care delivery, particularly those in the African Region;

(c) the increasing cost of eye care in situations where new technology and instrumentation may or may not be indicated for eye surgery;

(d) inadequate monitoring of programme developments and management;

(e) inadequate access to eye care causing a high prevalence of blindness in marginalized sectors of society, particularly the female, rural, poor and elderly population;

(f) the unequal distribution of eye care personnel and services;

(g) the inadequate involvement and participation of the community in developing eye care.

1. PROGRAMME DEVELOPMENT

1.1 Assessment of blindness and cataract

There is a need for more assessment of the outcome and impact of blindness prevention interventions, as part of the evaluation of national programmes. It is therefore recommended that such assessments be undertaken on a regular basis, focusing particularly on the prevalence of blindness in defined population groups and on cataract surgical coverage and outcome.

1.2 Advocacy for programme development

It is recommended that in individual countries an advocacy group including the ophthalmic society, the nongovernmental community and the national committee continue to encourage the ministry of health (a) to support programmes on prevention of blindness, and (b) to facilitate efforts to improve efficiency, quality and equity.

2. CATARACT OUTPUT

2.1 Population-based rapid assessments of cataract coverage

There is evidence from a number of studies in Asia and Africa that the cataract surgical coverage ranges between 10% and 50%, although one study in India has demonstrated that it is possible to achieve a rate in excess of 80%. A simple, standardized, inexpensive methodology has been developed to assess coverage.

The group recommended this methodology for general use by programme managers to obtain useful information on cataract prevalence, coverage, barriers and outcome which can be used for programme planning.
2.2 Barriers to cataract output

There is a need to increase the output of cataract surgery as demonstrated by the cataract surgical rate (CSR) being less than 2000 operations/million population/year in most situations. (Rates in industrialized countries are usually in excess of 3500.)

Barriers to be addressed in order to provide more cataract surgery include optimum utilization of available resources by providers, improved quality of outcome, and making surgery affordable through a variety of cost-containment and cost-recovery mechanisms.

There is also a need for greater involvement of the community in developing, promoting and evaluating eye care services.

2.3 Community participation in case-finding and uptake

To overcome the low coverage of cataract surgery experienced in some countries, it is necessary to further develop community participation in eye care programmes.

It is recommended to particularly strengthen cataract case-finding and uptake at the community level through the mobilization and training of appropriate local personnel.

2.4 Eye camps

With more widespread eye care infrastructure, there is less of a need to perform surgical eye camps in improvised settings. Available data show that hospital-based surgeries give better visual outcomes. In order to improve the quality of cataract surgery and to influence health-seeking behaviour, it is recommended that screening eye clinics be done in the community and cataract surgeries be performed in hospital settings. However, it is recognized that in some situations this may not be feasible and, in such instances, eye surgical camps may be performed, providing that sufficient care and supervision are provided to ensure the quality.

2.5 Early cataract surgery

It is recognized that early cataract surgery can prevent significant disability from visual loss. It is recommended that programmes encourage eye surgeons to provide cataract surgery to patients before visual loss and blindness have had a significant economic and social impact.

3. CATARACT OUTCOME

3.1 Monitoring cataract outcome

There are relatively little data available on the outcome of cataract surgery, but recent studies suggest that the presenting vision in 20% or more of cases in the developing world have a poor outcome (acuity less than 6/60). Patients with poor outcome may produce a negative attitude towards eye care in the community. The causes of poor outcome include pre-existing eye disease, surgical complications and postoperative refractive errors. It is therefore recommended that:

(a) guidelines for preferred practices (pre-, per- and postoperative) for cataract surgery be developed for use in national programmes;

(b) recommended guidelines (and a protocol) be used, on a regular basis, by eye surgeons to monitor the outcome of their own cataract surgery, in order to improve the visual outcome results (see Annex III).
3.2 Improving cataract outcome

(a) Use of IOLs

An important cause of poor visual outcome after cataract surgery is lost or broken aphakic spectacles.

It is therefore recommended that there be a move towards the routine use of IOLs in situations where appropriate skills and facilities can ensure safety and affordability. Efforts should be made to provide good-quality cataract surgical training.

(b) Use of best spherical equivalent spectacles

Where IOLs are not being used, it is recommended, on the basis of good data, that aphakia be corrected through the provision of best spherical correction rather than standard +10 spectacles.

4. Cataract cost

4.1 Cost and price

The cost of cataract surgery is recognized as an important barrier to uptake of services. This cost needs to be reduced through appropriate cost-containment measures including improved productivity and use of low-cost technologies. In countries where patients are required to pay for services, necessary provision should be made to subsidize the cost of surgery for the poor, either through government support, or through a variety of strategies for cost-recovery.

5. Operational Research

There are a number of important areas in which further operational research is required in order to define cost-effective strategies for delivering eye care and particularly cataract surgery.

It is recommended that studies be undertaken to investigate:

(a) the results and cost of different surgical techniques for cataract surgery in a variety of settings;

(b) strategies for cost-containment and cost-recovery which can be used in different settings, including government services;

(c) the barriers to uptake of eye care and cataract surgery and strategies to reduce these barriers;

(d) approaches to training and motivating health personnel, as a team, in planning and management of eye care services;

(e) the causes of poor visual outcome and how they can be addressed;

(f) the barriers experienced by eye care providers, and to devise strategies and incentives which will lead to improved output and quality.
ANNEX I

AGENDA

Opening of meeting
Election of Officers
Administrative announcements
Adoption of Agenda

1. Review of available results from national blindness prevention programmes
   - China
   - The Gambia
   - Morocco
   - Nepal
   - Thailand
   - Tunisia

2. Common issues and trends
   - coverage of national programmes
   - reduction achieved of blindness/low vision
   - update of eye care services
   - other matters

3. Outcome of cataract surgery; review of data
   - safety/efficacy
   - quality of services
   - quality of life
   - uptake of surgery
   - patient satisfaction

4. Future strategic issues
   - political and professional commitment
   - coverage; how to reach those most in need?
   - affordability; cost versus price for eye care
   - cataract surgery; offering a desirable product
   - epidemiological transition of eye diseases

5. Operations research and development of model programme

6. Planning for future evaluation schemes

Conclusions & Recommendations
ANNEX II

LIST OF PARTICIPANTS

Dr Alain Auzemery
Ophtalmologiste des Hôpitaux des Armées, Directeur, Institut d’Ophtalmologie tropicale de l’Afrique, B.P. 248, Bamako, Mali

Dr Leon B. Ellwein
Special Adviser to the Director, National Eye Institute, National Institutes of Health, 31 Center Drive, Building 31, Room 6A-08, Bethesda, Maryland 20892-2510, USA

Dr Hannah Faaal
Coordinator, National Eye Care Programme - The Gambia, Programme Consultant - West Africa, Sight Savers International, P.O. Box 950, Banjul, The Gambia

Dr Astrid Fletcher
Reader in Epidemiology, London School of Hygiene & Tropical Medicine, Department of Epidemiology and Population Sciences, Keppel Street, London WC1E 7HT, UK

Professor Gordon Johnson  (Vice-Chairperson)
Director, International Centre for Eye Health, Institute of Ophthalmology, 11-43 Bath Street, London EC1V 9EL, UK

Dr K. Konyama
Juntendo University School of Medicine, Department of Ophthalmology, 2-1-1 Hongo, Bunkyo-ku, Tokyo 113, Japan

Dr Carl Kupfer  (Chairperson)
Director, National Eye Institute, National Institutes of Health, Building 31, Room 6A-03, Bethesda, Maryland 20892-2510, USA

Dr Hans Limburg
Chief Adviser DANPCB, A1/148 Safdarjung Enclave, New Delhi 110029, India

Professor Yves Pouliquen
Université Paris VI, Hôtel Dieu, 1 place de Parvis Notre-Dame, 75004 Paris, France

Mr R. D. Thulasiraj  (Rapporteur)
Executive Director, Aravind Eye Hospital, 1 Anna Nagar, Madurai 625020, Tamil Nadu, India

NONGOVERNMENTAL ORGANIZATIONS

Ms Catherine Cross
Director, Overseas Programmes, Sight Savers International, Grosvenor Hall, Bolnore Road, Haywards Heath, West Sussex RH16 4BX, UK

Dr Allen Foster  (Rapporteur)
Medical Director, Christoffel-Blindenmission e.V., International Centre for Eye Health, Institute of Ophthalmology, 11-43 Bath Street, London EC1V 9EL, UK
Mr David Green  
Consultant, Al-Noor Foundation, 14 Cherrywood Ct., Hunt Valley, Maryland 21030, USA

Ms Marlene McAllister  
Health Care Consultant, Orbis International, Inc., 8311 S. Louisville, Tulsa, Oklahoma 74137, USA

Professor Akira Nakajima  
President, International Council of Ophthalmology, International Federation of Ophthalmological Societies, 1-41-12 Miyasaka, Setagaya-ku, Tokyo, 156 Japan

Professor Gottfried O. H. Naumann  
(Future President, International Council of Ophthalmology), Professor and Chairman, Augenklinik mit Poliklinik, Friedrich Alexander Universität Erlangen Nürnberg, Schwabachanlage 6, D-91054 Erlangen, Germany

Dr R. Pararajasegaram  
President, International Agency for the Prevention of Blindness, Grosvenor Hall, Bolnore Road, Haywards Heath, West Sussex RH16 4BX, UK

Dr Louis Pizzarello  
Medical Director, Helen Keller International, Inc., 90 Washington Street, 15th Floor, New York, NY 10006, USA

Ms Victoria Sheffield  
Executive Director, International Eye Foundation, Chair, Partnership Committee of Nongovernmental Organizations dedicated to the Prevention of Blindness and the Education and Rehabilitation of the Blind, 7801 Norfolk Avenue, Bethesda, Maryland 20814, USA

SECRETARIAT

Dr A.-Dominique Négrel  
Prevention of Blindness, Programme for the Prevention of Blindness and Deafness, World Health Organization, 1211 Geneva 27, Switzerland

Dr Serge Resnikoff  
Prevention of Blindness, Programme for the Prevention of Blindness and Deafness, World Health Organization, 1211 Geneva 27, Switzerland

Dr Juan Carlos Silva  
Regional Adviser, Blindness Prevention, Organizacion Panamericana de la Salud, Ministerio de Salud, Carera 13 N° 32-76 Edificio Uranio 5° Piso, Santafé de Bogota, Colombia

Dr Björn Thylefors  (Secretary)  
Director, Programme for the Prevention of Blindness and Deafness, World Health Organization, 1211 Geneva 27, Switzerland

Unable to attend:

Dr Howard Cohn  
Trustee, Helen Keller International, 45 rue Vineuse, 75016 Paris, France

Dr Akef El-Maghraby  
Chairman, El-Maghraby Eye Hospital, Jeddah-Khozzam St., Kilo 3, P.O. Box 7344, Jeddah 21462, Saudi Arabia
GUIDELINES TO MONITOR
THE OUTCOME OF CATARACT SURGERY

- The fundamental aim is to provide useful vision to the patient.

- Visual acuity must be measured in each eye of all patients undergoing cataract surgery for age-related cataract pre-operatively and any time between discharge and 12 weeks, using available correction, (and best correction). The following levels of visual outcome should be aimed for:

<table>
<thead>
<tr>
<th>Postoperative acuity</th>
<th>Available correction</th>
<th>Best correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good 20/20 - 20/40 6/6-6/18 10/10 - 3/10</td>
<td>80% +</td>
<td>90% +</td>
</tr>
<tr>
<td>Borderline &lt;6/18-6/60 &lt;3/10 - 1/10</td>
<td>15% -</td>
<td>5% -</td>
</tr>
<tr>
<td>Poor &lt;20/200 &lt;6/60 &lt;1/10</td>
<td>5% -</td>
<td>5% -</td>
</tr>
</tbody>
</table>

* * *