5 The Framingham Study, NIH 74-599. Bethesda: USHEW NIH, 1968.
6 National Center for Health Statistics (US). Blood pressure of adults by age and sex, United States, 1960–1962. USHEW, Public Health Service, 1964.
7 Kannel WB, Gordon T, Schwartz MJ. Systolic versus diastolic blood pressure and risk of coronary heart disease; the Framingham study. *Am J Cardiol* 1971; **27:** 335–46.
8 Cooperative Research. Prevention of stroke by antihypertensive drug treatment in older persons with isolated systolic hypertension: final report of the Systolic Hypertension in the Elderly Program (SHEP). *JAMA* 1991; **275:** 1557–62.
9 The SHEP Group. Prevention of heart failure by antihypertensive drug treatment in older persons with isolated systolic hypertension. *JAMA* 1997; **278:** 212–16.
10 Psaty BM, Smith NL, Siscovick DS, et al. Health outcomes associated with antihypertensive therapies used as first line agents. *JAMA* 1997; **277:** 739–45.
11 Borghi C, Ambosioni E. Evidence based medicine and ACE inhibition. *J Cardiovasc Pharmacol* 1998; **32** (suppl 2): S24–35.

Cost-effectiveness of public-funded options for cataract surgery in Mysore, India

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Summary

Background In India 3·8 million people become blind due to cataracts every year. We assessed the cost-effectiveness of public-funded options for delivering cataract surgery in Mysore, Karnataka State, India.

Methods Three types of delivery of cataract surgery were studied: mobile government camps, walk-in services at a state medical college hospital, and patients transported in from satellite clinics to a non-governmental hospital. We assessed outcomes in a systematic sample of patients operated on in 1996–97 by follow-up at home; average costs by provider derived from actual expenditures during the year.

Findings Almost half the patients operated on in government camps were dissatisfied with the outcome (34/70, 49% [95% CI 36–61]). More than one third were blind in the operated eye (25/70, 36% [25–48]). User satisfaction was higher with other providers (medical college hospital 82% [63–94]; non-government hospital 85% [72–93]), and fewer patients remained blind. Camps were a low-cost option, but the poor outcomes reduced their cost-effectiveness to US$97 per patient. The state medical college hospital was least cost-effective, at US$176 per patient, and the non-governmental hospital was the most cost-effective at US$54 per patient.

Interpretation The government of India should review its policy for government camp surgery, and consider alternatives, such as transporting patients to better permanent facilities. India and other developing countries should monitor outcomes in cataract surgery programmes, as well as throughput.

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See Commentary page 158

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Introduction

The 8·9 million blind people in India account for 24% of blindness worldwide, and increased life-expectancy in the country means 3·8 million people become blind due to cataracts every year.[1,2] The National Blindness Control Programme started in 1976, but technical, logistical, and funding problems impaired its effectiveness. The Indian government renewed efforts in 1993–94 with a US$118 million World Bank credit. As cataracts cause 50–80% of the blindness,[3,4] the government aimed to expand cataract-surgery coverage to the disadvantaged, and improve its quality, and thus reduce the prevalence of blindness.[5] Funds are now allocated to District Blindness Control Societies, which are autonomous legal entities at the district level. These societies have the flexibility to finance different providers, and therefore influence the mix of services available to low-income groups.

Mobile camps are an important component of these services for people in rural areas, where surgical teams establish temporary operating services in improvised facilities. They are considered to be cheap, efficient, and accessible to the rural poor. Societies also provide funds to non-governmental providers for cataract surgery.

Total national cataract throughput has increased from 1·2 million in 1991–92 to about 2·7 million cataract operations in 1996–97,[6] but little is known about comparative cost-effectiveness of the various providers. We therefore compared the outcomes, costs, and cost-effectiveness of the three most widely used public-funded strategies for the provision of cataract surgery in one district in Karnataka.

Patients and methods

Patients

Karnataka State is in the south-west of India, has a population of 45 million (1991 national census), and for selected indicators of social health, ranks high nationally. The Danish Government are helping implement the Karnataka project; in the seven other Indian states supported by the World Bank, the government is managing project implementation. We selected Karnataka because it was one of the first to establish blindness-control societies, and because the project is widely regarded as a model example of the National Blindness Control Programme.

Out of a total of 19 districts, we identified six that achieved 80–100% cataract-surgery targets in 1996–97. Of these six districts, we selected one at random for study, which was Mysore. In this location, the programme supported: the state medical

	Total operated 1996/97	Sampled but not seen*	Total patients seen	Patients satisfied with outcome (%, 95% CI)	Patients blind in operated eye
Government camp					
ICCE/ECCE	1084	18	70	36 (51%, 39–64)	25
State medical college					
ICCE/ECCE	798	8	28	23 (82%, 63–94)	4
IOL	404	5	21	20 (95%, 76–100)	0
Non-governmental hospital					
ICCE/ECCE	1173	13	53	45 (85%, 72–93)	5
IOL	1566	15	73	71 (93%, 90–99)	2

*Patients from other districts were excluded at sampling; patients not traceable were replaced.

Table 1: **User satisfaction by provider and type of operation**

college (which also functioned as a district hospital); government camps, organised by the community, with surgery done locally in impoverished surroundings by government staff from the district mobile unit; a non-governmental hospital, supported by funds and a board of management from the Mysore Race Course Club. The hospital provided surgery, and also ran screening camps in remote areas, transporting those patients in need of surgery to the hospital.

Procedures

Previous studies[7,8] have measured outcomes in patients attending follow-up. Their results are likely to be biased because the blind and the poor are less likely to attend, so in this study we followed ups of all operated patients in their homes. We identified surgical registers for each provider, and systematically sampled patients operated on from April, 1996, to March, 1997 (table 1). The sample size was calculated to ensure that differences in user satisfaction among the providers were detected. We interviewed patients in their homes with the help of two local anthropologists, and asked them about the success of the operation, and post-operative complications. Patients were asked if they were satisfied with the operation; their respective responses were categorised as: "happy/good vision", "vision better but not perfect", "little better/not satisfied", and "blind". Patients in the first two categories were classified as "satisfied with surgery". Patients who reported being blind were subsequently revisited with a senior ophthalmic surgeon in attendance, who reassessed their history, and post-operative visual acuity.[9–11]

The research ethics committee of the Liverpool School of Tropical Medicine approved protocols in regard to the protection of patients who participated in the study.

Costing analysis

Average costs were calculated from a societal perspective for the year 1996–97, by standard methods.[9–11] Total annual provider costs for each input to surgery (staff, land and buildings, equipment, transport, supplies, and maintenance) were calculated and divided by the number of patients treated for average costs. Data sources included published income and expenditure records, interviews with staff, quotations from suppliers of vehicles and equipment, wage bills, fuel consumption, and vehicle logbooks. Capital items we counted as an annual cost according to the current or replacement costs associated with each item, with a discount rate of 10%, and we assumed that the anticipated life expectancy of buildings was 30 years and vehicles and equipment 5 years. The total value of land was based on the government register of current sales of land and its annual cost was found by its opportunity cost at an annual rate of interest of 10%.[9] Allocation of joint costs was based on the following: the proportion of time staff spent on cataract surgery (staff component); the proportion of patient days accounted for by cataract patients (hospital overhead component); and the proportion of total miles travelled that had been accounted for by cataract surgery (vehicles component). We recorded expenditure on food, medicines, spectacles, tips and bribes, transport, hospital fees, and wages lost by the patient and any attendants during and after the period of surgery, to calculate the average cost per patient.

	Government camp	Medical college hospital	Non-governmental hospital
Patient costs*	334	1098	694
Provider costs	1465	4109	1074
Total unit cost†			
Rs	1798	5189	1639
US$	50	144	46
User satisfaction‡	51·4	82·1	84·9
Cost-effectiveness			
Rs	3500	6320	1931
US$	97	176	54

*Interviews with 151 patients (28 medical college hospital; 70 government mobile camp; and 53 non-government hospital). †Hospital fees included in patient costs deducted from total to avoid counting twice. Conversion rate: US$1=Rs36, approximate for 1996–97. ‡From table 1.

Table 2: **Cost-effectiveness of cataract surgery (costs per operation in Indian rupees)**

Community costs were estimated for mobile camps. The organisers' costs for patients' board and lodging, and publicity to inform prospective patients about the existence of the camps were collected from five randomly selected camps held in 1996–97 and averaged. The opportunity cost of three main members of the host organisation responsible for organising the camps were found on the basis of daily income in their fulltime occupation and charged to the camp.

Satisfaction with surgery from the user survey was used as the primary measure of effectiveness and cost-effectiveness calculated by multiplying the average cost by 100 and dividing the result by the percentage of patients satisfied with surgery. The estimation of cost-effectiveness was done only for conventional surgery—intracapsular cataract extraction (ICCE) and extracapsular cataract extraction (ECCE) without intraocular lens (IOL) implants. IOL surgery was excluded from the costing analysis, to allow direct comparisons between the three providers in conventional surgery.

Sensitivity analysis was done to assess the strength of the results in relation to various realistic assumptions of the cost of land, throughput, and outcomes for the different providers.

Results

Interviews

We interviewed a total of 245 cataract patients (128 men and 117 women) by field visits to more than 200 villages located within 100 km of Mysore city. Of the original sample, 37 were excluded as they came from other districts, four had died, 33 had incomplete addresses, ten could not be found, three were not available for interview, and nine came from villages that were inaccessible (table 1). In these cases, the preceding or succeeding case on the record was taken up for interview. Each patient was given the opportunity to decline interview, but all chose to participate.

We examined the sample by place of residence and income, defining low income (in rupees) as less than Rs12 000 in rural areas, and Rs25 000 in urban areas. Rural dwellers made up 76% (188) of the sample, of whom 65% (123) were low income, and 40% (76) of these were from scheduled castes or tribes. Of the 57 urban dwellers, 55% (31) were low income, and 36% (21) of them were living in slums.

For 72% (176/245), this was their first cataract operation, and most (62%, 151/245) had ICCE. The rest had IOL implants, and this was more common in younger people (52% in people less than 60 years compared with 33% in people above 60); and in urban dwellers (61%, compared with 31% in rural people).

	Country	Setting	Methods	Outcome	Eyes blind/ total operations	Visual acuity <3/60 (95% CI)
Hospital surgery						
Salem[15] 1987	Kuwait	General hospital	Outpatient follow-up of 385/409 operations, at 12–18 months	Best corrected visual acuity	9/385	2·3% (1–4)
Egbert[16] 1991	Ghana	Outpatient surgery	Outpatient follow-up of 49/288 operations, at 12–29 months	Presenting acuity	10/49	20·4% (10–34)
Reidy[13] 1991	India	NGO	Follow-up community study at one year	Best corrected vision	2/80	2·5% (0·3–8)
Al Faran[17] 1990	Saudi Arabia	Specialist eye hospital	Outpatient follow-up	Presenting acuity	151/1520	9·9% (8·5–11·5)
S Asian cataract study[18] 1995	Nepal, India, Bangladesh	Eye hospitals	Multicentre randomised clinical trial at 6 weeks (ICCE results only)	Best corrected vision	8/310	2·5% (1–5)
Henning[19] 1992	Nepal	Eye hospital	Outpatient follow-up of 314/1000 patients at 1 month	Best corrected vision	4/314	1·3% (0·4–3)
Cook[20] 1996	Sierra Leone	Eye hospital	Outpatient follow-up at or before 4 weeks	Presenting acuity	220/1059	20·8% (18–23)
Prajna[21] 1998	India	NGO eye hospital	Randomised controlled trial, at 12 months	Standard+10 correction	19/1401	1·4% (0·8–2)
Zhao[22] 1998	China	Town, county, and tertiary hospitals	Population survey (cluster sampling) of men and women aged 50 years or older in rural areas	Presenting acuity	45/116	38·8% (30–48)
This study	India	Government and NGO hospitals	Follow-up community study at 6–18 months	Presenting acuity	11/175	6% (3–11)
Camp surgery						
Reidy[13] 1991	India	NGO	Follow-up community study at 1 year	Best corrected vision	19/404	4·7% (3–7)
Murthy[23] 1996	India	Government	Follow-up community study (no sampling procedure adopted)	Presenting acuity	22/143	15·4% (10–22)
Verma[7] 1996	India	Government	Camp follow-up at 6 weeks of 145/164 eyes	Presenting acuity	23/145	15·9% (10–22)
Hogweg[8] 1992	Nepal	Not known	Prospective study of previously operated patients attending eye camps, 1–10 years after surgery	Presenting acuity	22/303	7·3% (5–10)
Kapoor[24] 1999	India	NGO	Camp follow-up at 6 weeks of 1874/3274 ICCE surgeries (included here)	Best corrected vision	77/1874	4·1% (3–5)
Limburg[25] 1999	India	Camps	Camp follow-up at 6 weeks of 2362 eyes	Standard +10 correction	484/2362	20·5% (19–22)
This study	India	Government	Follow-up community study	Presenting acuity	25/70	35·7% (25–48)
Mixed camps/hospitals						
Pokharel[26] 1998	Nepal	Previously operated patients	Population survey (cluster sampling)	Presenting acuity	46/220	20·9% (27–43)
Dandona[27] 1999	India	Camps and hospitals	Population survey	Presenting acuity*	28/131	21·4% (14–28·4)
Limburg[25] 1999	India	Camps and hospitals	Rapid epidemiological assessment (no IOLs included)	Presenting acuity*	164/587	28·0% (24–32)

NGO=non-governmental organisation.*Visual acuity <6/60.

Table 3: **Studies that report cataract-surgery outcomes in developing countries**

Outcomes

Patients' satisfaction with IOL surgery was high, and similar between the non-governmental facility and the state medical college hospital (table 1). Satisfaction with conventional surgery was lower, but similar between these two providers. Some patients remained blind in the operated eye: 8% (4/49) in the medical college hospital, and 6% (7/126) in the non-governmental hospital.

Almost half the camp patients were dissatisifed with the outcome, and 36% (25/70) reported being blind after the operation. Stratification by whether patients were older than 60 years showed higher levels of dissatisfaction in older age groups undergoing ICCE in all three providers. Type of provider, type of surgery, and age were all significant predictors of poor outcome on logistic-regression analysis (camp surgery *vs* the rest: odds ratio 4·8 [95% CI 2·6–12·4]; ICCE *vs* IOL 4·9 [1·29–19·2]). Although, odds of poor outcomes for old patients were three times higher, there were significant variations among the three providers: 56·8% (25/44) of the old patients operated on in camps were dissatisfied in contrast with 25% (4/16) for the state medical college hospital and 16·2% (6/37) for the non-governmental provider (data on *The Lancet* website: http://www.thelancet.com)

We revisited 32 of the 36 patients who were blind accompanied by an ophthalmologist, who checked our findings, and attributed probable cause. He confirmed blindness in all cases. He assessed whether poor correction was a cause, and determined that it was a contributory cause in four cases. However, even with correction these patients were severely visually impaired. He judged the cause to be poor quality surgery in 21 (66%), poor quality postoperative care in five (16%), faulty case selection in four (12%), and uncertain without further investigation in two (6%). In the 21 cases where poor surgery was attributed, the underlying reason was classified as vitreous loss in four patients, retinal detachment in three, iridocyclitis in three, iris prolapse in two, corneal decompensation in two, and cystoid macular oedema in one patient. Six other diagnoses were associated with poor surgery. The blind patients were mostly from rural areas (32/36), and were poor; 26/32 had an income of less than Rs12 000 per annum. All four blind patients from the cities were below the urban poverty line.

Costs

The main costs for patients were food, transport, medicines, spectacles, and post-operative follow-up. Although official governmental policy is for free services at government hospitals, patients spend money on food, medicines, spectacles, tips and bribes. Patient costs at mobile camps were lowest (table 2).

Among providers, average costs were highest in the medical college hospital. Government camps and the non-governmental hospital were much lower (table 2), and the non-governmental hospital the lowest. The costs for staff at the medical college hospital were twice that of the camp (Rs1499 *vs* Rs780), and 5·7 times that of the non-governmental hospitals (Rs1499 *vs* Rs264). The spectacle costs for the medical college hospital were 7·4 times that of the camps and 3·2 times that of the non-governmental hospital. Medical college hospital land and buildings costs (Rs1895) were 7·3 times that of the non-governmental hospital (Rs258). Social mobilisation costs such as camp

publicity, and board and lodging of camp patients, accounted for 11% of the provider cost for in-reach camps provided by the non-governmental hospital and 14% for the mobile unit camps.

For total cost, government camps were inexpensive, but non-governmental provider was the most cost-effective (table 2). Sensitivity analysis showed that even with land costs at commercial rental rates, the non-governmental hospital remained more cost-effective than the other options. Only when the bed use of the state medical college was increased substantially from 21% (actual) to 80% (ideal), the cost-effectiveness became equivalent to the non-governmental hospital. The cost-effectiveness of the government camps was sensitive to the degree of satisfaction and the number of surgeries per camp. In camps with fewer than 23 surgeries the unit costs of surgery (Rs2343) exceeded even those of the non-governmental hospital. Camps become a cost-effective alternative only if 40 or more surgeries were done in a camp with a patient satisfaction level of 80%.

Discussion

We sampled carefully, follow-up was intensive, and the response rate high. We sought self-reported outcomes, on the assumption that there is a high correlation between a patient's subjective appreciation of improved sight and an objectively assessed visual acuity.[12,13] We also made sure that a specialist reviewed 32/36 people who reported blindness. Because we only revisited patients obviously blind at the first visit, we potentially underestimated the poor outcomes, as patients reporting "little better/not satisfied" were not seen by the surgeon.

We consider this an accurate estimate in this district, but we do not know how generalisable the findings are because we studied only one district. We identified this district by random selection from the six best performing districts out of a total of 19 in the state. In fact, the district is widely regarded as a model of care. The sample is from 1084 persons operated over the year by seven or eight clinicians working in teams of four to five in 27 separate camps. This suggests the findings reflect a failure of the system, and not the skills of any particular group of surgeons.

Uncomplicated cataract surgery is usually 95% successful,[14] but the poor outcomes in our study could be due to poor patient selection, or case mix. Blindness in India due to non-cataract causes is usually overlooked,[3] and patients remain blind if operated on. Similarly, operations on older people may have unsatisfactory outcomes. An additional analysis stratifying outcomes by age showed higher levels of dissatisfaction in older age groups, but this trend was consistent across all providers. This suggests that poor outcomes in camps was not simply the result of surgery being done on old people who had more complicated problems.

Camps were a low-cost option but the poor outcomes at camps reduced their cost-effectiveness. For the medical college hospital, we took into account their activities such as teaching and other surgical procedures in our costing, but still they were the least cost-effective. Probably the main reason for this was the low throughput. An interesting incidental finding was the high costs to patients at this facility: there were additional, unofficial costs of staff, and cost of spectacles was high, because they were given a prescription for a specified shop owned by a member of staff. In contrast, the camp patients get their first pair free while patients attending the non-governmental hospital obtained spectacles at cost price.

The poor surgical outcomes were a surprise, therefore we sought evidence for poor outcomes in other reports from developing countries. We searched MEDLINE on cataract surgery outcomes; hand searched the *British Journal of Ophthalmology* and *American Journal of Ophthalmology*, and followed up references. All studies used outpatient follow-up as the denominator, unlike our study that followed up patients operated on. For hospital surgery, outcomes varied greatly (table 3).[7,8,13,15–27] For camp surgery, three studies showed good outcomes, and three studies showed poor outcomes, but none as marked as in our study. It is not known how complete attendance at follow-up was, and this method may underestimate poor outcomes as blind people are less likely to attend. We avoided this in our study by following up at home all operated patients, at no cost to them.

The provider costs for the non-governmental provider (US$30) and government camp (US$41) compare well with those calculated in Nepal[28] (US$21) in 1991, given the price increase in the intervening 6 years.

Public health investment in cataract surgery is high in developing countries, and usually monitored by throughput and not quality. Our study highlights the need to establish systems to monitor and assure quality of cataract surgery. These findings have significant implications for WHO's "Vision 2020" initiative.[29] We have also shown that cataract surgery through an "in-reach" approach is cost-effective, where patients are screened in improvised outpatient satellite clinics, and brought in to a permanent good quality surgical facility by bus. The same model has also been applied successfully by Aravind Eye Institute in Madurai, India.[21] This approach could be used in a government system.

Our study shows that in this district the non-governmental hospital provides a more cost-effective service than government, and that the public money channelled through the district blindness-control societies to allow support of the non-governmental sector is in this case an efficient way of helping deliver basic care. Further development of this model seems appropriate, by development of methods for accrediting surgeons, facilities, and other providers by clearly laid down criteria.

Contributors

Amarjit Singh conceived the study, designed the survey, and analysed the results. Paul Garner developed the study and assisted at all stages of the design, analysis, and interpretation. Katherine Floyd contributed to the design and analysis of the cost data. All investigators contributed to redrafting of the paper.

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References

1 Thylefors B, Negrel AD, Parajasegram R, et al. Global data on blindness. *Bull World Health Organ* 1996; **74:** 319–24.

2 Minassian DC, Mehra V. 3.8 million blinded by cataract each year: projections from the first epidemiological study of incidence of cataract blindness in India. *Br J Ophthalmol* 1990; **74:** 341–43.

3 Dandona L, Dandona R, Naduvilath T, et al. Is current eye-care-policy focus almost exclusively on cataract adequate to deal with blindness in India? *Lancet* 1998; **351:** 1312–16.

4 Mohan M. Survey of blindness in India (1986–89)—Report to the Ministry of Health, Government of India. N Delhi, India: Government of India, 1992.

5 The World Bank. Cataract blindness control project—India. Staff appraisal report. Washington, DC: The World Bank, 1994.

6 Jose R. National programme for control of blindness. *Indian J Comm Health* 1997; **3:** 5–9.

7 Verma L, Gupta SK, Murthy GVS, Goyal M, Pant TD. A follow-up study on visual outcome after camp-based intracapsular cataract extraction. *Trop Med Int Health* 1996; **1:** 342–47.

8 Hogeweg M, Sapkota YK, Foster A. Acceptability of aphakic correction: results from Karnali eye camps in Nepal. *Acta Ophthalmol* 1992; **70:** 407–12.

9 Drummond MF, O'Brien B, Stoddart GL, et al. Methods for the economic evaluation of health care programmes. New York: Oxford University Press, 1997.

10 Gold MR, Siegel JE, Russel LB, Weinstein MC. Cost effectiveness in health and medicine. New York: Oxford University Press, 1996.

11 Drummond MF, Jefferson TO. Guidelines for authors and peer reviewers of economic submissions to the BMJ. *BMJ* 1996; **313:** 275–83.

12 Murthy GVS, Gupta SK. A community-based evaluation of eyesight and spectacle use after intra-capsular cataract extraction in northern India. *J Trop Med Hyg* 1995; **98:** 84–88.

13 Reidy A, Mehra V, Minassian D, et al. Outcome of cataract surgery in Central India: a longitudinal follow-up study. *Br J Ophthalmol* 1991; **75:** 102–05.

14 Powe NR, Schein OD, Giesar SC, et al. Synthesis of the literature on visual acuity and complications following cataract extraction with intraocular lens implantation. *Arch Ophthalmol* 1994; **112:** 239–52.

15 Salem MA, Ismael L. Factors influencing visual outcome after cataract extraction among Arabs in Kuwait. *Br J Ophthalmol* 1987; **71:** 458–61.

16 Egbert PR, Buchanan M. Results of extracapsular cataract surgery and intraocular lens implantation in Ghana. *Arch Ophthalmol* 1991; **109:** 1764–68.

17 Al Faran MF. Visual outcomes and complications after cataract extraction in Saudi Arabia. *Br J Ophthalmol* 1990; **74:** 141–43.

18 The South Asian Cataract Management Study Group. The South Asian cataract management study—1. The first 662 surgeries: a preliminary report. *Br J Ophthalmol* 1995; **79:** 1029–35.

19 Henning A, Shreshta BP, Foster A. Results and evaluation of high volume intra-capsular cataract extraction in Nepal. *Acta Ophthalmol* 1992; **70:** 402–06.

20 Cook NJ. Evaluation of high volume extracapsular extraction with posterior chamber lens implantation in Sierra Leone, West Africa. *Br J Ophthalmol* 1996; **80:** 698–701.

21 Prajna NV, Chandrakanth KS, Kim R, et al. The Madurai Intraocular Lens Study II: clinical outcomes. *Br J Ophthalmol* 1998; **125:** 14–25.

22 Zhao J, Sui R, Jia L, et al. Visual acuity and quality of life outcomes in patients with cataract in Shunyi county, China. *Am J Ophthalmol* 1998; **126:** 515–23.

23 Murthy GVS, Gupta SK, Talwar D. Assessment of cataract surgery in rural India. *Acta Ophthalmol* 1996; **74:** 60–63.

24 Kapoor H, Chatterjee A, Daniel R, et al. Evaluation of visual outcome of cataract surgery in an Indian eye camp. *Br J Ophthalmol* 1999; **83:** 343–46.

25 Limburg H, Foster A, Vaidyanathan K, et al. Monitoring visual outcome of cataract surgery in India. *Bull World Health Organ* 1999; **77:** 455–60.

26 Pokharel GP, Selvaraj S, Ellwien LB. Visual functioning and quality of life outcomes among operated and unoperated blind populations in Nepal. *Br J Ophthalmol* 1998; **82:** 606–10.

27 Dandona L, Dandona R, Naduvilath TJ, et al. Population-based assessment of the outcome of cataract surgery in an urban population in South India. *Am J Ophthalmol* 1999; **127:** 650–58.

28 Marseille E. Cost-effectiveness of cataract surgery in a public health eye care programme in Nepal. *Bull World Health Organ* 1996; **74:** 319–24.

29 Pararajasegaram R. VISION 2020—the right to sight: from strategies to action. *Am J Ophthalmol* 1999; **128:** 359–60.