

# 2004/05 ICEH Community Eye Health MSc

Adrienne Burroughs



The ICEH Community Eye Health class of 2004/05. UK

All ICEH MSc students carry out a dissertation project as part of the CEH course. They spend ten weeks dedicated to the project (five for field work and five for write up), and the planning is conducted throughout the year. The dissertation is about 10,000 words and requires a disciplined and dedicated approach. It is prepared in stages: the student identifies an area of interest and then carries out a literature search on the topic before finally deciding on the research question. The next stage includes designing the most appropriate methodology to answer the research question. Feasibility within the specified time frame and budget are important considerations. Students then have to seek ethical permission to carry out the project. Often the field work requires a team and students have to identify and train their own team for the project. This is then followed by the field work, data management and analysis and final write-up. At the end of this process, the students are equipped to carry out research independently in their regions.

Most of the dissertations are excellent pieces of original and valuable research work. The summaries below provide some insight into the work carried out by the students at ICEH in the academic year 2004/05. Often the recommendations from dissertations get translated into action plans to reduce the burden of blindness in their communities. We consider the project work as the most important component of the learning process in our MSc course.

## Effectiveness of cycloplegic drugs in Nigerian children



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**Aim:** To compare the cycloplegic effectiveness and cost of cyclopentolate 1%, atropine 1% and a combination of 1% cyclopentolate and 0.5% tropicamide in Nigerian children undergoing examination for refractive errors.

**Methods:** A single-masked randomised controlled clinical trial. A total of 255 children aged between four and 15 years with complaints of poor vision, attending outpatient eye clinics of Mercy Hospital and General Hospital in Nigeria, were enrolled in the study.

Two hundred and thirty three children met the selection criteria and were randomised to three groups. In the first group, children were given 1% atropine drops in each eye to be instilled at home, three times daily for three days, and examination was carried out on day three. In the second group, children were given one drop of cyclopentolate and this was repeated again five minutes later. In the third group, using a similar regime, the children received a combination of cyclopentolate and tropicamide. Children in the second and third groups were examined 30 minutes after the first drops.

The accommodative responses of each group were assessed by:

- the amount of residual accommodation calculated as the difference between spherical equivalents of retinoscopy findings obtained at two distances (6 & 0.33 metres)
- the size of dilated pupils and response to light.

**Results:** Atropine was the most effective with the least mean residual accommodation (0.04 +/- 0.11 Dioptres), followed by the combined regimen (0.36 +/- 0.42 Dioptres). 1% cyclopentolate was the least effective (0.63 +/- 0.51 Dioptres). Also, the pupils of 96 per cent children who received atropine showed adequate cycloplegia compared to 66.2 per cent in the combined group and 15.8 per cent in the cyclopentolate group.

**Conclusions:** Atropine (1%) is the most effective agent, but it is not ideal. The cost-effective and better tolerated alternative was the combination of cyclopentolate (1%) and tropicamide (0.5%).

## Blind school survey in Plateau, Bauchi and Kaduna States, Nigeria



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**Aims:** To assess the causes and distribution of childhood blindness, the proportion of avoidable blindness, and to assess educational facilities available to blind students in Plateau, Bauchi and Kaduna States, Nigeria.

**Methods:** This was a descriptive, cross-sectional survey of three blind schools located in Northern Nigeria. It had a quantitative and a qualitative component. The study instrument used was the WHO/PBL Childhood Blindness Proforma. The qualitative component involved an in-depth interview with principals, teachers and children. The data was analysed using the thematic framework analytical approach.

**Results:** Of the 199 students currently enrolled in the schools, 181 (91 per cent) were examined. Their age ranged from five to 17 years, 101 (56 per cent) were aged less than 16 years. 128 (70 per cent) were males. 167 (92 per cent) had severe visual impairment/blindness and seven (4 per cent) had normal vision. The main anatomical site of abnormality leading to severe visual impairment or blindness among students under 16 years of age were the lens (26 cases – 29 per cent), whole globe (23 cases – 26 per cent) and cornea (18 cases – 20 per cent). Corneal scar however, remained the single most important identifiable cause of childhood blindness (15 cases – 17 per cent). Diseases of unknown aetiology (41 cases – 46 per cent) were the main cause of visual loss among children under 16 years of age. Sixty eight children (67 per cent) had become blind due to avoidable causes. Problems identified in the special education system included lack of adequate funding and learning materials.

**Conclusions:** The childhood period (1-15 years) remains the most critical period for the onset of blindness. A significant proportion of blind children can be helped with surgical and optical intervention. There is less emphasis on the education of female children who are blind and integrated education is not currently practiced at primary school level. The community is still ignorant of the capabilities of children who are blind.

## Visual impairment in mentally handicapped patients in The Gambia



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**Aims:** To establish the prevalence and causes of visual impairment amongst a cross-section of people with a mental handicap as a vulnerable group in The Gambia.

# Dissertation Summaries

**Methods:** Consecutive patients attending the psychiatric unit of Royal Victoria Hospital clinic within three weeks of the study were recruited. They underwent a visual acuity assessment using logMAR charts followed by an ophthalmic examination to establish the possible cause of visual impairment. Visual impairment was defined as a presenting logMAR acuity of  $>0.499$  corresponding to a Snellen acuity of  $<6/18$  and blindness as logMAR acuity  $>1.3$  ( $<3/60$ ) in both eyes.

**Results:** The prevalence of visual impairment was found to be 1.96 per cent (95 per cent, Confidence Interval (CI): 1.0 per cent-4.0 per cent), which was similar to the population prevalence in 1996. Blindness accounted for 0.56 per cent (95 per cent, CI: 0.2 per cent-2.0 per cent) and low vision 1.4 per cent (95 per cent, CI: 0.6 per cent-3.2 per cent). The major causes of visual impairment were refractive error (54.2 per cent) and cataract (33.3 per cent).

**Conclusions:** There are limitations to comparing these findings to the national prevalence, as this was a hospital-based group. The mentally handicapped population remains a vulnerable group, which does need the attention of eye care services.

## Validating key informant method in detecting blind children in Ghana



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**Aims:** To provide information on the prevalence and causes of blindness in children in Ghana.

**Methods:** Seventy key informants were trained to identify children who are blind within the district. For the purpose of the study blindness was defined as visual acuity of less than 6/60 in the better eye with the available correction. The key informants went into their communities for two weeks, identified the children who could not count fingers at 6 metres or those who could not fix on bright objects and whose parents reported that the children did not see, and referred them to the ophthalmologist for examination.

**Results:** The 70 key informants screened about 23,000 children in the district out of which 31 were referred to the ophthalmologist for examination. Fifteen were blind bilaterally, 15 had vision less than 3/60 in one eye and one had visual impairment (less than 6/60 in the better eye). The prevalence of childhood blindness in the study sample was found to be 0.074 per cent (95 per cent, CI 0.043 to 0.118 per cent). The magnitude of childhood blindness in Akuapim South was found to be 30 blind children. With 95 per cent CI results the range of childhood blindness in the district would be between 17 and 47 blind children. Using this information, it can be extrapolated using the CI range that there would be about 6,735 blind children in Ghana. The main causes of blindness in these children were found to be retina-related and cataract.

**Conclusions:** The key informant method is an effective way of surveying childhood blindness in Africa. It allowed us to screen a large number of children in a short period of time.

## Evaluation of the impact of Nyateros “Friends of the eye” in the delivery of eye care services after one year of its implementation in Lower River Division, The Gambia



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*Nyateros* are local women, identified by their communities after consultations with all stakeholders, who promote eye health and play a vital role in the early identification of cases and referral. This

strategy is used by The Gambia National Eye Care Programme. It is based on the idea that for every 250 people, the community will identify one individual who will be responsible for the eye health of these people.

**Aims:** To critically determine whether the use of *nyateros* in the eye care programme would increase efficiency and bridge the gap between the community, community understanding and the service providers at primary, secondary and tertiary level.

**Methods:** Quantitative methods included a desk evaluation of the key performance statistic registers from all *nyateros* in the field, identified primary centres for comparison, and mapped out active and inactive referrals from *nyateros* stations according to the number of patient referrals to eye care services. Qualitative interviews reviewed the acceptability and the impact of *nyateros* in a community. Interviews were also conducted to identify the challenges faced by the *nyateros* in carrying out their task.

**Results:** There were 150 *nyateros* trained in 2002 and 145 were active in the field in 2004. In the two years, numbers of referrals to health centres from *nyateros* had increased five-fold. The majority of the referrals were for cataract surgery.

The *nyateros* continue to have difficulties in referring patients due to lack of transport and cost. The community appreciate the *nyateros* and would like to see their activities extended to other health services. Some internal management and motivational issues were highlighted and require attention.

**Conclusions:** The *nyateros* have been successful in bridging the gap between the community and the service providers but some practical issues such as distance from health centres and lack of drugs at these centres demotivate them. The current coverage is not sufficient and another 540 *nyateros* would still be required. Secondary units and health centre should be strengthened to support *nyateros* activity.

## Factors predisposing to Vitamin A deficiency (VAD) in two populations in Tanzania



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**Aims:** To determine the socio-economic factors which predispose populations of Kilombero and Manyoni in Tanzania to VAD. The selection was based on the 1997 National Vitamin A survey, whereby Manyoni had the lowest and Kilombero had the highest prevalence of VAD (17 per cent and 56 per cent respectively) in the country.

**Methods:** Qualitative research methods, namely interviews with women in 60 households and one focus group discussion at each village to explore social behaviours and childrearing practices. A questionnaire was used to identify infant and child feeding practices and availability of vitamin A food.

**Results:** The main predisposing factors found in these communities are:

- Childrearing practices. For example, exclusive breastfeeding up to six months was carried out by 50 per cent in Manyoni mothers but by only 7 per cent of mothers in Kilombero
- Early weaning practices. For example, in Manyoni 73 per cent of the children were weaned at four to six months, whereas in Kilombero first food can be started as early as one week and 93 per cent were weaned before four months
- Feeding infants with vitamin A rich food was one of the factors that lowered rates of VAD. Eighty three per cent of Manyoni women added a vitamin A rich food into the baby's staple diet compared to 40 per cent of women in Kilombero
- Food taboos related to vitamin A food. In Manyoni, 7 per cent of households indicated that food taboo is a factor leading to VAD. In Kilombero 50 per cent of households acknowledge food taboos

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related to a vitamin A food. These taboos prohibited the use of foods such as eggs, fish, goat's meat and papaya being given to pregnant women and young children

- The availability of food rich in vitamin A, like mango and papaya, were not an indicator of a reduced VAD in the community. Surprisingly, it was the opposite. In the case of Kilombero there was 100 per cent availability of vitamin A rich food, while in Manyoni only 3 per cent reported these foods as being readily available
- There were no significant economic differences in these communities to predispose the people to VAD.

**Conclusions:** From this study we can conclude that childrearing practice, practice of exclusive breastfeeding and food taboos can determine the prevalence of VAD in different communities as seen in these two populations. Availability of vitamin A rich food in communities is not a factor contributing to lower rates of VAD, as demonstrated in the community of Kilombero where availability of fruits to each household child was 100 per cent and yet they had the highest prevalence of VAD in the 1997 national survey.

## Cost-utility and visual outcomes of bilateral cataract surgery in outreach programmes in India



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**Aim:** To determine the appropriateness of different intervention strategies for bilateral cataract in terms of costs and outcomes.

**Methods:** Retrospective study of patients operated through outreach programmes during the period 2003-05. The pre-operative and post-operative visual acuities of eligible patients were recorded and assigned into three intervention groups based on i) number of hospital admissions and ii) surgical intervention in either one or two eyes. The groups are 'one admission one eye', 'one admission two eyes' and 'two admissions two eyes'. The visual acuities were incorporated with the time-tradeoff utilities of GC Brown. Cost-utility analysis was performed on each intervention group. The comparison of outcomes in terms of visual acuities was done.

**Main Outcome Measures:** The number of quality-adjusted life years (QALYs) gained was calculated for each group. The cost of each group was divided with the respective QALY gained to get the dollars spent for gain of each QALY.

**Results:** The intervention of 'one admission two eyes' as compared to the other two interventions was found to be most cost-effective. The mean undiscounted QALY gain was 1.69 at a cost of US\$28.53 (US\$16.82/QALY). The 'one admission one eye' group resulted in 1.216 QALY gain at a cost of US\$20.72 (US\$17.06/QALY). The 'two admissions two eye' group was found to be more expensive and less effective with a QALY gain of 1.14 at a cost of US\$41.85 (US\$36.38/QALY). Sensitivity analysis, varying costs and QALYs revealed that the interventions are significantly sensitive to costs and QALYs.

**Conclusions:** Intervention of cataract on two eyes of bilateral cataract patients mobilised through outreach programs was cost-effective. The long-term benefits of such an intervention to patient, provider and to society indicate re-orientation of present strategies in countries such as India where sufficient infrastructure is in place.

## Visual impairment among people under 50 years of age in Coimbatore District, India. A pilot survey of needs and resources



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**Aims:** The study aimed at piloting an assessment of the prevalence and causes of visual impairment in children (age 0-15) and the economically productive age group (16-49) through a population-based survey in Coimbatore District, South India. The second aim

was to match the needs of the visually impaired individuals identified through the survey with available resources and to propose strategies for bridging the gaps.

**Methods:** 2,800 people were surveyed in three randomly selected blocks of the district, the sample being selected as clusters of 50 persons, by probability proportional to size procedure.

**Results:** 0.75 per cent (21/2800) of the population was visually impaired (vision <6/18 at 6 metres, with available correction and both eyes open). The prevalence of blindness (vision <3/60) was 0.14 per cent. Among children (under 15 years), the prevalence of visual impairment (<6/18, presenting binocular acuity) was 0.1 per cent. The prevalence amongst the 15-49 years age group was 0.6 per cent. Refractive errors contributed to at least 47 per cent of the impairment (10/21). Resources were adequate only for the needs relating to 'activities of daily living' and 'self-care', and to clinical care.

**Conclusions:** Efforts to identify the visually impaired, assess their needs and abilities and then tailor individual strategies for their rehabilitation should be through inter-sectoral co-operation and collaboration between the various services. A comprehensive database of resources should be compiled, and this information should be made widely and readily available. Pressure groups comprising of service providers and beneficiaries could empower the visually impaired to access the benefits they are entitled to. Middle level ophthalmic personnel should receive training updates, and be provided with basic equipment, which they are taught to maintain.

## Corneal ulcers in the Eastern Region of Nepal



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**Aim:** To describe existing management practices for corneal injuries and suppurative keratitis and to identify barriers to uptake of these services in the Eastern Region of Nepal.

**Methods:** A retrospective analysis of data from 222 corneal ulcer patients examined at Mechi Eye Care Study in a one-year period (Dec 2001-Nov 2002). For prospective qualitative study, we used a non-probabilistic, purposive sampling method to include study participants from service provider groups (medical shopkeepers, traditional healers, health care providers, ophthalmologists, ophthalmic assistants, and eye care managers). All patients with suppurative keratitis during the study period were interviewed in this study. Structured interviews, semi-structured interviews, focus group discussions, and in-depth interviews were carried out with study participants.

**Results:** Corneal ulceration was more common in males, farmers, and the productive age groups. The majority of patients were seen during the season of peak agricultural activity. Nearly half of patients came to the eye hospital after one week and one third presented after three weeks from the start of symptoms. Nearly two thirds of patients had sought medical and non-medical help before coming to eye hospitals and 57 per cent were using traditional eye medicines. Patient accessibility to eye care services was the main barrier for early consultation, followed by cost, social beliefs, and ignorance about the disease. The main barrier from the service provider group for corneal ulcer management was lack of diagnostic facilities. A cataract-oriented eye programme and the relatively fewer number of corneal ulcer patients in the existing tertiary eye hospitals could be responsible for lack of development of laboratory facilities in these hospitals.

**Conclusions:** This study emphasised the need for a corneal ulcer prevention programme in the Eastern Region of Nepal which includes a public health education campaign regarding preventive aspects of corneal ulceration, training of health workers and traditional healers, establishing secondary eye care centres in coordination with government health structure, and upgrading of diagnostic facility of corneal ulcer in the existing tertiary eye care centres.

## Knowledge, attitudes and beliefs concerning visual impairment and eye care services in the State of Chihuahua, Mexico



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**Aims:** To identify the level of knowledge about blindness and visual impairment in the population of Chihuahua and the impact of health education programmes. To identify the attitudes and practices related to uptake of eye care services and how the providers deal with it. This will allow better planning and delivery of services.

**Methods:** An exploratory study using qualitative methods. Focus group discussions and semi-structured interviews were conducted with various community groups (teachers, church leaders, parents and employees of enterprises), patient groups (waiting in eye clinics) and health care providers (doctors, optometrists and nurses). This information was then analysed using a thematic framework.

**Findings:** The key findings were:

- poor understanding of blindness and its cause. As a result there were tendencies to try out traditional remedies and wait till the disease worsens before seeking help
- cost was identified as another barrier
- the impact of health education for diabetes and glaucoma shows that messages were heard but not understood.

**Conclusions:** This data shows that there is a lack of awareness of blindness and visual impairment. Certain eye conditions need to be understood by the community, therefore eye health promotion activities and strong primary health care (PHC) are important. The project recommends strengthening links to PHC by training primary health and primary eye care professionals to improve the service.

## Developing a glaucoma management programme in Belize



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**Aim:** To propose strategies to develop a glaucoma management programme in Belize.

**Methods:** Statistical analysis of a data set from a cross-sectional study from 2002 was used to estimate the prevalence of glaucoma. Thematic analysis and interpretation of qualitative data from a separate study identified barriers in the community. Quantitative and qualitative fieldwork to assess human resources and currently available eye care services was undertaken.

**Results:** The prevalence of blindness was 3 per cent. Glaucoma is the major cause of blindness accounting for two thirds of the total blindness. The prevalence of glaucoma in people of African descent who are 40 years and above is estimated to be 9 per cent. The study identified poor awareness and understanding of eye care and the strong role of traditional medicine as the main barriers in the community. A lack of skills and knowledge and the availability of appropriate treatment were identified as barriers amongst service providers.

**Conclusions:** Proposed strategies include human resources development, increasing the available treatment options and developing an appropriate programme for glaucoma.

## Understanding health-seeking behaviour of patients with diabetic retinopathy



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**Aim:** To identify the barriers to diabetic eye care services in England from both the patients' and health service providers' perspectives.

In the UK, despite the development of screening services, there are still some diabetic patients that present with advanced sight-threatening disease, which is difficult to treat.

**Methods:** A qualitative methodology was used to explore the subject matter, as there were no relevant studies published in the UK. The principal investigator undertook six hours of non-participatory observation in the waiting areas of clinics in a district general hospital and at a tertiary referral centre. Twenty 'information-rich' patients were identified to take part in semi-structured in-depth interviews. 'Information-rich' patients were those patients who had developed sight-threatening proliferative retinopathy in the last two years, and who had initially presented as such, or after a period of non-attendance at clinic. Ten other patients who had received timely treatment for diabetic retinopathy were also interviewed for triangulation purposes. Three focus groups of patients using the diabetic eye services and one focus group of diabetic patients in the community were undertaken. A wide range of health care staff in the community services and the tertiary eye hospital were interviewed about their perceptions of barriers to patients. All interview and focus groups were recorded digitally and transcribed. Analysis of transcriptions was by grounded theory.

**Findings:** General lack of awareness of the ocular complications of diabetes amongst diabetic patients was noted. More specifically, we identified a lack of knowledge about the severity and symptomless nature of the condition prior to significant loss of sight. This gap in patient education was explained by the fact that health professionals in the community are not specific about eye complications and their severity and that hospital professionals refrain from engaging with general diabetic issues.

**Conclusions:** The most common barrier to eye care services for diabetic patients was both a general and specific lack of knowledge of the complications and severity of diabetic retinopathy.

## Blinding trachoma in Kabale district, South Western Uganda. A rapid assessment in the four sub-counties of Kamwezi, Buhara, Rubaya and Mutanga



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**Aims:** To establish whether or not blinding trachoma exists in sub-counties of Kabale district in South Western Uganda, using the purposive rapid assessment. All identified patients would be mapped and the area examined for risk factors.

**Methods:** The study was conducted in the four sub-counties of Kamwezi, Buhara, Rubaya and Mutanda, the selection of which was based on anecdotal information about the likely areas where cases of trichiasis and entropion exist. For each sub-county, all patients who were blind and visually impaired due to in-turned eyelashes rubbing on the eye associated with a chronic eye discharge were urged to come for examination. Eye examination included: visual acuity assessment; external examination of the eye for trichiasis; entropion detection; assessment of corneal opacities; and any other relevant examination to establish the nature of ocular morbidity. All those patients aged 15 years and over with trichiasis were probed further on history of the disease and their area of residence was mapped. These areas were then visited to assess for evidence of active trachoma amongst children aged one to nine years. An assessment of the likely risk factors for the spread of trachoma was also considered.

**Results:** A total of 456 patients responded to the recruitment exercise, out of which 289 (63 per cent) were females. A total of 41 cases of entropion and trichiasis were identified. 31 were from Uganda and ten were from neighbouring Rwanda. Three out of the four sub-counties had trichiasis, with Kamwezi leading with 16 cases, Mutanda nine cases and Rubaya six cases. No cases were identified in Buhara subcounty. The results of active trachoma assessment

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(proportion of children with TF) showed that Kamwezi had the highest (20 per cent), followed by Mutanda (14 per cent) and Rubaya (8 per cent). Notable among the risk factors in these areas was the distance from water sources due to the very difficult terrain.

**Conclusions:** From the above findings, it can be concluded that blinding trachoma is present in some areas of Kabale district and there is evidence of active infection among the population. It is recommended that a wider population-based survey be done to get more information on the extent of the problem in other areas so that treatment and control measures, non-existent at the moment, can be put in place.

## **Evaluating retinopathy of prematurity services in South Africa**



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**Aims:** To conduct a situation analysis of retinopathy of prematurity (ROP) in South Africa. The study aimed to establish the number of babies at risk of blindness and the need for ROP screening services. South Africa is a middle-income country with an expanding neonatal service. Similar countries are experiencing what has been termed the third epidemic of ROP. This has been characterised by blindness in larger, more mature babies than in high-income countries.

**Methods:** A sample of neonatal nurseries (private and public) were visited to study the infrastructure, staffing, policies and practices regarding ventilation and oxygen. Data was collected on ROP screening policies, practices, and results of screening. The survival of low birthweight babies was explored using data from individual nurseries and from government reports. Babies were classified as: low birthweight <2500 g; very low birthweight <1500 g; and extremely low birthweight <1000 g.

**Results:** Infrastructure in South Africa is adequate to provide care for babies above 1000 g and 90 per cent of them survive. Babies below 1000 g are not ventilated routinely in public hospitals but 50 per cent of babies reaching secondary care units do survive. Staffing is adequate, standards of neonatal care are high, but continuous monitoring of all babies on oxygen is not done universally because of a shortage of monitors. ROP screening is presently being done in a minority of public hospitals. In hospitals where the results of screening are available, sight-threatening ROP is low (0.6-2.9 per cent). Most babies needing treatment were below 1,200 g.

**Conclusions:** ROP may be a small proportion of the childhood blindness at present but it is likely to increase as neonatal care becomes available to the majority of the population. Screening programmes need to be instituted in all institutions with individualised screening guidelines. For this an increase in trained personnel is required.

## **Why people do not come for cataract surgery in Nakuru, Kenya**



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**Aim:** To describe the barriers to uptake of cataract services in Nakuru, Kenya and to make recommendations on how to overcome the barriers.

**Methods:** A population-based survey (rapid assessment for avoidable blindness) identified 229 patients needing cataract surgery. Of those, 91 had had cataract surgery but 138 had not accepted surgery despite being recommended to do so. All 138 non-acceptors were interviewed using Barriers to Surgery Questionnaire and each person gave four reasons for not taking up the surgery.

**Results:** There were no statistical significant differences between age, sex and place of residence as being risk factors for not accepting surgery. This was a surprise as often elderly women are seen to be at higher risk of being blind from cataract. The main barrier for not taking up surgery was lack of awareness followed by cost and being able to manage with one eye.

**Conclusions:** Health education campaigns are necessary to persuade people in Nakuru to take up surgery. Experiences from other countries show that this is possible and can prevent people in the community remaining blind from a treatable cause.