

# Setting up an Eye Service in the Republic of Benin

**Andrew R Potter**  
**MA MRCGP MRCOphth**  
**DTM&H**  
**BP 924**  
**Parakou**  
**Benin, Africa**

## Objective

The reason for writing this paper is to record the evolution of a new eye service in a West African country. Some of the problems encountered are discussed.

## Introduction

The Republic of Benin, formerly Dahomey, is situated on the west coast of Africa, bordered by Nigeria to the east, Togo to the west and Burkina Faso and Niger to the north. Benin is less than half the size of the United Kingdom (112,622 km<sup>2</sup>), with a population of around five million,<sup>1</sup> 64% living in rural areas. Life expectancy is estimated at 54 years. The gross national product was 370 US \$ per head in 1994.

Health care is provided by the government medical service through hospitals and bedded dispensaries in the towns, by a network of independent and church-based

hospitals and by private practitioners (doctors and nurses) in the cities. There is a medical school in Cotonou producing 25 doctors each year. There is no post-graduate speciality training in ophthalmology.

Over half the population (56%) lives by agriculture and fishing. The main crops are maize, rice, yams, peanuts and beans. Mangoes and papaya are found throughout the country, and, in the south, citrus fruits, coconuts, bananas, plantains and pineapples are abundant. Cotton and palm oil are exported.

The climate in the south is tropical, warm (23–34°C) and very humid (80–95%) with rain (1100 mm per year) during nine months of the year. The north is drier, less humid, with only five months of rainfall. In December and January, a dry cold wind, full of dust (harmattan) blows, especially in the north.

Ophthalmic services are inadequately developed. In 1990 there were five Beninois ophthalmologists, four based in the University Hospital in Cotonou (economic capital), and one in the regional hospital in Porto-Novo (administrative capital). Both these cities are on the coast and 30 km apart. There were no other ophthalmologists (national or expatriate). However, the church hospitals at Bembereke (530 km north of Cotonou) and at Tanguieta (585 km from Cotonou) both had busy eye clinics. There were no other permanent ophthalmic services. Of approximately 250 cataract operations carried out in 1990, 80% were operated on in these two northern hospitals.

The 200 bed regional hospital in Abomey (130 km north of Cotonou), Centre Hospitalier Départemental, was built in the 1980s. A small ophthalmic consulting room was fully equipped but there was no available ophthalmologist. Once or twice a month an ophthalmologist from Cotonou would hold an outpatient session. The author was seconded by Christoffel Blindenmission (CBM) to the Ministry of Health, from 1990–1996, when national ophthalmologists were appointed to take over the clinic.

## Results

### 1. Training

In 1990 there was one ophthalmic nurse in Abomey who was within six months of retirement. Two young state registered



nurses were recruited and began work in 1991. Neither had any prior knowledge of ophthalmology.

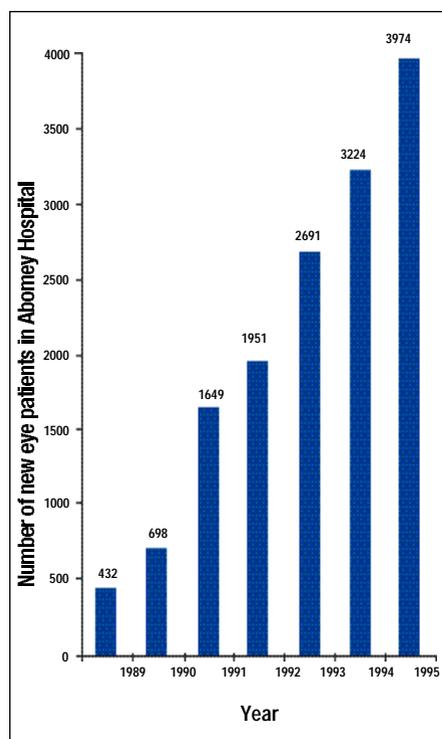
At the 'Institut d'ophtalmologie tropicale en Afrique' (IOTA) in Bamako, Mali, there is a two year diploma course for the training of general nurses to become 'Infirmier spécialiste en ophtalmologie'. The diploma is recognised by the 14 francophone states of west and central Africa. CBM provided scholarships for the two nurses, and also for the third nurse who was recruited to cover the study leave of each of the others. The first year is held at I.O.T.A, the second is a year of supervised work at their hospital of origin. Those who benefit most from this training are nurses who have worked for about a year in an eye clinic before beginning formal training and who are eager to learn.

### 2. Outpatient Work

After a slow start, the number of new patients increased (Table 1) so that by 1995 the team was seeing up to 50 outpatients a day, including 15–18 new patients.

### 3. Eye Surgery

The number of eye surgeries increased from an average of 7 per week in 1991 to 14 per week in 1993 and 21 per week in 1995 (Table 2). Table 3 shows the major types of surgery performed. Cataract surgery (ICCE) predominated, with 52% of all cases in 1995. Operative treatment for chronic open angle glaucoma is the only practical alternative in rural Africa, as supplies of beta-blockers or pilocarpine are expensive when available and patient compliance over a long period is very poor. Our usual anaesthetic was a retrobulbar block, using 2% plain lignocaine. The complication of retrobulbar haemorrhage occurred in less than 1:200. We could have operated on many more cases of pterygium but our policy was to advise surgery only when the visual acuity was reduced by the pterygium.



**Table 1: New Eye Patients in Abomey Hospital, 1989–1995**

The sex distribution in the cases of cataract surgery, showed an equal distribution. The first hundred cases were accumulated over 14 months, whereas four years later it took only three months.

At the beginning there were four male glaucoma patients for every female, but this reduced over time. Table 4 shows the age and sex distribution of the first and last hundred patients having trabeculectomy in Abomey, 1990–1996. The first hundred cases were accumulated over a period of two years and ten months. The last hundred had surgery over a ten month period.

Over the six years, 188 children (under 15 years) underwent eye surgery. Of the 287 operations, 96 (33%) were for cataract and 56 (19.5%) for glaucoma (Table 5). The usual anaesthetic was ketamine, given either by the IM or IV route. There was one anaesthetic death in a girl of four.

Of the 96 cataract operations in children, 42 patients had a bilateral procedure and 60% of the cataract operations were performed in children over the age of five years. Of the 56 trabeculectomies on 22 patients, all but one patient had a bilateral operation. Most eyes (75%) were operated on before the patient was a year old. Five children needed second bilateral procedures and three needed a repeat trabeculectomy in one eye.

#### 4. Outreach work

One day a week was reserved for outreach work. A typical day would involve driving a hundred kilometres to a small town, examining between 70–150 patients and driving home in the afternoon. Clinics

were held in dispensaries, small hospitals, schools or village centres. The car was donated by CBM.

#### Discussion

In March, 1990, a national survey was undertaken by the World Health Organization to measure the prevalence of blindness (visual acuity < 3/60), and visual impairment (<6/18–3/60) and to assess the essential ophthalmic requirements for Benin.<sup>2</sup>

The principle results were:

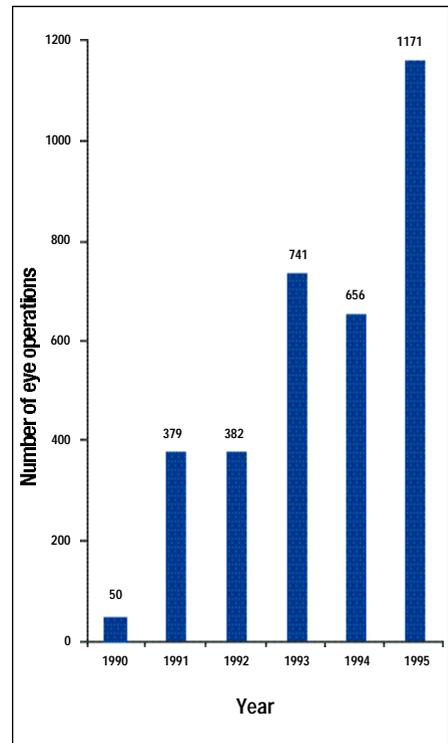
- Prevalence of bilateral blindness 0.63% = 28,000 people
- Prevalence of visual impairment 2.5% = 120,000 people
- Prevalence of unilateral blindness 1.1% = 51,000 people

Cataract was the principle cause of bilateral blindness (54%) and visual impairment (64%). Glaucoma accounted for 15% of bilateral blindness and corneal pathology was responsible in 11%.

Seventy-two thousand cases of cataract needed surgery, of which an estimated 15,000 were already blind and 580,000 people were in need of spectacles. Trachoma was found in the north of Benin and caused 1% of blindness. However, an estimated 4,000 people have trichiasis and are at risk of losing sight.

The report ended with the following conclusions:

1. The need to establish a national committee for the prevention of blindness.



**Table 2: Eye Surgery – Abomey Hospital, 1990–1995**

2. The need for co-ordinated action to reduce blindness from cataract by developing surgical services in regional hospitals and by the training of personnel.
3. The large need for the provision of affordable spectacles by the creation of optical workshops.

The author's priorities upon arrival in Abomey were therefore:

1. To establish an eye care service to all sections of the community by the use of appropriate technology at affordable prices.
2. To emphasise the surgical treatment of cataract, glaucoma and trichiasis.
3. To train nurses in eye care.
4. To develop an outreach service by holding eye clinics in peripheral towns and to perform eye surgery where suitable facilities existed, as close to the patients' homes as possible.

Many African countries have only one ophthalmologist per million population and they usually work in the major cities. Benin in 1990 was therefore typical in this respect, with nearly five million people and five national ophthalmologists in the capital cities. The number of surgeries performed was low because the cost of surgery to the patient was high and because surgical equipment (instruments, sutures, etc) was hard to obtain. By 1996 Benin had a ratio of one ophthalmologist per 400,000 population.

**Table 3: Comparison of All Eye Surgery, 1991, 1993, 1995**

	1991	1993	1995
Cataract	173 (45%)	431 (58%)	618 (52%)
Trabeculectomy	66 (17%)	86 (11.6%)	232 (19.8%)
Pterygium	40 (10%)	32 (4%)	37 (3%)
Evisceration	20	26	39
Enucleation	3	4	7
Exenteration	0	1	1
Entropion repair	3	6	18
Optical iridectomy	3	5	10
Peripheral iridectomy	8	5	6
Lateral tarsorrhaphy	3	4	1
All others	60	141	202
<b>Total</b>	<b>379</b>	<b>741</b>	<b>1171</b>
	No retrobulbar haemorrhage	3 retrobulbar haemorrhage	5 retrobulbar haemorrhages 1 anaesthetic death: child aged 4 I.M. Ketalar

**Table 4: Glaucoma Surgery in Abomey**

	Trabeculectomy			
	patients		First hundred Last hundred patients	
	October 90 – August 93		October 95 – July 96	
Ages	M	F	M	F
<19	12	1	2	4
20–39	10	3	10	2
40–59	32	6	24	10
60–79	26	9	27	19
80–	1	0	2	0
<b>Total</b>	<b>81</b>	<b>19</b>	<b>65</b>	<b>35</b>

It is important when setting a scale of patient fees not to erect a financial barrier to the patient. In Abomey we set the cost of cataract surgery at around half a month's average salary. A pair of spectacles was sold for a sum equivalent to three days work. Our spectacles were imported ready-made from India, and the hospital made a small profit on each pair sold which was used to subsidise other eye care services.

The more eye surgery performed, the cheaper each operation may become.<sup>3</sup> CBM provided surgical equipment, medicines and sutures. However it would have been possible to purchase these items using patients' fees. The capital to purchase the vehicle for outreach work however could not have been raised locally. The revenue from a busy surgical eye department can substantially increase the income of a general hospital and cover the salaries of other members of staff.

Although this new service became busy

**Table 5 : Eye Surgery – Children Under 15 Years**

October 1990 – July 1996	
Cataract	96 (33.4%)
Trabeculectomy	56 (19.5%)
Evisceration	25 (8.7%)
Probe (nasolacrimal duct)	16 (5.5%)
Cut post-cataract membrane	13 (4.5%)
Removal FB	11
Optical iridectomy	11
Enucleation	11
Repair perforation of cornea	10
Excision conjunctival papilloma	9
EUA	8
Incision, drainage abscess	7
Trichiasis	4
Chalazion	2
Orbital lipoma	2
Others	6
<b>TOTAL</b>	<b>287</b>

it failed to achieve the targets set by the 1990 WHO report. No progress was made in integrating national ophthalmologists into the project. The aim of making eye treatment accessible and affordable did not appeal to all medical colleagues. There is genuine suspicion of generic prescribing, standard strength spectacles, 'appropriate' technology and outreach work in unsophisticated settings. Motivation is also a factor

that needs to be faced.

Difficulties that still need to be overcome include the equipping of regional hospitals with surgical and diagnostic materials for eye work, the practical surgical training of ophthalmologists in cataract and glaucoma surgery and the encouraging of such personnel to serve the population from peripheral hospitals, resulting in a more equal distribution of human resources. Salaries for national ophthalmologists are low. Urban private practice thus becomes an attraction and a necessity for ophthalmologists who have families to support.

At present, eye centres are underused by patients. There are several reasons for this. Cost is certainly a major factor. Low incomes and rising inflation mean that eye care is not affordable to the elderly and blind who are often amongst the poorest members of any society. Basic medicines and routine surgery must be realistically priced. Patients who have travelled long distances should be treated promptly or they will return home never to reappear.

Ophthalmology has low priority in most Ministries of Health. In Africa, mother and child health, malaria, AIDS, tuberculosis and vaccination programmes rightly claim political attention. Prevention of blindness may be considered a luxury. To the individual, however, blindness is greatly feared. For it renders the person vulnerable, inactive and a burden on the immediate family.

### Conclusions

There is a need for accessible and affordable eye care in rural Africa and Benin is no exception. Large numbers of patients remain blind from cataract because there are too few surgically trained ophthalmologists. There is a need to encourage and to motivate national ophthalmologists to



*Bilateral cataract in Africa*

Photo: Murray McGavin

work in regional centres. These centres need equipment. At present it is unrealistic to expect Ministries of Health to provide the finance for this. Non-governmental agencies from the developed world should continue to offer help in training suitably motivated doctors and nurses. Such training should be appropriate to the situation where the doctor or nurse will later work. The existing training programme of IOTA in Mali is insufficient to meet all the needs and new training centres are required.

Eye care services, and particularly prevention of blindness activities, are important and can be made cost-effective and sustainable, providing policy makers and planners take into account both the needs of the patients and those of the health care providers.

### Acknowledgements

The contribution of the three Beninois ophthalmic nurses to the work in Abomey was considerable. I thank them, Atiye Blande-Blaise, Alavo Gaston and Kanlihanon Georges.

The work in Abomey was funded by Christoffel Blindenmission, Germany.

### References

- 1 Deuxieme recensement général de la population et de l'habitation. Fevrier 1992. Ministère du Plan. République du Bénin 1994.
- 2 Negrel A-D, Minassian D C, Avognon Z, Babagbeto M. The prevalence and causes of blindness and visual handicap in the Republic of Benin. WHO, Geneva, 1990.
- 3 Yorston D, Foster A. Cataract surgery: utilisation of services and cost recovery. *J Comm Eye Health* 1995; **8**: 6–7.

☆ ☆ ☆