

# Non-physician cataract surgeons in Sub-Saharan Africa: situation analysis

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## Abstract

**OBJECTIVES** Non-physician cataract surgeons (NPCS) provide cataract surgical services in some Sub-Saharan African (SSA) countries. However, their training, placement, legal framework and supervision have not been documented. We sought to do so to inform decision-making regarding future training.

**METHODS** Standard questionnaires were sent to national eye coordinators and other ophthalmologic leaders in Africa to collect information. Face-to-face interviews were conducted at training programmes in Ethiopia, Tanzania and Kenya, and email interviews were conducted with directors at training programmes in the Gambia and Malawi.

**RESULTS** Responses were provided for 31/39 (79%) countries to which questionnaires were sent. These countries represent about 90% of the population of SSA. Overall, 17 countries have one or more NPCS; two-thirds of the total 245 NPCS are found in only three countries. Thirty-six percent of NPCS work alone, but a formal functioning supervision system was reported to be present in only one country. The training centres are similar and face similar challenges.

**CONCLUSIONS** There is considerable variation across SSA in the use and acceptance of NPCS. The placement and support of NPCS after training generally does not follow expectations, and training centres have little role in this. Overall, there was no consensus on whether the cadre, as it is currently viewed, is necessary, desirable or will contribute to addressing cataract surgical needs in SSA.

**keywords** task-shifting, non-physician cataract surgeons, mid-level personnel, human resources, cataract

## Introduction

The shortage of trained manpower in Sub-Saharan Africa (SSA) for providing eye care is long standing and well described (Foster 1991; Sommer & Spivey 2011). Cataract is the leading cause of blindness (Resnikoff *et al.* 2004), and the shortage of personnel to operate on cataract is of special concern. As a result a few ophthalmologists in Africa in the past decades personally trained one or more individual nurses, clinical officers or other non-physician assistants to perform cataract surgery. This informal cadre came to be known as 'cataract surgeons' (Whitfield 1987). In the 1980s, governments and non-governmental organisations (NGOs) in Malawi, Kenya and Tanzania developed structured programmes to train the cadre. The Gambia started training in 2001, and by 2007 Ethiopia had instituted training programmes at four sites in the country. In some other countries, general physicians were trained in cataract surgery. For the purpose of this manuscript, the term 'non-physician cataract surgeons' (NPCS) refers only

to non-physician health workers (medical assistants, clinical officers or nurses) and does not include general medical doctors or surgeons who learn to do cataract surgery and may receive a qualification short of a recognised full specialist award.

So-called task-shifting of specific skills from a higher-trained cadre to a lesser-trained is not unique to ophthalmology. Clinical officers have been trained and have provided the backbone of medical care in many countries in Africa for years; specialised training has been designed for them in a number of areas including anaesthesia, obstetrics, general surgery and orthopaedics (Vaz *et al.* 1999; Dovlo 2005; Luboga *et al.* 2009).

Amongst ophthalmologists, ministries of health and NGOs that are involved in providing eye care, there are different views, often polarised, on the advisability of training and employing NPCS. The strongest arguments in favour have always been (i) that the shortage of ophthalmologists and their concentration in capital cities makes NPCS essential to reducing the prevalence of blindness,

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(ii) that NPCS are more likely to live and work in rural areas than are ophthalmologists and that NPCS are cheaper to train and provide with salaries than ophthalmologists. On the other hand, some argue that surgery on the eye by non-medical specialists is 'second-class' medicine and produces inferior outcomes. Furthermore, NPCS are minimally trained to diagnose and treat other important conditions that lead to blindness and may overstep their competence. Some ophthalmologists see the NPCS as a threat to their own professionalism.

Arguments on both sides are often taken as self-evident or supported by anecdotal evidence, and few data have been systematically gathered. One published report noted that there was no difference in cataract outcomes between ophthalmologists and NPCS; however, the study was not designed specifically to test this, and the authors noted that NPCS operated only on uncomplicated cases (Yorston & Foster 1999). There is one study of factors associated with productivity of NPCS in eastern Africa (Courtright *et al.* 2007). We sought to collect information systematically to inform the discussion on NPCS in Africa. The scope of the current project was (i) to determine the status of NPCS in countries across sub-Saharan Africa and (ii) to describe the training of this cadre.

## Methods

A questionnaire was designed for the Ministry of Health National Eye Coordinators (NECs) by the four investigators; it was designed to collect basic information on whether NPCS work in the country, their numbers, under what conditions they work, how they are supervised, and whether the NEC believes there is a need for training more (or any) of the cadre. The questionnaire was sent to NECs of 39 SSA countries. Information was not collected from Comoros, Equatorial Guinea, Sao Tome and Principe or the Seychelles because they have very small populations (under 1 million). Information was also not collected from Djibouti, Mauritania, Sudan and Somalia because they are considered part of the Eastern Mediterranean region. A slightly different questionnaire was designed for heads of ophthalmologic societies. Several follow-up attempts, by email, phone or personal intervention were attempted for non-responders.

The 8 NPCS training centres were listed, and information on training was collected by structured interviews (digitally recorded) held on visits to three training centres in eastern Africa: Kilimanjaro Christian Medical Centre (KCMC) Hospital in Moshi Tanzania, Kenya Medical Training College (KMTC) in Nairobi, and Gondar University in Ethiopia. The first two centres are responsible for training the majority of NPCS working in eastern

Africa. The 4 Ethiopian centres were all established under a national policy adopted in 2007 by the MoH and are very similar, so only Gondar was visited. Information on the training programmes in The Gambia and Malawi was collected by email correspondence. At the three training sites included in the interviews, trainees present on the day of the visit were asked to complete a questionnaire and interviewed as well.

## Results

Amongst the 39 NECs sent questionnaires, responses were received from 28; in three additional countries, the NEC did not complete the form, but another senior ophthalmologist provided the information. Thus, we had 31 responses, an overall response rate of 79%. Some countries do not allow non-physicians to operate but do allow general medical doctors with some training to operate and they refer to this cadre as 'cataract surgeons'. Table 1 summarises the countries where NPCS, 'physician cataract surgeons' and ophthalmologists are in practice. Amongst the 14 countries without NPCS, 3 countries train non-physicians to carry out other types of surgery (e.g. obstetrics), but the other 11 do not allow non-physicians to do any type of surgery. Amongst the 17 countries with NPCS, 9 (53%) of these have fewer than five working. Amongst the total 246 cataract surgeons reported throughout Africa, 67% of them are in the three countries of Tanzania, Kenya and Ethiopia.

Amongst the 14 countries without NPCS, four of the NECs reported that they feel that there is a need to adopt this cadre to deal with the backlog of cataract and three of these four believe that ophthalmologists would accept the cadre. In the 10 countries where the NEC felt there was no need to have NPCS, nine believed that ophthalmologists would oppose the cadre. There were few responses from heads of national ophthalmologic societies; some were in agreement with their respective NECs and some were not.

Regarding the working environments of the NPCSs, overall, 89 NPCS (35%) provide services at a hospital where there is no ophthalmologist. Two countries account for 71% of solo NPCS. There are only six countries in which the cadre is officially recognised by the government, and of these only two provide a salary increase upon completion of the cataract surgeon training programme. Two of the six countries have a regulatory body for NPCS, but the other four do not. Only one country reported having a system in place for regular supervision of the NPCS by an ophthalmologist. The NECs from all countries with NPCS at present (whether few or many cataract surgeons) reported that they believe there is a need to train more NPCS.

S. Lewallen *et al.* **Non-physician cataract surgeons****Table 1** Status of Non-physician cataract surgeons (NPCS) in 39 Sub-Saharan African (SSA) countries

	No. of countries and names	Population (millions)
Non-physician cataract surgeons working	17 (Cameroon, Eritrea, Ethiopia, 'Gambia, Ghana, Guinea, Kenya, Malawi, Senegal, Sierra Leone, Zambia, Niger, Tanzania, Uganda, Benin, Burkina Faso, Mali)	375
Physician cataract surgeons working.	3 (South Africa, DR Congo, Madagascar)	140
No non-physician cataract surgeons		
Ophthalmologists only	11 (Togo, Rwanda, Botswana, Burundi, Cote d'Ivoire, Mauritius, Mozambique, Namibia, Nigeria, Swaziland, Zimbabwe)	252
Information not available	8 (Angola, Congo Republic, Gabon, Guinea Bissau, Lesotho, Liberia, Central Africa Republic, Chad)	49

The training programmes share many similarities. All focus at a minimum on training in ECCE/PC-IOL, use of slit lamp, applanation tonometry and direct ophthalmoscopy. Selected trainees may receive instruction in small incision cataract surgery (routine for all in the Gambia), and some learn indirect ophthalmoscopy. All centres send trainees on outreach to operate in rural settings; supervision during these experiences varies. All centres report that trainees are expected to do 100 cataracts under supervision. Refraction training includes basic refraction with spheres and correction of presbyopia. Trainees are expected to diagnose and refer glaucoma, diabetic retinopathy and other operable conditions, although skills are often limited in these areas.

Two significant and clear themes arose from interviews with the training directors. The first is placement of the NPCS after training. Whilst all centres expressed a preference for taking trainees from rural areas who would return to those after training, there is no ability to ensure this happens. It was noted that some trainees do not want to return to rural areas and some have settled in urban areas, even setting up private practices. Some trainees were willing to pay for their own training specifically to get a chance to get out of the rural areas from which they came.

The second theme, expressed by trainers and trainees, was the lack of support and utilisation of NPCS after training. Some trainees have never performed any cataract surgery after graduation because they had no equipment or lacked other support, and some have waited 1–2 years for equipment and then felt they needed re-training, and some have left the field of eye care entirely.

Twelve of 16 trainees (all within weeks of completing training) at the three eastern Africa centres were interviewed; they ranged from 29 to 45 years in age with a mean of 37 years. The actual numbers of cataract surgeries performed during training amongst 8 trainees averaged about 75 (range, 35–110, four unknown). Seven of the 12

recent graduates expressed their desire to work in a hospital under an ophthalmologist, whilst five reported that they desired to work in a hospital without an ophthalmologist. Most trainees expressed the concern that they would not have equipment or consumables in their new posts. Of the 12 interviewed, six reported that there is no equipment where they will be posted, four did not know about equipment, and two were confident they would have equipment.

## Discussion

There is considerable variation across SSA in the use and acceptance of NPCS, and in their training, placement, support and supervision. Whilst NPCS are part of the human resources mix in 17 countries, they are only a sizeable proportion of the workforce in five countries (Kenya, Tanzania, Ethiopia, the Gambia and Eritrea) and most countries have only a few NPCS. Roughly half the population of SSA lives in countries where NPCS are not accepted.

Few countries without NPCS felt that there was a need to have this cadre. Yet, all of the NECs in countries with NPCS said that they needed more. This difference of opinion may be the result of a number of factors: political pressure, a misunderstanding of the true cataract surgical needs or a misunderstanding of the human resource potential of existing cataract surgical service providers. One sentiment that was raised frequently by ophthalmologists can be paraphrased thus: 'why consider training more cataract surgeons when we don't equip and support existing ophthalmologists that need assistance?'

This survey indicates that 64% of NPCS work in settings where there is an ophthalmologist present, which is interesting in view of the argument for training NPCS to supply services to areas where there are no ophthalmologists. Three quarters of these solo NPCS work in just two countries. Working in a hospital with an ophthalmologist

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does provide better supervision for the NPCS; this is an important consideration because only one of the five countries with large numbers of NPCS working on their own has a formal functioning system for supervising this cadre.

Training centre directors expressed concerns about the willingness of NPCS to work in rural areas after training, suggesting that the expectations of policy makers, training programmes, funders of training and the trainees are not always convergent.

In summary, the current regulatory environment, lack of supervision and support following training and lack of universal acceptance all indicate that simply training more NPCS is unlikely to contribute significantly towards solving the problem of cataract in SSA. This is not to say that NPCS cannot or should not be part of the human resource workforce in Africa. In sites where they can be supervised adequately by ophthalmologists, they may add considerably to the provision of high-quality cataract surgery. Additional documentation, however, focused on the most efficient way to select, train, deploy and ensure that this cadre is productive and able to offer safe and successful cataract surgery would be helpful before we advocate for scaling up training. We must insist on documentation of the productivity and above all the quality of services provided to patients by any cadre for which we support training.

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