

Non-physician cataract surgeons in Sub Saharan Africa: Situation Analysis

Report for the International Council of Ophthalmology

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Executive Summary

This situation analysis is intended to provide basic facts about the cadre of non physician cataract surgeons in sub-Saharan Africa (SSA). Questionnaires were sent to the national eye coordinators of 37 countries and responses received from 28 (75%) representing about 90% of the population of SSA. Fifty two percent of people live in countries that do not currently allow cataract surgeons and 37% in countries that do allow this cadre.

About two-thirds of existing cataract surgeons work directly under an ophthalmologist and one-third work alone. For the latter group, a formal supervision system was reported to be present in only one country.

Interviews at 3 eastern African training centers revealed relatively standard training goals (ECCE/PC-IOL). General concerns were whether cataract surgeons are being placed to cover rural areas without ophthalmologists, and about lack of support after training (equipment, other infrastructure or community programs). The latter was blamed for high attrition rates (probably 30-50%) after training. An interview with the only large training centre in West Africa was outside the scope of this project; it appears, however, that trainees from that centre may be better supported and suffer less attrition. The issue of post training support was considered in this program from the beginning.

This report raises questions about whether *existing* practices regarding the training, deployment, and support of cataract surgeons are appropriate if this cadre is expected to contribute effectively to the human resources needed for dealing with visual impairment from cataract in SSA. Furthermore, there is no consensus on whether the cadre, as it is currently viewed, is necessary or desirable; and each country must examine the issues in light of its own needs.

Background

The shortage of trained manpower in Africa for providing eye care is long standing and well described. Since cataract is the leading cause of blindness, the shortage of ophthalmologists who can operate on these has been of special concern. As a result some ophthalmologists in Africa in the past few 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.” In the 1980s governments and non governmental organizations (NGOs) in Malawi, Kenya and Tanzania developed structured programs to train the cadre.¹ The largest of these were in the latter two countries. In 2007, Ethiopia instituted training programmes at four sites in the country. In this report the term “cataract surgeons” will refer only to non physician paramedical workers (medical assistants, clinical officers, or nurses) who are trained specifically to do cataract surgery. We will not include the cadre of general medical doctors or surgeons who learn to do cataract surgery, and may receive a qualification short of a recognized 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 provided the backbone of medical care in many countries in Africa for years; specialized training has been designed for them in a number of areas including anesthesia, obstetrics, general surgery, orthopedics, and others.

Amongst ophthalmologists, ministries of health, and NGOs that are involved in providing eye care, there are different views, often polarized, on the advisability of training and employing “cataract surgeons.” The strongest arguments in favor have always been (1) that the shortage of ophthalmologists makes cataract surgeons essential to reducing the prevalence of blindness and (2) that cataract surgeons are more likely to live and work in rural areas than are ophthalmologists.

On the other hand, some argue that surgery on the eye by non medical specialist is “second class” medicine and produces inferior outcomes. Furthermore, cataract surgeons are minimally trained to diagnose and treat other important conditions that lead to blindness and are likely to overstep their competence. Some ophthalmologists see the cataract surgeons as a threat to their own professionalism.

Arguments on both sides are often taken as self evident and supported by anecdotal evidence but few systematically gathered data. There is one study of factors associated with productivity of cataract surgeons in eastern Africa² (abstract provided as Appendix A). There are no reports comparing surgical outcomes of cataract surgeons to those of ophthalmologists. We sought to collect information systematically to inform the discussion on cataract surgeons in Africa. The scope of the current project was (1) to determine the status of non physician cataract surgeons in countries across Africa and (2) to describe the training of this cadre.

Methods

A questionnaire was designed for the National Eye Coordinators (NECs) with input from the 4 investigators; it given as appendix B. The purpose was to collect basic information on whether cataract surgeons work in the country, under what conditions, 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 37 sub-Saharan African countries. Seven (Comoros, Equatorial Guinea, S Tome & Principe, Seychelles, Djibouti, Mauritania, Sudan and Somalia) were not polled as the former 4 are very small and the latter 4 are considered part of EMRO. 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.

Information on training was collected by visits to 3 the training centres in eastern Africa and interviews with the heads of the centres (digitally recorded) using a semi structured questionnaire. (Appendix C) Trainees present on the day of the visit were asked to

complete a questionnaire and interviewed as well. Two key informants were polled about other training programmes on the continent.

Findings

Status of cataract surgeons in different countries

Among the 37 NECs sent questionnaires, responses were received from 26; in two additional countries the NEC did not complete the form but another senior ophthalmologist provided the information. Thus, we had 28 responses, an overall response rate of 76%. We took care to collect information on non physician cataract surgeons only. 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.” The map (Figure 1) shows countries where non physician cataract surgeons, “physician cataract surgeons” and ophthalmologists are in practice. The information is summarized in Table 1.

Table 1 Status of non ophthalmologist “cataract surgeons” in sub Saharan African countries*

	# of countries	Population (millions)
Non-physician cataract surgeons working	14	251
Physician cataract surgeons working. No non-physician	3	130
Ophthalmologists only	11	229
No response	9	73

* Includes responses from Botswana, Burundi, Cameroon, DRC, Cote d’Ivoire, Eritrea, Ethiopia, Gambia, Ghana, Guinea, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Swaziland, Tanzania, Uganda, Zambia, and Zimbabwe. Comoros, Djibouti, Equatorial Guinea, Mauritania, S Tome & Principe, Seychelles, Sudan and Somalia were not polled as they are either very small, have no NEC, or are part of EMRO

While 14 countries report having non-physician cataract surgeons, 7 of these only have one to three working. Among the total 256 cataract surgeons reported throughout Africa 73% of them are in the three countries of Tanzania, Kenya and Ethiopia. Excluding data from Tanzania and Uganda (information not complete), only 51/192 cataract surgeons (27%) provide services at a hospital where there is no ophthalmologist. There are only 6 countries in which the cadre is officially recognized by the government and of these only 2 provide a salary increase upon completion of the cataract surgeon training programme. Only one country reported having a system in place for supervision of the cataract surgeons by an ophthalmologist. Two of the 6 countries have a regulatory body for cataract surgeons but the other 4 do not. The NECs from all countries with cataract surgeons at present (whether just a few or many cataract surgeons) reported that they believe there is a need to train more non-physician cataract surgeons.

Among the 14 countries without non-physician cataract surgeons, 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. Among the 14 countries, 4 of the NECs reported that they feel that there is a need to adopt this cadre to deal with the backlog of cataract and 3 of these 4 believe that ophthalmologists would accept the cadre. In the 10 countries where the NEC felt there was no need to have cataract surgeons, 9 believed that ophthalmologists would oppose the cadre. (Table 2)

Table 2: Reports from countries without non-physician cataract surgeons

	# of countries	Population (millions)
NEC feels there is a need for non-physician cataract surgeons	4	22
NEC feels there is no need for non-physician cataract surgeons	10	334
Ophthalmologists likely in favor of having non-physician cataract surgeons	4	21
Ophthalmologists likely not to be in favor of having non-physician cataract surgeons	10	335

There were few responses from heads of ophthalmologic societies; some were in agreement with NEC and some were not. One sentiment that was frequently raised by ophthalmologists completing the questionnaire can be paraphrased thus: why are we considering training and equipping more cataract surgeons when we are failing to equip and support existing ophthalmologists that need this assistance?

Training programmes

Structured interviews were held at 3 training centres: 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 cataract surgeons working in eastern Africa. Among Ethiopia's 4 training centers only the one at Gondar University was interviewed. The 4 Ethiopian centres were all established under a national policy adopted in 2007 by the MoH and so are very similar. Information on the training programmes in The Gambia and Malawi was collected by email.

Eastern African (Kenya, Tanzania, Ethiopia) training programmes

There are many similarities among these programmes, particularly in what they expect trainees to learn to do. All centers focus 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 (SICS) and indirect ophthalmoscopy. (A few years ago the cataract surgeons in the Gambia were retrained in SICS and presumably the current training offered there is in SICS too). Trainees are expected to diagnose and refer glaucoma, diabetic retinopathy, and other operable retinal conditions. Refraction training includes basic refraction with spheres and correction of presbyopia.

All programs prefer to take trainees under 40 years of age and give preference to those with previous experience in eye work (experience as an eye nurse is required in Ethiopia).

All centers send trainees on outreach where they experience operating in rural settings. Supervision during these experiences varies. In Kenya and Tanzania, competition with ophthalmology residents for patients has resulted in increased time at outlying hospitals for cataract surgeon trainees; in Kenya almost all surgery is done outside the main training centre. All centers report that trainees are expected to do 100 cataracts under supervision. All trainees are expected to keep logbooks of surgery to be reviewed by the trainer. Some of the differences among the centres are shown in Table 3.

Table 3. Differences among non physician “cataract surgeon” training centres

	Ethiopia (Gondar)	Kenya (KMTC)*	Tanzania (KCMC)**
When program started	2007	1984. Curriculum revised in 1995	1976
# graduates since starting	8	80-90 as surgeons	Approx 75 as surgeons
# per year	2-3	8-10	2-3 until increase in 2008 to 4-5
Number applicants/places available	3-4 times number of places	about 2 times number of places	2-3 times number of places
Length of training	2 years	18 months	2 years
Countries where students come from	Ethiopia. (Would like to attract foreigners but none so far.)	90% Kenyan	Mostly Tanzania but also Malawi, Zambia, Kenya, Ethiopia, Eritrea
Fee for training	Government pays for most. Private pay would be 30,000 Birr. (US\$2700)	KSh equivalent of US\$1500 for 2 year course.	US\$ 3,500 for foreigners. Government sponsors students for 800,000 Tsh (US\$600) for 2 years.

			NGOs pay 1,600,000 (US\$1230) for 2 years.
Who pays fees?	Most are government sponsored	Many pay for themselves. Some sponsored by NGOs	Mix of sponsorship by NGO and government.
Educational prerequisite	Ophthalmic nurse (diploma) with recommendation from ophthalmologist	Clinical officer (“O level” plus 2-3 years in health school) followed by a few years clinical experience (need not be ophthalmic)	** “Assistant medical officer” (clinical officer plus another 2 years in health school) followed by a few years clinical experience (need not be ophthalmic)
Grade or salary changes after graduation	Awarded a BSc in cataract surgery. Salary increases by 1000 birr (doubling). BSc award requires that some general education courses (e.g., sociology, psychology) be completed.	Higher diploma awarded but no change in salary grade	Advanced diploma awarded but no change in salary grade.

* This program is undergoing restructuring with support from SSI. The plan is to offer a 1 year course for ophthalmic clinical officers without surgery, a 2 year course to include cataract surgery and another 2 year course for ophthalmic clinical officer/refractionist/low vision .

** The MoH has recently decided to eliminate the cadre of “assistant medical officer” (AMO) from which cataract surgeon trainees have been drawn. The plan is to start

training “clinical officers” (a lower level than AMO in Tanzania) as cataract surgeons instead. This will allow younger trainees.

When discussion turned to challenges the programs faced, two significant and clear themes arose. The first is placement of the cataract surgeons after training. All centres expressed a preference for taking trainees from rural areas who would return to those after training. However, 2 centres noted that this has been a problem. Some trainees do not want to return to rural areas and some have settled in more urban areas, even setting up private practices. One trainer suggested that trainees were willing to pay for their own training specifically in order to get a chance to get out of the rural areas they came from. Another trainer stated that he wasn’t certain that training this cadre would solve the problem of cataract blindness.

The second theme, expressed by all three eastern centres was the lack of support and utilization of cataract surgeons after training. Some trainees have never done any cataract surgery after graduation because they had no equipment or lacked other support, 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. Frustration among trainers was especially great because many of the trainees’ fees were supported by MoH that did not provide any support after training. (Note that all the training centers actually receive most of their financial support from NGOs and the trainees’ fees cover only a small part of the actual costs of training.) Although it was beyond the scope of this report to follow up trainees, it appears that 40 or 50% of them experience lack of support after training and attrition is high.

Fourteen of 18 soon-to-graduate trainees (within weeks of completing training) were interviewed; they ranged from 29-45 years in age with a mean of 37. (Tanzanians are older, average 40 years, because of the requirement that they have a qualification beyond the “clinical officer” grade) The actual numbers of cataract surgeries done during training among 8 trainees who had just finished training averaged about 75 (range 35-110, 4 unknown).

Seven of the 12 recent graduates expressed their desire to work in a hospital under an ophthalmologist while 5 reported that they desired to work in a hospital without an ophthalmologist. Consistent with comments from the heads of the centres, most trainees expressed the fear that they would not have equipment or consumables in their new posts. Of the 14 interviewed, 6 reported that there is no equipment where they will be posted, 6 didn't know about equipment and 2 are confident they will have equipment. Among the Tanzanians graduating, 2 expected that their salaries would increase upon graduation even though government policy does not support this expectation.

Of note, directors of cataract surgeon training programs as well as other interested parties from several countries in Africa met in Moshi Tanzania to discuss issues of training in 2007. The report from that meeting (<http://www.kcco.net/Cataractsurgeontrainingdirectorsmeetingsummary.pdf>) emphasized the need for post training support. It has been a long term problem.

Other training programs

The cataract surgery training programme in The Gambia started in 2001 and is run by the Regional Ophthalmic Training Programme (ROTP), the training arm of the Sheikh Zayed Regional Eye Care Centre (SZRECC). Candidates are ophthalmic nurses and on graduation they are called Senior Ophthalmic Medical Assistants (SOMAs). Since inception, the programme has trained 58 candidates including 16 each from The Gambia and Senegal, 8 from Guinea Bissau, 5 from Liberia, 3 from Sierra Leone, 2 each from Guinea, Benin and Tanzania, and 1 each from Burkina Faso, Chad, Togo, and Zambia. The duration of the programme is 9 months and consists of 2 months theory and 6-7 months practical experience. The key informant who provided information reported that the majority of trainees from the Gambia programme are practicing now in their respective countries. This information is in agreement, for the most part, with the reports from NECs.

Training of cataract surgeons has been on going in Malawi for over 20 years. In the past 10 years there have been around 15 trained, 3 of whom have been trained for Malawi and the rest from outside the country.

Summary

There is considerable variation across sub-Saharan Africa in the use and acceptance of non physician cataract surgeons, in their training, placement, support and supervision. Key points arising from this survey include the following:

Acceptance of cataract surgeons across sub-Saharan Africa

While cataract surgeons currently work in 14 countries, only in 6 or 7 are there significant numbers (more than 3). Around 37% of people in sub-Saharan Africa live in a country where non physician cataract surgeons are currently allowed to practice, 52% in countries where they are not allowed and 11% are unknown. According to responses from NECs and heads of ophthalmologic societies, ophthalmologists are divided in their acceptance of the cadre. The regulatory environment for non physician cataract surgeons is absent in most countries, including some that currently have cataract surgeons. In most countries the training does not lead to an upgrade or salary increase.

Is there a perceived need to train more cataract surgeons?

Few countries without cataract surgeons felt that there was a need to have cataract surgeons. At the same time, all of the NECs in countries with cataract surgeons said that they needed more. This disconnect may be the result of political pressure or a misunderstanding of the true cataract surgical needs and human resource potential. Nevertheless, the failure to support ophthalmologists working in rural areas was noted by many as being more important than training more cataract surgeons.

Training of cataract surgeons

The bulk of cataract surgeons have been trained in structured programs in Kenya and Tanzania over the past few decades. In the past decade, however, The Gambia has trained a significant number and Ethiopia is poised to train many with their 3 recently established training centres. Standards and curricula are similar although actual supervision and numbers of cataracts operated during training varies. Programs are expected to select the “best” or “most appropriate” candidates but have no role in posting, equipping, or supervising after training. Lack of support in terms of critical equipment and other infrastructure support is a serious problem in all three eastern Africa training centers, with resulting high attrition.

Cataract surgeon placement and support after training

One argument for training non physician cataract surgeons is to supply services to areas where there are no ophthalmologists. At present, however, only 27% of cataract surgeons work in a hospital without an ophthalmologist. In the six countries with large numbers of cataract surgeons working on their own only one has a formal functioning system for supervising this cadre. Two of three training centres interviewed expressed strong concerns about the willingness of non physician cataract surgeons to work in rural areas.

It is interesting that the small amount of information we had from the training in The Gambia contrasts with what we learned in eastern Africa. It would be worthwhile to follow up on this in order to understand the reasons for a (putatively) more positive situation there.

References

1. Whitfield R. Dealing with cataract blindness. Part III: Paramedical cataract surgery in Africa. *Ophthalmic Surgery*. 1987;18:765-767
2. Courtright P, Ndegwa L, Msosa J, Banzi J. Use of our existing eye care human resources: assessment of the productivity of cataract surgeons trained in eastern Africa. *Arch Ophthalmol*. May 2007;125(5):684-687.

Appendix A

Use of our existing eye care human resources: assessment of the productivity of cataract surgeons trained in eastern Africa.

[Courtright P](#), [Ndegwa L](#), [Msosa J](#), [Banzi J](#). [Arch Ophthalmol](#). 2007 May;125:684-7.

Abstract

OBJECTIVES: To measure the productivity of cataract surgeons in Africa and assess the factors that predict high productivity. **METHODS:** A questionnaire on productivity and working environments was sent to all cataract surgeons trained in Malawi, Uganda, Tanzania, and Kenya. In addition, 2 meetings and in-depth discussions were held to elicit information on strategies to improve productivity among surgeons in general. **RESULTS:** More than 77 000 cataract surgeries were performed in the years 2000 through 2004, resulting in an annual productivity rate of 243 surgeries per surgeon. Higher productivity was associated with having 2 or more cataract surgical sets, a well-functioning operating microscope, 3 or more nursing support staff, and a community program that includes transporting patients to the hospital. **CONCLUSION:** Strategies for training, supporting, and supervising cataract surgeons in Africa need to be revised to create conditions amenable to greater productivity.

Appendix B

Questionnaire for National Prevention of Blindness Coordinators on non physician cataract surgeons

International Council of Ophthalmology is interested in exploring the evolving role (current and potential) of non-physician cataract surgeons in Africa. The Kilimanjaro Centre for Community Ophthalmology and IAPB Africa are working in collaboration to gather some information. This questionnaire is to help us learn your perspectives on non-physician cataract surgeons in your country. We request that you complete the form and email back to slewallen@kcco.net and to etyaaled@gmail.com. The questionnaire is being sent to national prevention of blindness coordinators in Africa and other key personnel and the findings will be compiled without any identifier (that is, there will be no reference to any specific country or person). We do ask, however, that you include your phone number in the space below; this is so we can make a phone follow up regarding a few specific questions that may arise after compiling the data. A report of the findings will be sent to you after compilation. Your assistance is greatly appreciated.

Contact information	
	Country
	Name of National Prevention of Blindness Coordinator (or person who completed the form)
	Phone number

Current situation of non-physician cataract surgeon in your country	
1	At the present time, does the government allow non-physicians to perform surgical procedures in your country? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No explicit laws about this
2	Are there non-physicians being trained to provide other types of surgery (e.g., for obstetrics) <input type="checkbox"/> Yes <input type="checkbox"/> No
3	Are there non-physician cataract surgeons working in your country? (if answer is "No" go to question #14 below) <input type="checkbox"/> Yes <input type="checkbox"/> No
4	If yes, how many? (total currently working)
4.5	If yes, how many of the total work in a hospital without an ophthalmologist?
5	Is the position of non-physician cataract surgeon (by any name) recognized as a position within the government (MOH)? <input type="checkbox"/> Yes <input type="checkbox"/> No
6	Do non-physician cataract surgeons receive a salary increase upon completion of training? <input type="checkbox"/> Yes <input type="checkbox"/> No
7	Is there a system in place to supervise the work of non physician cataract surgeons regularly? <input type="checkbox"/> Yes <input type="checkbox"/> No
8	If yes, who provides the supervision? <input type="checkbox"/> Medical director of

		hospital <input type="checkbox"/> Ophthalmologist
9	Is supervision by an ophthalmologist expected to be at the hospital (the cataract surgeon works at the same hospital as the ophthalmologist) or through occasional visits? (not at the same hospital)	<input type="checkbox"/> Supervisor is at same hospital <input type="checkbox"/> Supervisor is at a different hospital
10	Is there a regulatory body for the practice of non-physician cataract surgeons? (that is: is there a body that is responsible for setting standards of care, monitoring their work, and providing disciplinary action, if needed?)	<input type="checkbox"/> Yes <input type="checkbox"/> No
11	Is there a need to train more non-physician cataract surgeons for your country?	<input type="checkbox"/> Yes (a need) <input type="checkbox"/> No (no need)
12	If yes, why?	
13	If no, why not?	
For countries with NO non-physician cataract surgeons		
14	Is there a need to include non-physician cataract surgeons as one of the cadre providing eye care services in your country?	<input type="checkbox"/> Yes (a need) <input type="checkbox"/> No (no need)
15	If yes, why?	
16	If no, why not?	
17	If your country does NOT use non-physician cataract surgeons now, do you think ophthalmologists are generally favorable or unfavorable towards instituting this cadre?	<input type="checkbox"/> Ophthalmologists in favor <input type="checkbox"/> Ophthalmologists not in favor
18.	Do you think ophthalmologists are generally favorable or unfavorable to the existence of cataract surgeons?	

Please feel free to add any other comments below and to expand any answers
Thank you for your assistance.