

Global collaboration bears fruit: Tanzania report

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Background

Kidney diseases and other non-communicable diseases are assuming a greater contribution to morbidity and mortality in sub-Saharan Africa.^{1,2} Although Africa is estimated to host a three to four times higher burden of chronic kidney disease as compared with developed countries, treatment facilities are scarce, and shortage of human resources is a major impediment.^{3,4}

Increasing the number of trained health-care providers plays an important role in the management of kidney diseases. The International Society of Nephrology (ISN) has supported the training of more than 600 nephrologists⁵ and has also supported the treatment of patients with kidney diseases in sub-Saharan Africa, particularly in acute peritoneal dialysis.⁴ This has significantly improved nephrology services in the region.

In this article we describe North–South collaboration in supporting nephrology training in Tanzania, involving Muhimbili University of Health and Allied Sciences (MUHAS), Tanzania; Christian Medical College (CMC), Vellore, India; and the University of Bergen/Haukeland University Hospital (UoB/HUH), Norway.

Description of the training collaboration

This collaboration was supported by the Norwegian government through the Norwegian Agency for Development Cooperation's (Norad's) Programme for Master Studies;⁶ a memorandum of understanding between the three training institutions was signed in 2006. The program was aimed at building nephrology training capacity at MUHAS.

A 2-year sandwich postgraduate nephrology training program was established at MUHAS with four semesters; two semesters were trained at CMC and UoB/HUH, and the remaining were trained at MUHAS in collaboration with Muhimbili National Hospital (MNH) as teaching hospital. The funding for the program was provided for 7 consecutive years (2007–2014), after which the entire training will be

at MUHAS with support from the ministry of health and social welfare as for other postgraduate medical training programs.

This provided exposure and skills for candidates with a sound mixture of nephrology practice in a highly developed setting (Norway) and a resource-limited setting (India and Tanzania). The training was comprehensive with complementary learning objectives and coverage of essential aspects of nephrology shared across the centers.

Clinical exposure provided to the candidates included hands on training for in-patient and out-patient management, emergency care, and insertion of acute and chronic peritoneal catheters. Candidates acquired various skills such as performance of renal biopsies, nephropathology interpretation, insertion of temporary hemodialysis access, and percutaneous insertion of both acute and chronic peritoneal dialysis catheters. As part of training, candidates were exposed to kidney transplantation practices, at CMC and at Oslo University Hospital in Norway. These skills were acquired in all three centers, but mostly in India and Norway.

In addition, all candidates were exposed to pediatric nephrology through a 1-month rotation in the Department of Paediatric Nephrology at the Institute of Child Health, Chennai, India. The program included both course work and dissertation and resulted in the award of a master of science degree in nephrology from MUHAS.

Outcome of the collaboration

Establishment of nephrology training in Tanzania. Seven candidates (one female) were trained in nephrology throughout this program, five from Tanzania and one each from Uganda and Ethiopia. The program recruited candidates with a general medicine or pediatrics background, and three of those trained were pediatricians. One candidate dropped from the program. The two candidates from Uganda and Ethiopia returned to their home institutions.

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Two of the Tanzanian candidates are working with MUHAS, and three are working with MNH. The nephrology program is now fully established at MUHAS, where candidates train locally for four semesters, and all Tanzanian-trained candidates are involved in teaching. To reinforce research capacity, one of the program graduates is currently pursuing PhD training at the University of Bergen.

Improved nephrology services. Following this program there has been significant improvement in nephrology services in Tanzania (Table 1). Nephrology services have been reorganized at MNH, and new services have been introduced, including pediatric nephrology, acute peritoneal dialysis, and nephropathology.⁷ Several hemodialysis centers have been established, both public and private, most of which are based in Dar es Salaam (Figure 1), and the number of patients on maintenance hemodialysis has significantly increased.

Advocacy for nephrology. The Nephrology Society of Tanzania (NESOT) was established in August 2012 and became an ISN affiliated member in May 2013. NESOT is a front-runner for advocacy for kidney diseases in Tanzania. During the World Kidney Day 2013 commemoration, NESOT successfully coordinated an awareness campaign and screening of 4000 people for CKD risk factors, which included obesity, hypertension, diabetes mellitus and proteinuria.

Ongoing support for improving nephrology services. The trained nephrologists continue to be mentored and advised by their trainers from both India and Norway, not only in managing difficult cases, but also through joint workshops and scientific meetings and publications.⁸ This ongoing support is very important for providing insight in the potential progress that could be made in advancing nephrology services.

Table 1 | Nephrology services in Tanzania

Variables	Before 2007	2007–2015
Number of nephrologists*	(1)	(10)
Muhimbili National Hospital (Dar es Salaam)	1	5
Kilimanjaro Christian Medical Centre (Kilimanjaro)	0	1
Bugando Medical Centre (Mwanza)	0	1
Mbeya Referral Hospital (Mbeya)	0	1
Regency Medical Centre (Dar es Salaam)	0	1
Total number of dialysis units	(1)	(12)
Dar es Salaam	1	9
Mbeya	0	1
Mwanza	0	1
Dodoma	0	1
Number of hospitals with acute PD programs	(0)	(4)
Muhimbili National Hospital (Dar es Salaam) ^a		
Kilimanjaro Christian Medical Centre (Kilimanjaro)		
Bugando Medical Centre (Mwanza)		
St. Francis Designated District Hospital (Morogoro) ^a		
Renal replacement and nephropathology		
Number of maintenance hemodialysis patients	32	267
Number of transplant patients	26	135
Number of kidney biopsies ^b	0	19
Population of Tanzania is 45 million people ^c		

PD, peritoneal dialysis.

^aUsing improvised PD catheter and/or fluids.

^bBiopsy performed at Muhimbili National Hospital (2012–2015).

^cNational census report, 2012.

* One nephrologist is not doing clinical practice.

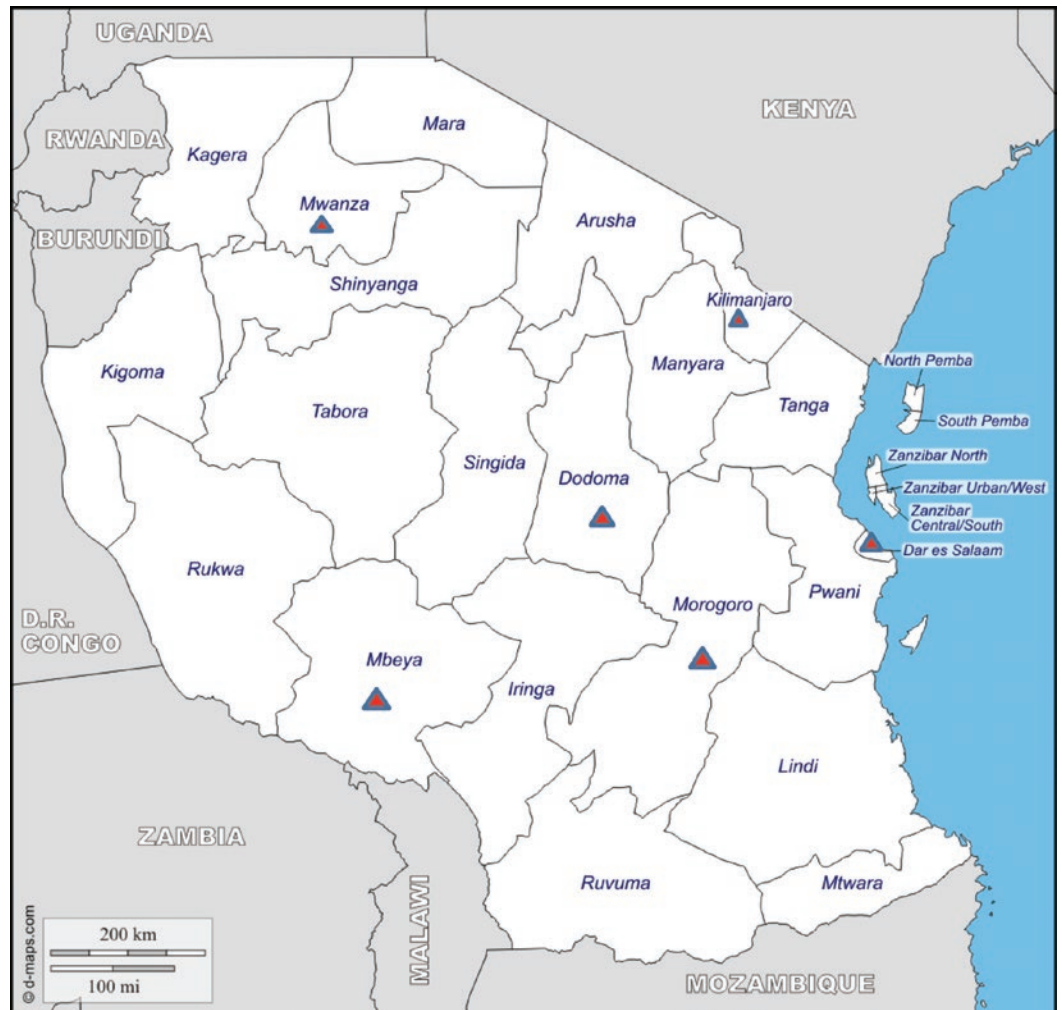


Figure 1 | Map of Tanzania showing regions with facilities offering nephrology services.

Discussion

Tanzania is faced with limited facilities for treatment of patients with kidney diseases, as is the case in other sub-Saharan African countries. Up until 2007 there was only one nephrologist in Tanzania, who was trained through an ISN fellowship program. The collaboration of the three institutions under support by Norad's Programme for Master Studies has trained a total of seven nephrologists, five from Tanzania and one each from Uganda and Ethiopia, enabling them to acquire clinical skills in advanced centers while concurrently training in the local context in Tanzania.

Clinical exposure provided in this program matches the ISN fellowship program.⁹ The number of doctors trained is significantly large for a relatively new program in the span of 7 years. Furthermore, through this collaboration a local nephrology training program has been successfully established with great potential for continued nephrology training and expan-

sion of local expertise. The absence of a brain-drain phenomenon and the coordinated efforts among graduates consolidate the lasting impact this program exerts in the evolution of nephrology practice both locally and regionally.

This collaboration is similar to the ISN Sister Renal Centers Program, which supports renal centers in resource-limited countries, and may be adopted by the ISN to support and establish nephrology training in medical training institutions in developing countries by forging links with medical training institutions in those countries. ISN education ambassadors may play the role of visiting faculty for the training programs established, with a great impact of multiplying the number of trained nephrologists in sub-Saharan Africa and other resource-limited settings.

DISCLOSURE

F.F.F. and P.J.R. were trained in this program.

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