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Nephrology in Africa: forgotten no more



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During a time when the world is grappling with the coronavirus disease 2019 pandemic, African nephrology suffered a major setback, with the passing of 3 of its stalwarts: Oladipo Akinkugke (Nigeria), Jacob Plange-Rhule (Ghana)—whose obituaries are featured in this issue—and Mohamed Abdullah (Kenya). These individuals bookend the period during which nephrology took roots in the continent. This editorial discusses the highlights of African nephrology during this development phase and recalls some of the individuals who made them possible.

Africa, home to 1.34 billion people distributed over 54 countries,^{S1} has been called the cradle of humanity. Despite being endowed with immense natural and human resources as well as great cultural, ecological, and economic diversity, Africa remains the most underdeveloped of all continents. Africa's share of global income has been dropping consistently, and African countries occupied 30 of the 32 lowest spots on the 2018 United Nations Human Development Index.^{S2}

Africa has the youngest (median age, 18 years) and most rapidly growing (annual growth rate, 2.5%) population in the world.^{S1} Infectious diseases and neonatal and/or maternal deaths are the major causes of death and disability.¹ An overwhelming majority of global deaths attributable to tuberculosis, malaria, and HIV infections occur in Africa. At the same time, the burden of noncommunicable diseases, including kidney diseases, is also rising.¹ According to the Global Burden of Disease Study, apart from a few countries in Central America and Southeast Asia, African countries have the highest age-standardized rates of disability-adjusted life years attributable to chronic kidney disease.²

Africa also has a large burden of acute kidney injury, caused by infections acquired in the community, diarrheal diseases, complications of pregnancy, and consumption of herbal remedies. Lack of access to treatment leads to premature loss of a large number of lives.³

Delivery of health care in Africa presents major challenges, with a shortage of human resources, poor allocation of health care, and lack of infrastructure and political will coming out on top.⁴ Ongoing civil wars, religious and ethnic conflicts, misrule, corruption, and military interventions have forced a large number of people to seek refugee status in neighboring countries. More than a quarter of world's refugees are in Africa. The skilled and the educated often emigrate to western countries, further exacerbating the human resource shortage. Africa's largest export has been said to be its health care expertise.

As a result, specialty development, including that of nephrology, has been stunted. Even today, the median nephrologist density in Africa is less than 1 per million population, compared with a global average of 8.83 per million population.⁵ Several countries have no nephrologist. This is accompanied by shortages of allied health care professionals and lack of technical expertise.

In this background we appreciate the remarkable and extraordinary contributions of individual leaders toward development of kidney care in Africa. Many of these leaders trained in the west, came back to their native lands, and set up renal services.

Africa has seen growth in kidney care services, ever since the first hemodialysis in Johannesburg in 1957 and Ain Shams University Hospital, Cairo, in 1958, and the first kidney transplants in Johannesburg in 1966, Khartoum in 1974, and Cairo in 1976.^{S3,S4} Subsequently, services started in other countries, and today, hemodialysis is available in almost all countries. Access is highly restricted, however, with just approximately 1% of all incident patients continuing hemodialysis 1 year later in sub-Saharan Africa. Peritoneal dialysis (PD) is gradually increasing, but only South Africa, Sudan, and Tunisia have well-established PD programs. Kidney transplantation is increasing in Africa and is largely from living donors, with deceased donor

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transplants limited to North Africa (Egypt, Morocco, Tunisia, Algeria, Libya) and South Africa.

The South African Renal Society and the Egyptian Society of Nephrology and Transplantation were founded in 1967 and 1970, respectively. The African Association of Nephrology (AFRAN) was born in Cairo in February 1987 during the first International Society of Nephrology (ISN)--sponsored "African Kidney and Electrolytes conference," which was attended by 208 participants from 13 African countries, and had a strong ISN presence (Donald Seldin, Klaus Thurau, Robert Schrier). Rashad Barsoum was elected its first president.^{S5} AFRAN holds biennial congresses, alternating between Anglophone and Francophone countries, has an established journal, and is developing a registry.

Oladipo Akinkugbe (Nigeria),⁶ Mohamed Abdullah (Kenya), Rashad Barsoum (Egypt), Zaid Driss (Morocco), Ben Ayed, Ben Maiz and Aziz el Matri (Tunisia), Yackoob Seedat and Anthony Meyers (South Africa), and Omar Abboud, Hasan Abu-Aisha, and Salma Suleiman (Sudan) pioneered nephrology education in the 1970s. Subsequently, Saraladevi Naicker (Johannesburg) and Mignon McCulloch (Cape Town) established training programs for adult and pediatric nephrology, respectively, and enthusiastically embraced ISN-sponsored Fellows from other African countries. Boucar Diouf established a training center in Dakar (Senegal) for physicians from Francophone countries.

Seminal research was conducted on the epidemiology and clinical aspects of hypertension by Oladipo Akinkugbe,⁶ Yackoob Seedat (South Africa),^{S6} and Jacob Plange-Rhule (Ghana).^{S7} The work of a lifetime by Rashad Barsoum⁷ has immensely contributed to the understanding of kidney disease caused by schistosomiasis. The unique pattern of glomerulonephritis in Africa was described by Yackoob Seedat and Rajendra Bhimma^{S8} (South Africa). The *Maladie Rénale Chronique au Maroc* (MAREMAR) Study,⁸ led by Mohammed Benghanem Gharbi (Morocco) and Marc De Broe (Belgium), was conducted as a collaboration between the Moroccan government, ISN, the Moroccan Society of Nephrology, and the World Health Organization. This is the largest population-based study that determined the prevalence of chronic kidney disease and its risk factors in Morocco. A number of researchers studied kidney

involvement in HIV infection,^{S9,S10} and Dwo-moa Adu (Accra, Ghana) set up the H3Africa Kidney Disease Research Network^{S11} to study the genetics of kidney disease in Africa.

The International Society of Nephrology, through its capacity-building programs, has supported training of fellows and knowledge exchange for setting up renal services in Africa. Jean-Pierre Grunfeld (France) and Rashad Barsoum (Egypt) were the first chairs of the Africa Committee of ISN's Commission for the Global Advancement of Nephrology (COMGAN),^{S12} later replaced by the Global Outreach (GO) Programs and the ISN Regional Board. They were succeeded by Saraladevi Naicker (South Africa), Omar Abboud (Sudan), Mohammed Benghanem Gharbi (Morocco), and Charles Swanepoel (South Africa).

John Dirks, William Couser, and John Feehally, successive chairs of the ISN Programs, made a numbers of site visits with other ISN leaders, organized continuing medical education programs, and held meetings with leaders in education and health to emphasize the need of developing expertise and renal services. The first site visits in 2001 by Naicker and Dirks to Nigeria, Ghana, and Kenya (facilitated by Ebum Bamgboye for Nigeria and John Eastwood for Ghana) included meetings with the 3 leaders that we sadly lost this year—Professor Oladipo Akinkugbe in Ibadan, the doyenne of medical education and training in Nigeria, Jacob Plange-Rhule, in Kumasi, Ghana, as a potential mentor and local partner, and Professor Mohamed Abdullah, the leader of medical education and nephrology in Kenya and East Africa.

The ISN message of education and training in nephrology was enthusiastically received by the African medical community, and its programs were increasingly subscribed. In earlier years, ISN Fellows used to travel to western countries for training. This changed in 1999, when Yewondwossen Tadesse from Addis Ababa, Ethiopia, elected to train in Durban, South Africa, with Saraladevi Naicker. This started the new south-south initiative of ISN. Since then, 86 African fellows have trained in South Africa and India.

Of the 223 ISN fellows from Africa, most have returned to their countries and set up independent services. They have created an ISN Fellow's network and stay connected through social media, discuss clinical problems, and develop collaborations. In 2020, the ISN started a reverse Fellowship scheme, and 2 fellows from

Table 1 | ISN capacity-building programs in Africa

	Fellowship	Sister renal center ^a	Education ambassador ^b	Continuing medical education	Clinical research ^a
Before 2000	41				
2001–2010	63	5	5	61	7
2011–2020	119	40	56	66	29

Started in ^a2005, ^b2009.

Australia and United Kingdom were selected to spend 1 year in Africa. The Sister Renal Center and Education Ambassador Programs have helped setting up new nephrology services.⁹

The first ISN Africa Nephropathology workshop in 2001 was organized by Mohamed Abdullah, Ahmed Twahir, and Saraladevi Naicker in Nairobi, Kenya and supported by nephropathologists Jan Weening (Amsterdam), Prabha Naidoo (Durban), and Maureen Duffield (Cape Town). The workshop was attended by clinicians and pathologists.

The World Congress of Nephrology (WCN) in Cape Town in 2015, the first time this event was held in Africa, marked the coming of age of African nephrology and was a resounding scientific and social success. The Congress was cohosted by the South African Renal Society, AFRAN and ISN, with Pierre Ronco (France) as the scientific committee chair and Charles Swanepoel as the local organizing committee chair. The collaboration ensured a unique African flavor, with Archbishop Emeritus Desmond Tutu giving an insightful and entertaining address at the Opening Ceremony.

The WCN also marked the kicking off of intervention nephrology training in Africa. The ISN Intervention Nephrology Working Group—under the leadership of Tushar Vachharajani (United States)—has conducted a series of workshops in collaboration with AFRAN, and the International Society of Haemodialysis. The ISN Allied Health Professionals Working Group spearheaded by Marie Richards (Dubai) has made notable contributions toward training of nurses.

Recognizing the need to support service delivery, ISN launched the *Saving Young Lives* (SYL) program in 2012 as a proof-of-principle to demonstrate that it was possible to set up sustainable PD programs to treat acute kidney injury in very low-resource settings.¹³ The program was started in Moshi, Tanzania, in partnership with the International Pediatric Nephrology Association, the International Society for Peritoneal Dialysis, EuroPD, and the Sustainable Kidney Care Foundation. It has a strong component of education; to date 75 nurses and physicians have

been trained in PD catheter insertion, PD fluid prescription, and clinical problem solving. Learnings from Africa prompted expansion of the SYL program to other parts of the world.

Table 1 provides a summary of the ISN capacity-building programs supported in Africa.

The enthusiasm with which the ISN fellows have established programs and emerged as leaders in nephrology and medicine in their respective countries augurs well for the growth of nephrology in Africa. Advocacy by nephrologists and patients is leading to an increase in access to dialysis and transplantation. There is increased focus on kidney disease prevention and in research in kidney conditions. There is still a long way to go, but the mood has changed from “nothing can be done” to “we can and will do.”

SUPPLEMENTARY MATERIAL

[Supplementary File \(PDF\)](#)

Supplementary References.

REFERENCES

- Gouda HN, Charlson F, Sorsdahl K, et al. Burden of non-communicable diseases in sub-Saharan Africa, 1990–2017: results from the Global Burden of Disease Study 2017. *Lancet Glob Health*. 2019;7:e1375–e1387.
- Xie Y, Bowe B, Mokdad AH, et al. Analysis of the Global Burden of Disease study highlights the global, regional, and national trends of chronic kidney disease epidemiology from 1990 to 2016. *Kidney Int*. 2018;94:567–581.
- Olowu WA, Niang A, Osafo C, et al. Outcomes of acute kidney injury in children and adults in sub-Saharan Africa: a systematic review. *Lancet Glob Health*. 2016;4:e242–e250.
- Oleribe OO, Momoh J, Uzochukwu BS, et al. Identifying key challenges facing healthcare systems in Africa and potential solutions. *Int J Gen Med*. 2019;12:395–403.
- Naicker S, Eastwood JB, Plange-Rhule J, Tutt RC. Shortage of healthcare workers in Sub-Saharan Africa: a nephrological perspective. *Clin Nephrol*. 2010;74(S1):129–133.
- Akinkugbe OO. World epidemiology of hypertension in blacks. *J Clin Hypertens*. 1987;3(3 Suppl):15–85.
- Barsoum R. Schistosomal glomerulopathies. *Kidney Int*. 1993;44:1–12.
- Gharbi MB, Elseviers M, Zamd M, et al. Chronic kidney disease, hypertension, diabetes, and obesity in the adult population of Morocco: how to avoid “over”- and “under”-diagnosis of CKD. *Kidney Int*. 2016;89:1363–1371.
- Feehally J. A unique role in global nephrology: The International Society of Nephrology, 2011–2020. *Kidney Int*. 2020;98:253–260.