



Challenges for sustainable end-stage kidney disease care in low-middle-income countries: the problem of the workforce

Charles R. Swanepoel¹, Mignon I. McCulloch², Georgi Abraham³, Jo-Ann Donner⁴, Mona N. Alrukhaimi⁵, Peter G. Blake^{6,7}, Sakarn Bunnag⁸, Stefaan Claus⁹, Gavin Dreyer¹⁰, Mohammad A. Ghnaimat¹¹, Fuad M. Ibhais¹², Adrian Liew^{13,14}, Marla McKnight^{15,16,17}, Yewondwossen Tadesse Mengistu¹⁸, Saraladevi Naicker¹⁹, Abdou Niang²⁰, Gregorio T. Obrador²¹, Jeffrey Perl^{22,23}, Harun Ur Rashid²⁴, Marcello Tonelli^{25,26}, Kriang Tungsanga^{27,28}, Tushar Vachharajani^{29,30}, Elena Zakharova^{31,32,33}, Carlos Zuniga³⁴ and Fredric O. Finkelstein³⁵

¹Division of Nephrology and Hypertension, Department of Medicine, Faculty of Health Sciences, University of Cape Town, Cape Town, South Africa; ²Paediatric Intensive and Critical Unit, Red Cross War Memorial Children's Hospital, University of Cape Town, Cape Town, South Africa; ³Nephrology Division, Madras Medical Mission Hospital, Pondicherry Institute of Medical Sciences, Chennai, India; ⁴International Society of Nephrology, Brussels, Belgium; ⁵Department of Medicine, Dubai Medical College, Dubai, United Arab Emirates; ⁶Ontario Renal Network, Toronto, Ontario, Canada; ⁷Division of Nephrology, University of Western Ontario and London Health Sciences Centre, London, Ontario, Canada; ⁸Division of Nephrology, Department of Internal Medicine, Rajavithi Hospital, Bangkok, Thailand; ⁹Nephrology Division, Ghent University Hospital, Ghent, Belgium; ¹⁰Department of Nephrology, Barts Health National Health Service Trust, London, UK; ¹¹Nephrology Division, Department of Internal Medicine, The Specialty Hospital, Amman, Jordan; ¹²Yatta Governmental Hospital, Yatta, Palestine; ¹³Department of Renal Medicine, Tan Tock Seng Hospital, Singapore; ¹⁴Lee Kong Chian School of Medicine, Imperial College London-Nanyang Technological University, Singapore; ¹⁵Renal Division, Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts, USA; ¹⁶Division of Global Health Equity, Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts, USA; ¹⁷Program in Global Noncommunicable Disease and Social Change, Department of Global Health and Social Medicine, Harvard Medical School, Boston, Massachusetts, USA; ¹⁸School of Medicine, Addis Ababa University, Addis Ababa, Ethiopia; ¹⁹School of Clinical Medicine, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa; ²⁰Department of Nephrology, Dalal Jamm Hospital, Cheikh Anta Diop University Teaching Hospital, Dakar, Senegal; ²¹Faculty of Health Sciences, School of Medicine, Universidad Panamericana, Mexico City, Mexico; ²²Division of Nephrology, St. Michael's Hospital and the Keenan Research Centre in the Li Ka Shing Knowledge Institute, St. Michael's Hospital, Toronto, Ontario, Canada; ²³Division of Nephrology, Department of Medicine, University of Toronto, Toronto, Ontario, Canada; ²⁴Department of Nephrology, Kidney Foundation Hospital and Research Institute, Dhaka, Bangladesh; ²⁵Department of Medicine, University of Calgary, Calgary, Alberta, Canada; ²⁶Pan-American Health Organization/World Health Organization's Collaborating Centre in Prevention and Control of Chronic Kidney Disease, University of Calgary, Calgary, Alberta, Canada; ²⁷Division of Nephrology, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand; ²⁸Bhumirajanagarindra Kidney Institute, Bangkok, Thailand; ²⁹Nephrology Section, Salisbury Veterans Affairs Health Care System, Salisbury, North Carolina, USA; ³⁰Division of Nephrology and Hypertension, Department of Medicine, School of Medicine, University of North Carolina Chapel Hill, North Carolina, USA; ³¹Department of Nephrology, Moscow City Hospital named after S.P. Botkin, Moscow, Russian Federation; ³²Department of Nephrology, Moscow State University of Medicine and Dentistry, Moscow, Russian Federation; ³³Department of Nephrology, Russian Medical Academy of Continuous Professional Education, Moscow, Russian Federation; ³⁴School of Medicine, Catholic University of Santísima Concepción, Advanced Renal Care Unit - Las Higueras Hospital, Talcahuano, Chile; and ³⁵Department of Medicine, Yale University, New Haven, Connecticut, USA

Prevention and early detection of kidney diseases in adults and children should be a priority for any government health department. This is particularly pertinent in the low-middle-income countries, mostly in Asia, Africa, Latin America, and the Caribbean, where up to 7 million people

die because of lack of end-stage kidney disease treatment. The nephrology workforce (nurses, technicians, and doctors) is limited in these countries and expanding the size and expertise of the workforce is essential to permit expansion of treatment for both chronic kidney disease and end-stage kidney disease. To achieve this will require sustained action and commitment from governments, academic medical centers, local nephrology societies, and the international nephrology community.

Correspondence: Charles R. Swanepoel, University of Cape Town, Groote Schuur Hospital, Anzio Road, Observatory, Cape Town, 7945, South Africa. E-mail: caswan@absamail.co.za

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Prevention and early detection of chronic kidney disease (CKD) and strategies to slow progression of CKD in adults and children should be a priority for any government health department. This is particularly pertinent in the low-middle-income countries (LMICs). However, despite such efforts to manage CKD, there will be an increasing burden of patients developing end-stage kidney disease (ESKD). Meeting the needs of these patients presents many ethical, financial, and practical challenges. Among these challenges is the problem of developing and training an adequate workforce to permit the creation and expansion of existing ESKD facilities, as well as to treat kidney diseases at all stages. How can this best be achieved in LMICs given their limited resources? This review describes a number of existing models and innovations that form the basis of a future strategic approach to this problem.

Current status

It has been estimated that up to 7 million people, mostly from LMICs in Asia, Africa, Latin America, and the Caribbean, die due to lack of dialysis facilities.¹ Furthermore, it is forecast that the number of patients receiving dialysis in Asia, Africa, Latin America, and the Caribbean would double by 2030.¹ Meeting this need will require developing and expanding ESKD facilities. The creation of sustainable dialysis facilities and kidney transplant centers is hampered not only by socioeconomic and geographic factors, but also by lack of an adequate supply of and trained workforce, including technicians, doctors, pathologists, and nurses. Some details concerning the limited workforce in LMICs are well documented in the International Society of Nephrology (ISN) Global Kidney Health Atlas.²

Opportunities and challenges

Workforce expansion in LMICs is essential if ESKD services are to increase. Transplantation, the best and most cost-effective treatment, requires a workforce trained in surgical techniques, appropriate laboratory support, nephrology support, dialysis back-up, and specialized nursing care. Provision of hemodialysis (HD) services requires trained physicians, nurses, and technicians who understand the basic principles of HD, water treatment, dialyzer reprocessing, infection control, access creation, and kinetics of solute and water removal. In addition, fundamental issues involved in patient care need to be understood, including the management of various metabolic parameters, anemia treatment, volume and blood pressure control, management and avoidance of hypotensive episodes, as well as HD emergencies. Training workforce personnel to manage peritoneal dialysis (PD) involves learning a somewhat different skill set in addition to the basic principles of ESKD care, including placement and management of PD catheters, understanding how to train and support patients for home therapy, treating peritonitis and exit-site infections, and managing ultrafiltration while limiting dextrose exposure.

How can this workforce training be provided? Organizing training within a country or region would be ideal using trained individuals who are on site. This could be provided by the government, academic centers, dialysis facility owners, philanthropic organizations, and/or nephrology societies. The major strategy to attract qualified trained nephrologists and dialysis nurses to low-income countries and LMICs would include the establishment of an infrastructure supportive of dialysis care and transplantation in those countries. This is challenging because such an infrastructure requires funding. The funding must be sustainable and preferably from government budgets. The education of these various governments is important for sustainable funding. Such government education can be achieved by utilizing examples set by successful nongovernmental organizations' programs and international societies (ISN's Saving Young Lives Program, discussed later, is such a program). Patients must also be encouraged to demand the care they need and, in so doing, force the implementation of public health policies.³

Involvement by industry via the formation of public-private partnerships or public-private investments, with appropriate government oversight, is another approach. For these ventures to be successful, training of staff is essential, and industry should be contractually obligated to provide adequate training for doctors, technicians, and nurses. Examples of cooperative public-private partnerships or public-private investments programs are to be found in India,⁴ Russia,⁵ Mexico,⁶ and Swaziland (CR Swanepoel, personal communication, 2018).

International organizations and academic medical centers can provide support for training of staff and for developing programs for ESKD therapy. The major international nephrology organizations and several academic medical centers have played an important role in this regard.

International Society of Nephrology

The ISN supports various educational initiatives to assist with training of staff, including ISN educational ambassador programs, sister renal centers, continuing medical education (CME) programs, fellowships for personnel from LMICs to train for up to 2 years in an advanced educational environment, and the online education resource, the ISN Academy. The ISN Educational Ambassadors Program sends experts to developing renal centers for 1 to 4 weeks to provide specific hands-on training or to help develop new services. The ISN Sister Renal Centers Program links academic centers in LMICs to well-established academic centers with well-run nephrology programs, providing valuable academic support in the development of nephrology services, including the training of workforce personnel. About 40 CME programs are supported by the ISN annually, with a recent emphasis on regional CME programs, encouraging a dialogue among participants from the region to share experiences. The ISN provides funding for about 60 to 80 fellows per year to receive training in academic centers in high-resource countries; most of these ISN Fellows return to their country of origin and