

## Advancing equitable access to care and strengthening workforce development for kidney health in Rwanda: National Symposium proceedings, March 15, 2024

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### ABSTRACT

Kidney disease is a global health burden with significant economic and public health impacts. Rwanda's Kidney Diseases Management Symposium was a national-level gathering aimed at discussing the outcomes of existing renal programs and exploring approaches to advance and ensure equitable access to care and optimal medication practice for kidney health in Rwanda. The symposium brought together over 100 healthcare providers, academicians, researchers, patient representatives, and policymakers across Rwanda. Presentations, discussions, and roundtable sessions took place on the epidemiological and management aspects of acute kidney injury and chronic kidney disease, which are the most common renal diseases among the Rwandan population. Breakthrough discussions also took place on the establishment and impact of kidney transplantation programs in Rwanda. A common understanding of the achievements in renal disease management in Rwanda made in the last decade was reached. The symposium highlighted the importance of raising community awareness about kidney diseases, enforcing preventive practices and early detection programs, optimizing the availability and accessibility of renal medications, developing a renal registry for real-world data and practice, and bridging the health workforce shortage through training. Renal initiatives in Rwanda are overall operating effectively, with significant national and institutional support and commitment. By fostering partnerships and intersectoral collaborations, Rwanda is well on its way to universal access to kidney care and a sufficient workforce to meet the needs of the population.

**Keywords:** Acute Kidney Injury, Chronic Kidney Disease, Renal Dialysis, Transplantation, Rwanda

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## INTRODUCTION

Kidney diseases continue to pose public health threats, causing morbidity, mortality, and economic constraints worldwide. Globally, in 2019, 850 million people worldwide were affected by kidney diseases, a number higher than HIV or diabetes patients, though all age groups and races are at risk, with disadvantaged people being affected the most [1]. Furthermore, the global pooled prevalence of chronic kidney disease among men is 10.4% and among women is 11.8% [2]. In Africa, the overall prevalence of chronic kidney diseases is 15.8% (95% CI 12.1-19.9) for stages 1-5 and 4.6 % (95% CI 3.3-6.1) for stages 3-5 [3]. Despite the global and regional efforts to address the determinants of chronic kidney diseases, it is projected to step from the 10th leading cause of death in 2020 to the 5th in 2040 [4], driven by factors like nutrition transition, urbanization, and natural secular trends [5].

With the limited data available in Rwanda, the prevalence of chronic kidney diseases ranges between 4% and 24% based on albuminuria [6], and the estimated death rate rose to 2.08% in 2020. Life expectancy for the Rwandan population is 69.8 years in 2024, while the combined life expectancy at birth for both sexes stood at 51.2 years in 2002. According to the 2022 STEPS survey conducted by the Rwanda Biomedical Centre (RBC), the prevalence of hypertension, impaired fasting glycemia, and raised total cholesterol were 16.2%, 4.2%, and 3%, respectively. Additionally, 48.1 percent of Rwandans currently drink alcohol. These are factors that lead to kidney diseases. Rwanda's national non-communicable diseases (NCD) cost strategic interventions include raising community awareness about risk factors prevention and screening, scaling up NCD treatment services to at least 50% of people who need them, strengthening the surveillance system, and boosting intersectoral collaboration with the target of reducing NCD premature mortality by 25% in 2025 [7]. Furthermore, significant efforts have been invested so far to address the renal disease burden in Rwanda specifically. This includes the establishment of new programs, including living donor kidney transplantation, as well as both renal transplant surgery and nephrology fellowship training programs through the University of Rwanda. Despite this, challenges still exist, including a current shortage of specialized

health workforce exacerbated by funding gaps [8], inadequate infrastructure, and the high cost of kidney-related medical services.

To highlight these challenges and collaboratively pave the way forward, the Rwanda Renal Association organized a national symposium in collaboration with RBC to conclude week-long screening activities undertaken in line with the World Kidney Week 2024's theme, "Kidney Health for All". The symposium emphasized many key issues, especially advancing equitable access to care and optimal medication practice, whereby the health professionals, academia, policymakers, patient representatives, healthcare insurers, and other stakeholders shared insights on the best practices, discussed the latest renal field achievements and made recommendations to address current challenges. This report highlights the proceedings of the national symposium held in Kigali, Rwanda. It stresses the pivotal points presented in the sessions on the state of nephrology, acute kidney injury, chronic kidney diseases, renal transplantation surgery, and the accessibility, distribution, and utilization of renal medication in Rwanda.

## SYMPOSIUM CONDUCT

A one-day "Kidney Diseases Management" national-level was organized by Rwanda Renal Organization (RRO) in collaboration with Rwanda Biomedical Center (RBC) and held on March 15, 2024, at Four Points by Sheraton Hotel located in Kigali city, Rwanda. It followed a dynamic schedule of PowerPoint presentations, roundtable and panel discussions, and question-and-answer sessions. Fifteen theoretical and evidence-based presentations were made, along with two-panel sessions, including one with a kidney donor and recipient pair, who shared their testimonials in the transplantation journey. Over 100 participants from academic institutions, public hospitals, pharmaceutical companies, government and private institutions, media, and patient representatives from across Rwanda attended the symposium.

Across all presentations, the key themes raised by presenters included the state of nephrology in Rwanda, kidney disease screening and management, the recently established kidney transplantation program, and the accessibility and utilization of renal medication.

**The State of Nephrology in Rwanda:** Nephrology programs have a long history with major developments leading to treating chronic renal failure [9]. Over the past decade, African countries have made a remarkable evolution in overcoming the non-availability of training centers and resources, treatment facilities, and financial constraints, among other barriers hindering nephrology programs [10–12]. Within the last two decades, the nephrology program in Rwanda has significantly improved, transitioning from peritoneal dialysis as the first available modality of kidney replacement to haemodialysis and living donor kidney transplant today. A presentation on the state of adult nephrology in Rwanda indicated that there are 8 hemodialysis units and 1 kidney transplant center for the population of 13.8 million. Regarding the workforce, there are currently 3 adult nephrologists, 1 pediatric nephrologist, and 1 renal pathologist. Additionally, through the University of Rwanda, a nephrology fellowship program was established, which currently has 3 fellows. The University also offers a renal nursing program with 16 students.

Alongside the fellowship programs for clinicians, nephrology nurses are an integral part of quality care for patients with acute kidney injury (AKI) and end-stage renal diseases (ESRD) [13]. The global gap in specialized nephrology nurses exists, especially in low- and middle-income countries (LMICs) [13]. Rwanda's Ministry of Health aims to increase the number of trained nephrology nurses to 38 by 2030. To date, there are 8 nephrology nurses allocated in 4 referral hospitals, as well as 4 working at the University of Rwanda. As presented in the symposium, the master of nephrology nursing program based at the University of Rwanda is working to overcome the workforce shortage, define the scope of the practice to guide the trained nurses, and expose students to high-volume care centers.

#### **Kidney Disease Screening and Management:**

At the national level within RBC, a specific department is responsible for programming, planning, funding, policymaking, medicine supply chain, and coordinating chronic kidney disease (CKD) interventions. Among its tasks include the development of clinical guidelines for the prevention, management, and control of kidney diseases, as well as improving standards of care. Additionally, the department conducts community

interventions to raise awareness about CKD, focusing on prevention and early detection. It also oversees the coordination of CKD care in health facilities, mainly in district hospitals. Ensure suspect case identification at HCs and timely referrals. Furthermore, the National CKD Program has implemented a functional Electronic Medical Record (EMR) system in all district hospitals, provincial, referral centers, and ongoing efforts to include health centers, health posts and community health workers.

In line with the early detection and management of CKD among patients with chronic diseases in Partners in Health-supported districts, a screening program was launched in March 2023. Approximately 3,039 patients with NCDs, HIV, or both, followed at Rwinkwavu Hospital, were screened. The symposium appreciated that initial testing and 3-month retesting yielded an overall prevalence rate of CKD of 12.19% and 34.7%, respectively. Despite the positive contributions of the screening program, including the linkage of the most probable cases to care, there is an urgent need to raise the awareness of both healthcare providers and patients and expand CKD screening programs to other NCD clinics in Rwanda and the general population as well [14].

The symposium concluded the continuous community kidney disease screening program that had been undergoing at the health facility levels and communities in both Kigali city and provinces (Kigali University Teaching Hospital, Rwanda Military, Biryogo Car-free Zone, and Shyorongi Health Center). The targets were the common risk factors for kidney disease, namely obesity, high blood sugar, high blood pressure, and proteinuria. The predictor measurements taken were weight (kg), height (cm), arterial blood pressure (mmHg), random blood sugar (g/dl), and random urine dipstick proteinuria. Samples of more than 1,400 participants were collected and analyzed by trained healthcare professionals. Depending upon the results, the participants took nutrition counseling and education, coupled with the nephrologist's individualized advice.

**Kidney Transplantation in Rwanda:** Kidney transplant surgery is a newly established program to divert the cost and complications of dialysis and medical referrals abroad, promote medical tourism, and improve surgical outcomes, while empowering Rwanda's health workforce [15]. In

2023, Rwanda launched a living donor kidney transplant program at King Faisal Hospital Rwanda, and the program has performed 28 successful transplants as of May 2024. When reflecting on the program at the Symposium, one of Rwanda's kidney donors testified, "kidney donation is a personal choice made with the only intention of helping the patient." On the other hand, the recipient affirmed his "resumption of daily activities and overall improved quality of life post-transplant."

In addition to that, the symposium delivered a tutorial on pre-operative kidney donor and recipient evaluation, from the major histopathological to psychosocial, and medico-surgical evaluations. Establishing a living donor transplant in Rwanda while upholding internationally acceptable ethical and regulatory requirements was a major task. Participants noted that the legal framework and regulatory oversight system in place ensure program effectiveness and safety, prevent organ commercialization and trafficking, and promote public support and confidence. Prospects involve sustaining the programs through equitable access and system coordination and bridging the graft shortage with the deceased donation program.

**Accessibility of Renal Medication:** Studies indicate that nearly 2 billion people, including kidney patients, do not have access to essential medications, particularly in LMICs [16]. In Rwanda, medicines are available at different levels of service provision, but affordability remains a challenge in some areas [17]. Medical insurance, including community-based health insurance (CBHI), covers the costs of medicine and care costs according to the established essential list of medicine and care by the level of care provision. This means that some tests are even permissible and covered at health centers. As the level of health facilities increases, the more the list of covered medicine and care is expanded. The existing measures intend to foster an equitable supply management chain and ensure fair and uninterrupted distribution. The inclusion of kidney transplants into the services covered by CBHI is an ideal approach to raising the standard of renal health care in Rwanda [18].

## CONCLUSION

The symposium acknowledged kidney health as a cornerstone of public health. Efforts made by the

government of Rwanda and various stakeholders to improve the health of Rwanda's population in the past decades are commendable, especially in relation to universal renal health coverage. The key recommendations put forth by the symposium are: (1) Raising kidney health awareness among the community and providers; (2) Improving care to individuals with non-communicable diseases; (3) Setting a robust renal research agenda at the institutional levels and collaborative partnership; (4) Continuing to develop the health workforce, and fostering a global network of trained nephrology professionals; (5) Accelerating the effort to enhance renal registries as a key tool to monitor and inform decisions; and (6) Reviewing and revising the existing insurance policies among others to cover more dialysis sessions and copayment modalities for patients with ESRD requiring dialysis or kidney transplant. Through these recommendations, participants highlighted that these efforts will collectively transform kidney health in Rwanda and expand upon the significant progress already made in this area.

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## REFERENCES

1. Jager, K.J.; Kovesdy, C.; Langham, R.; Rosenberg, M.; Jha, V.; Zoccali, C. A Single Number for Advocacy and Communication—Worldwide More than 850 Million Individuals Have Kidney Diseases. *Nephrol. Dial. Transplant.* 2019, 34, 1803–1805, doi:10.1093/ndt/gfz174.
2. Kovesdy, C.P. Epidemiology of Chronic Kidney Disease: An Update 2022. *Kidney Int. Suppl.* 2022,

- 12, 7–11, doi:10.1016/j.kisu.2021.11.003.
3. Kaze, A.D.; Ilori, T.; Jaar, B.G.; Echouffo-Tcheugui, J.B. Burden of Chronic Kidney Disease on the African Continent: A Systematic Review and Meta-Analysis. *BMC Nephrol.* 2018, 19, 125, doi:10.1186/s12882-018-0930-5.
4. Ulasi, I.I.; Awobusuyi, O.; Nayak, S.; Ramachandran, R.; Musso, C.G.; Depine, S.A.; Aroca-Martinez, G.; Solarin, A.U.; Onuigbo, M.; Luyckx, V.A.; et al. Chronic Kidney Disease Burden in Low-Resource Settings: Regional Perspectives. *Semin. Nephrol.* 2022, 42, 151336, doi:10.1016/j.semnephrol.2023.151336.
5. Lancet Urbanisation, Inequality, and Non-Communicable Disease Risk. *Lancet Diabetes Endocrinol.* 2017, 5, 313, doi:10.1016/S2213-8587(17)30116-X.
6. Ngendahayo, F.; Mukamana, D.; Ndateba, I.; Nkurunziza, A.; Adejumo, O.; Chironda, G. Chronic Kidney Disease (CKD): Knowledge of Risk Factors and Preventive Practices of CKD among Students at a University in Rwanda. *Rwanda J. Med. Health Sci.* 2019, 2, 185–193, doi:10.4314/rjmhs.v2i2.15.
7. UNEP-LEAP National Strategy and Costed Action Plan for the Prevention and Control of Non-Communicable Diseases in Rwanda (2020–2025). | UNEP Law and Environment Assistance Platform Available online: <https://leap.unep.org/en/countries/rw/national-legislation/national-strategy-and-costed-action-plan-prevention-and-control> (accessed on 2 May 2024).
8. Delisle, H. The Human Resources for Health Program in Rwanda – Reflections on Achievements and Challenges; Comment on “Health Professional Training and Capacity Strengthening Through International Academic Partnerships: The First Five Years of the Human Resources for Health Program in Rwanda.” *Int. J. Health Policy Manag.* 2019, 8, 128–131, doi:10.15171/ijhpm.2018.114.
9. Blagg, C.R. The Early History of Dialysis for Chronic Renal Failure in the United States: A View From Seattle. *Am. J. Kidney Dis.* 2007, 49, 482–496, doi:10.1053/j.ajkd.2007.01.017.
10. Davis, S.O.; Zubair, A.; Igbokwe, M.; Abu, M.; Chiedozi, C.-A.; Sanni, Q.; Jesuyajolu, D. A Scoping Review of Kidney Transplantation in Africa: How Far Have We Come? *World J. Surg.* 2023, 47, 1, doi:10.1007/s00268-023-07042-0.
11. George, C.; Stoker, S.; Okpechi, I.; Woodward, M.; Kengne, A. The Chronic Kidney Disease in Africa (CKD-Africa) Collaboration: Lessons from a New Pan-African Network. *BMJ Glob. Health* 2021, 6, e006454, doi:10.1136/bmjgh-2021-006454.
12. Okpechi, I.; Niang, A.; Hafez, M.; Ashuntantang, G.; Zaidi, D.; Ye, F.; Abdu, A.; Asinobi, A.; Balogun, R.; Chukwuonye, I.; et al. A Roadmap for Kidney Care in Africa: *Afr. J. Nephrol.* 2022, 25, 82–100, doi:10.21804/25-1-5100.
13. Bennett, P.N.; Walker, R.C.; Trask, M.; Claus, S.; Luyckx, V.; Castille, C.; Ashuntantang, G.; Richards, M. The International Society of Nephrology Nurse Working Group: Engaging Nephrology Nurses Globally. *Kidney Int. Rep.* 2019, 4, 3–7, doi:10.1016/j.ekir.2018.10.013.
14. Africa Press Kayonza Survey: 10% of Patients with NCDs Unknowingly Have Chronic Kidney Disease. Rwanda 2024.
15. Ahmed, M.M.; Neil, K.L.; Gasana, A.G.; Leichtman, A.; Brown, L.; Tedla, F.; Satarino, C.; Sendegeya, A.; Rusanganwa, V.; Punch, J.; et al. Establishing a Kidney Transplantation Program in a Resource-Limited Country: The Experience of Rwanda. *Transplantation* 2024, 108, 1033, doi:10.1097/TP.0000000000004923.
16. Francis, A.; Hafidz, M.I.A.; Ekrikpo, U.E.; Chen, T.; Wijewickrama, E.; Tannor, E.K.; Nakhoul, G.; Wong, M.M.Y.; Pereira-Kamath, N.; Chanchlani, R.; et al. Barriers to Accessing Essential Medicines for Kidney Disease in Low- and Lower Middle-Income Countries]. *Kidney Int.* 2022, 102, 969–973, doi:10.1016/j.kint.2022.07.029.
17. Bizimana, T.; Kayumba, P.C.; Heide, L. Prices, Availability and Affordability of Medicines in Rwanda. *PLOS ONE* 2020, 15, e0236411, doi:10.1371/journal.pone.0236411.
18. Africa Press Kidney Transplants Now Covered under Mutuelle de Santé – RSSB. Rwanda 2024.