A roadmap for kidney health for South Africa in the context of universal health coverage

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Chronic kidney disease (CKD) in South Africa (SA) is a growing public health crisis, driven by the intersecting burdens of HIV, tuberculosis, hypertension, diabetes and obesity. In Black African populations, high-risk apolipoprotein L1 (*APOL1*) variants add a genetic predisposition to non-diabetic kidney diseases, compounding risk. Global recognition of CKD has recently advanced, marked by the 2025 World Health Organization (WHO) non-communicable disease resolution, which urges the integration of kidney care into national health strategies. This resolution emphasises prevention, early detection and treatment, while strengthening primary healthcare and addressing social determinants of health, particularly in low-income countries. However, in SA, domestic capacity has not kept pace. Public-sector dialysis slots have remained static since 1994, while the private sector has expanded rapidly, deepening inequities by province and income. In the public sector, dialysis is rationed to patients eligible for transplantation, yet transplant access is limited by organ shortages, logistical barriers and variable provincial resources. Expanding deceased donation and implementing kidney paired donation (KPD) programmes are essential to increase transplant opportunities, particularly for incompatible donor-recipient pairs, and to improve equity in access. Children and adolescents face additional barriers, including limited age-specific pathways and the absence of structured transition to adult care. Workforce shortages, inadequate regulatory oversight, inconsistent procurement processes and incomplete registry reporting undermine service quality, limit expansion and perpetuate inequities in access. Without urgent reform, CKD will continue to drive preventable morbidity, premature mortality and escalating costs. Scaling equitable dialysis and transplantation services, integrating KPD and investing in prevention, workforce and infrastructure are critical to reversing current trends and fulfilling the WHO's call for action.

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Chronic kidney disease (CKD) is an escalating public health crisis in South Africa (SA), driven by the intersecting burdens of communicable diseases, particularly HIV and tuberculosis, and non-communicable diseases (NCDs) such as hypertension, diabetes and obesity.[1] This syndemic is further compounded by a genetic predisposition to kidney disease in black African populations, notably through high-risk variants in the *apolipoprotein L1* (*APOL1*) gene.[2] These variants are strongly associated with non-diabetic kidney diseases, including HIV-associated nephropathy and focal segmental glomerulosclerosis, thereby significantly contributing to the national CKD burden.[3-6]

CKD, previously under-recognised, is now acknowledged as one of the fastest-growing causes of death among NCDs worldwide.[7,8] The inclusion of CKD in the World Health Organization (WHO)'s NCD framework (World Health Assembly resolution in May 2025) marked a pivotal shift in global health policy.[9] For the first time, CKD has been formally recognised alongside other major NCDs, correcting a long-standing gap in international health agendas. The resolution, titled 'Reducing the burden of non-communicable diseases through the promotion of kidney health and strengthening prevention and control of kidney disease,' acknowledges the substantial contribution of CKD to global morbidity, mortality and economic hardship.

The SA government has demonstrated commendable leadership in championing the inclusion of CKD in the forthcoming United Nations Political Declaration on NCDs. Its advocacy for the recent WHO resolution on kidney health reflects a growing national and regional commitment to addressing the burden of CKD. SA's role in advancing nephrology care and training across the continent is laying a strong foundation for regional progress. As international recognition of CKD continues to rise, there is a unique opportunity for health ministries, clinical leaders and global partners to work together to confront the growing impact of CKD in Africa. Given the significant economic and societal costs associated with CKD, it is imperative to strengthen policies that prioritise prevention, ensure equitable access to transplantation and support the use of cost-effective dialysis modalities.

The National Department of Health (NDoH) has recently embarked on a collaboration with nephrologists and other stakeholders to improve nephrology services and increase transplantation. This roadmap is our proposal on the priorities that need to be addressed.

The current challenges

Despite political commitment, persistent health system challenges threaten to undermine progress. The SA public sector's dialysis capacity has remained largely static since 1994.[10] In contrast, there has been a massive scale-up of private haemodialysis (HD) units over the same period, driven by market demand and private sector investment. This divergence has resulted in a striking and persistent inequity in access to dialysis between the public and private sectors.[11] HD is the predominant form of kidney replacement therapy (KRT) in SA, with its use in the private sector far exceeding that in the public sector, approaching rates seen in high-income countries. This reflects deep systemic disparities rooted in historical inequities, resource limitations and the high cost of private care.[10,12] Peritoneal dialysis (PD), while currently underutilised and primarily offered within the public sector, presents a valuable opportunity as a more cost-effective modality, particularly given its lower staffing requirements and potential for decentralised care.[13,14]

As of December 2022, notable provincial disparities in public sector dialysis prevalence persisted across SA, with services largely concentrated in urban centres and more densely populated provinces. The Western Cape Province reported the highest prevalence at 165 per million population (pmp), followed by Free State (94 pmp) and Northern Cape (77 pmp) provinces. In contrast, provinces such as Mpumalanga (3 pmp), Limpopo (14 pmp) and North West (17 pmp) recorded the lowest prevalence rates. These figures highlight ongoing inequities in access to KRT, including both dialysis and transplantation, underscoring the need for more equitable service distribution and investment across all provinces.[13]

This unequal distribution of care and access to KRT is reflected in patient outcomes. A study by Jardine *et al.*[15] highlighted significant provincial variation in 1-year survival among patients receiving KRT, a key finding with important implications for health system planning. Even after adjusting for demographic and clinical factors, patients from Northern Cape, Eastern Cape, Mpumalanga and Free State provinces experienced substantially higher mortality than those in the Western Cape. These disparities likely reflect broader differences in access to specialised nephrology services, healthcare infrastructure, workforce availability and underlying socioeconomic conditions.[15] This imbalance underscores the urgent need for strategic investment and service expansion within the public health system.

Workforce shortages remain a critical bottleneck. SA has a national nephrologist-to-population ratio of just 2.5 pmp, well below the international benchmark of 8 - 10 pmp. Some provinces have no full-time nephrologists in the state sector.[16] While all nephrology training occurs in the public sector, many newly qualified nephrologists migrate to private practice owing to limited posts, inadequate infrastructure and professional isolation in underserved regions. Without addressing these human resource constraints, efforts to expand dialysis services and improve CKD outcomes will remain severely hampered.

Compounding these workforce limitations are regulatory and procurement deficiencies that undermine service quality and system co-ordination. At present, there is no national policy framework or standardised quality assurance system governing the operation of dialysis units. The proliferation of small, unregulated dialysis centres, often lacking oversight, licensing and proper clinical governance raises concerns about quality of care, equity and sustainability. In addition, gaps in national procurement processes further compromise care delivery. Dialysis consumables are inconsistently included in national tender contracts, and frequent stockouts, expired supplies and procurement decisions made without adequate clinical input are common. These supply chain challenges disrupt continuity of care and place additional strain on already overburdened services. A comprehensive regulatory and procurement strategy aligned with clinical priorities and health system capacity is essential to ensure high-quality, equitable and sustainable kidney care.

Paediatric and adolescent challenges

The discussed challenges are compounded in the paediatric population. Children aged <18 years represent ~34% of SA's population (21 million individuals). However access to CKD care for this vulnerable group is markedly limited and underfunded.[17] Paediatric nephrology services remain underdeveloped, constrained by both inadequate infrastructure and a severe shortage of trained specialists. Currently, there are only 23 paediatric nephrologists nationwide, equating to just 0.38 pmp, and no state-funded training posts are currently available to increase this number.[18] Moreover, specialists are mostly concentrated in Gauteng, the Western Cape and KwaZulu-Natal provinces, leaving large geographical regions without paediatric nephrology care.

This challenge is further compounded by a critical gap in adolescent care, which frequently falls between the mandates of paediatric and adult services. In the state sector, children aged <13 years are managed in paediatric units, but new presentations from age 13 years are directed to adult services. Adolescents (13 - 21 years) are thus particularly vulnerable, with dialysis eligibility inconsistently applied and, in some provinces, access frequently denied. At Groote Schuur Hospital, Cape Town, a transition clinic addresses this gap by following patients up to 25 years, yet nationally the absence of structured transition pathways and co-ordinated handover between services disrupts continuity of care. Dedicated, multidisciplinary, age-appropriate models are urgently needed to ensure equitable kidney replacement therapy for young people across the country.

A parallel shortage of trained dialysis nurses, technologists, dietitians, social workers, counsellors and transplant co-ordinators further limits the quality and reach of services for both paediatric and adult patients alike.[19]

Dialysis rationing

Given these constraints, access to chronic KRT in the SA public sector is subject to strict rationing, with dialysis typically reserved for patients deemed eligible for kidney transplantation.[20] Availability is further constrained by the number of chronic dialysis slots. Access to dialysis is rationed even for children, with many provinces lacking paediatric dialysis services altogether. As a result, children often remain on dialysis for extended periods owing to low transplantation rates, placing them at increased risk of complications, impaired growth and developmental delays.[21]

The policy of conditional access to KRT reflects the complex challenge of meeting rising demand within the constraints of limited infrastructure and resources. While intended to support fair and transparent rationing, current prioritisation processes vary across provinces, are infrequently audited and are rarely open to formal challenge. In practice, this places the burden of life-and-death decisions on individual clinicians and facilities, often in the absence of standardised criteria, contributing to significant moral distress among healthcare providers.[22,23] These realities highlight the urgent need for strategic investment and co-ordinated national planning to expand KRT capacity and ensure equitable access for all patients.[24]

Scaling up kidney donation and transplantation

Kidney transplantation is the best treatment for end-stage kidney disease in eligible patients, offering superior survival, better quality of life and greater cost-effectiveness than dialysis.[25,26] In addition, it alleviates pressure on dialysis programmes by freeing up slots for others in need. Improving the deceased donation system holds great promise, as a single organ and tissue donor can benefit many lives. With SA's donation rate still under 1.6 pmp, strategic interventions are urgently needed.[27] These include institutional accountability for end-of-life care that routinely considers donation, supported across hospital, provincial and national levels. To ensure that this system functions effectively, standardised data monitoring, quality assurance and co-ordinated pathways, from donor identification to transplantation, are essential.

Similarly, living donor transplantation rates remain modest. According to the latest 5-year National Organ Transplant Activity Report (2017 - 2021) compiled by the SA Transplant Society, national annual living donor transplant numbers ranged between 74 and 83 in the pre-COVID years. These numbers declined significantly to just 33 in 2020 owing to the pandemic and, unfortunately, have yet to return to previous levels.[28]

The persistently low rate of living donor transplantation is likely multifactorial. Potential donors, often family or friends, may be reluctant to come forward owing to fears surrounding the donation process, or a perception that the patient is doing well on dialysis, reducing the perceived urgency. Even when a willing donor is identified, various barriers may prevent the donation from proceeding. These include a high prevalence of medical contraindications such as obesity, hypertension, diabetes and HIV among potential donors, which significantly limits donor eligibility.[29] Up to one-third of potential donors are ABO-incompatible, yet uptake for ABO incompatible transplantation has remained limited, despite its availability since 2023.[30] In the public sector, completing living donor evaluations can be a protracted process, and even once assessments are finalised, limited access to theatre time may further delay the transplant. In the private sector, the process is often slowed by delays in securing medical aid authorisations.

Primary care-level gaps and missed opportunities

At the primary care level, SA faces several interrelated challenges in addressing CKD and promoting equitable access to care. While blood tests are performed, abnormal results may go unrecognised or unaddressed. Routine CKD screening is also not consistently implemented in many primary healthcare (PHC) clinics, leading to missed opportunities for early diagnosis and intervention. In addition, long waiting times for follow-up appointments, compounded by staff shortages and high patient volumes, often result in patients being turned away or lost to follow-up, further hindering timely care.

Existing chronic disease platforms, including those for HIV, diabetes and hypertension, are inconsistently integrated with kidney risk assessment and monitoring, leading to fragmented care. Postpartum follow-up is also suboptimal, particularly for women with hypertensive disorders of pregnancy, who are often lost to follow-up despite their increased risk for CKD.[31] Furthermore, the absence of a national policy for antenatal ultrasound screening to detect congenital anomalies of the kidneys and urinary tract represents a missed opportunity to intervene early, despite growing evidence that early-life factors play a crucial role in determining long-term kidney health.[32]

Registries are important

Registries are essential for effective planning, monitoring and resource allocation in kidney care.[33] SA's national renal registry, which was established in 1977, ceased operation in 1994. It remained dormant until it was formally re-established in 2012. Since then, consistent annual reports have been published, including the last 2022 report, which marks the eleventh year of data release.[13] Despite this reinstatement, registry reporting remains incomplete in key areas, especially paediatrics and PD, and there is inadequate reporting in certain regions, limiting its utility for comprehensive service evaluation.

A roadmap for kidney care

SA urgently requires a co-ordinated national kidney health strategy, including a roadmap developed via consultation with paediatric and adult nephrologists, dialysis nurses, clinical technologists, the NDoH and key stakeholders across all nine provinces to address critical service gaps and reform kidney health services.

Our recommendations for this roadmap focus on key priority areas: integrating CKD screening and prevention into PHC; ensuring equitable access to all KRT modalities; strengthening human resources through investment in nephrology training and workforce development; and establishing clearly defined care pathways for paediatric and adolescent patients. Enhancing access to both deceased and living donor kidney transplantation is also essential. In addition, the plan calls for improved procurement systems, expanded dialysis infrastructure and the development of robust regulatory frameworks and national registry systems aligned with international best practices.

Early CKD detection and prevention are cost-effective and feasible at PHC level.[34] Nurse-led pathways, supported by standardised screening and referral protocols, can enable timely identification and management of early kidney disease. Integration of HIV care with NCD care pathways could assist in patient retention and flow.[35] Access to kidney-protective therapies, including sodium glucose transport type 2 inhibitors, must be expanded through inclusion on the Essential Medicines List. In parallel, sustained national awareness campaigns are needed to promote healthy lifestyles and improve community-level recognition of kidney disease.

A national regulatory framework for dialysis is essential to reduce cost variability, improve quality and ensure equitable access. Implementing a PD-first approach, prioritising PD before HD where possible, and supporting it with a national PD nurse training programme structured around a hub-and-spoke model would help to reduce urban-rural disparities and to lower overall service delivery costs.[36] Specific planning for adolescent patients, including designated dialysis slots, must also be incorporated into provincial service delivery plans.

Sustainable kidney care relies on strategic investment in human resources, by expanding training capacity in underserved regions, supported by the supervision and mentorship of local nephrology consultants. In areas where specialist services (such as transplantation) are limited, shared training platforms would serve as effective, collaborative solutions to bridge the gap.

Expansion of funded posts for nephrology trainees and consultants within the public sector is necessary to retain and sustain this highly skilled workforce. Strengthening service delivery also requires the creation of clearly defined entry-level roles for dialysis technicians, such as dialysis assistants and junior clinical technologists, who can provide essential operational support. In addition, greater involvement of allied health professionals, including dietitians and social workers, will be vital to delivering comprehensive, patient-centred kidney care.

Centralised, transparent procurement systems guided by clinician input will improve cost efficiency and accountability. Contracts must ensure reliable supply and servicing of dialysis equipment, including reverse osmosis water systems, consumables and maintenance support.

Planning and quality improvement efforts are limited by inadequate data systems; therefore, mandatory reporting to the National Renal Registry should be enforced, with targeted support for under-resourced units. Integration with the National Health Laboratory Service and platforms such as LabTrak would allow abnormal kidney function results to be automatically flagged, with notifications sent to clinicians and prompts for early referral generated.

Promoting early awareness of kidney health and organ donation should begin at school level, with integration into the national life orientation curriculum. Strengthening community engagement through partnerships with non-governmental organisations, traditional healers and civil society is essential to increase knowledge about kidney health, and support early detection, treatment adherence and public understanding. At the national level, governance must be reinforced through collaboration between the SA Nephrology Society, the SA Transplant Society and the NDoH to finalise and implement regulatory frameworks for dialysis and transplantation. These efforts should be further supported by international partnerships with the International Society of Nephrology, the International Pediatric Nephrology Association and the International Society for Peritoneal Dialysis to promote training, mentorship and alignment with global best practices.

To address the urgent need for improved access to kidney transplantation, the roadmap proposes a dual strategy that strengthens both deceased and living donor programmes, ensuring a more equitable and sustainable transplant system.[37] For deceased donor transplantation, the plan emphasises the development of a national, health system-based framework grounded in best clinical practices, rather than relying solely on legislative reform. Key components include the mandatory referral of potential donors using policy-defined clinical triggers, and the integration of organ donation into national end-of-life care standards. Implementation should be supported by hospital-based donation committees responsible for training, quality assurance and institutional reporting. These structural reforms must be underpinned by national guidelines, standard operating procedures and clearly defined training pathways. A robust national data system is also essential to ensure mandatory reporting, enable performance benchmarking and promote accountability across the transplant network.

Parallel efforts are needed to strengthen and expand living donor transplantation. The plan calls for comprehensive donor support, including coverage for transport, income loss and long-term follow-up, as well as community engagement through structured workshops to raise awareness among families and friends of patients on the transplant waiting list. A long-term safety net should also be established, ensuring that all donors receive free annual follow-up.

A key innovation is the introduction of a national kidney paired donation (KPD) programme. Recently approved at Groote Schuur Hospital, KPD enables incompatible donor-recipient pairs to exchange kidneys with other pairs through algorithm-based matching, improving compatibility and avoiding costly desensitisation protocols. Widely used in high-income countries, KPD increases transplant rates, improves outcomes, reduces dialysis dependence and fosters collaboration across public and private centres. With formal support from the NDoH, the Groote Schuur pilot could be scaled nationally through regulatory frameworks, dedicated funding for a national co-ordinator and logistical systems for donor or organ transport.

Conclusion

In SA, the burden of kidney disease is intensified by persistent inequities in access, workforce shortages, regulatory gaps and underinvestment in prevention. However, the inclusion of CKD in the WHO's NCDs agenda, together with SA's strong clinical leadership and proven resilience, particularly in response to the HIV epidemic, creates a pivotal opportunity for progress. Active policy engagement with the NDoH is essential to seize this moment and position SA as a regional leader in kidney health.

These recommendations provide a practical and contextually relevant roadmap to integrate kidney care into existing health system structures, strengthen prevention and broaden equitable access to dialysis and transplantation. With co-ordinated implementation, sustained political commitment and meaningful collaboration with the NDoH and key partners, SA can lead regional transformation in kidney health. By doing so, we can ensure that every individual, regardless of income, geography, or circumstance, has access to timely, high-quality and life-saving kidney care.

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