

Variations in kidney care management and access: regional assessments of the 2023 International Society of Nephrology Global Kidney Health Atlas (ISN-GKHA)



Kidney International Supplements (2024) **13**, 1–5; <https://doi.org/10.1016/j.kisu.2023.12.001>

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Worldwide, substantial evidence shows the rising incidence and prevalence of chronic kidney disease (CKD) and kidney failure requiring dialysis or transplantation.¹ Evidence also links CKD and kidney failure with excess morbidity and mortality² and immense economic challenges³ for families and countries. Nearly a billion people are estimated to be living with kidney disease worldwide.⁴ CKD, which ranks 12th among global causes of death, accounted for 1.43 million deaths in 2019, a 137% increase from 1990.² With the rising prevalence of CKD and kidney failure, the cost of coverage for kidney replacement therapy (KRT; including dialysis and kidney transplantation) continues its astronomical rise for health systems, individuals, and families. For instance, although all kidney failure patients accounted for <1% of the Medicare population in the US, they represented >6% of Medicare payments in 2020.⁵ Estimates of the cost of reimbursement for hemodialysis treatment for people with kidney failure in sub-Saharan Africa showed that the total costs would be equivalent to 15%–55% of total domestic governmental health expenditure in 2010.³ Global differences in availability, accessibility, and affordability of KRT across countries have been reported,⁶ and where these are lacking, this leads to poor patient outcomes.^{7–9}

The International Society of Nephrology Global Kidney Health Atlas (ISN-GKHA) initiative is a multinational project that assesses the global status of and individual country readiness and capacity to deliver kidney care.¹⁰ The ISN-GKHA assesses capacity using the universal healthcare framework, across 6 health systems domains: financing, service delivery, access to essential medicines, workforce, health information systems, and governance. Extensive interregional and intraregional variability was demonstrated from the last iteration of this project.¹¹

In previous iterations of the ISN-GKHA, responses were received from 124 nations (2017) and 160 nations (2019) and described availability of testing facilities, workforce, and modalities of KRT (Figure 1). This third edition of the ISN-GKHA, which involved more countries (n = 167), sought to extend the findings from previous iterations to define the current status of care, and global capacity to deliver optimal care across the disease spectrum to all people living with CKD. The survey assessed country capability to provide optimal kidney care, including availability, accessibility, quality, and affordability of medicines, KRT, and conservative kidney management, thus complementing existing data on the global burden of CKD. The survey captures information about access to care for all stages of CKD and includes a section on causes of hospitalization and death among people on dialysis. With such extensive participation of countries around the globe, the extent of gaps in availability and access to kidney care is being highlighted, underscoring the importance of the ISN-GKHA data as a useful tool for engaging with governments and policymakers. The hope is that this robust and rigorous documentation, which is available to all, may increase awareness and thus ultimately lead to improvements in kidney care across nations where the gaps are greatest.¹²

In this issue of *Kidney International Supplements*, we present country-specific data, summarized to reflect kidney-care capacity across the 10 ISN regions. We highlight features of participating countries, disease burden, health financing and service delivery, workforce capacity, access to essential medicines, causes of hospitalization and death, features of health information systems, and available policies and advocacy structures in each region.

We have developed 10 manuscripts, one for each of the regions,^{13–22} with a broad overview

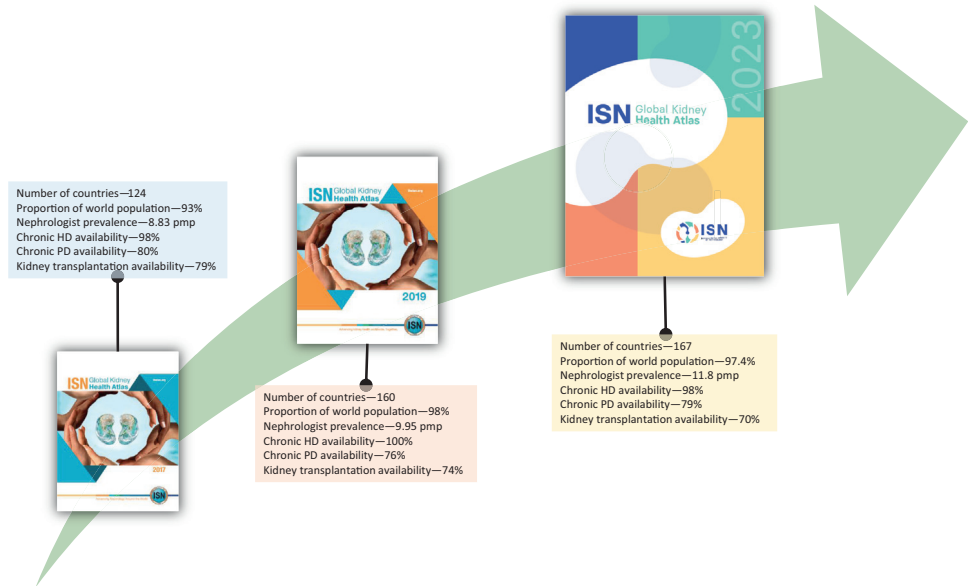


Figure 1 | Overview of key findings across all 3 International Society of Nephrology Global Kidney Health Atlas (ISN-GKHA) iterations. The data are presented as counts and percentages of countries that participated or rate per million population (pmp). HD, hemodialysis; PD, peritoneal dialysis.

of key findings of the current ISN-GKHA iteration, and we highlight differences in regional availability of KRT modalities, and the relationship between regional gross domestic product and availability of KRT services. The introduction²³ describes the methodological approaches used to obtain country-level data for both the literature review and survey sections of the project. Highlights from individual regions are presented below.

Africa

Tannor *et al.*¹³ reported that Africa had 1.4 billion people; 41 countries (of 54) participated in the survey; and the annual total health spending per capita was the lowest across all regions, at \$54 (all \$ amounts are given in US\$). All participating countries had hemodialysis (HD), whereas only 48% and 33% had peritoneal dialysis (PD) and kidney transplantation, respectively. The median annual cost of HD per person was \$13,793, and only 10 countries (24%) covered the cost of dialysis through public funds. The median prevalence of nephrologists in Africa was 1.1 per million population (pmp). They suggested that strategies need to be implemented to ensure improved kidney care that focuses more on early disease detection and prevention, improving the effectiveness of the available healthcare workforce, and augmenting kidney-care financing.

Eastern and Central Europe

In the Eastern and Central Europe region, with approximately 207.3 million people, 16 countries (of 20) participated in the survey. Alparslan *et al.*¹⁴ reported the region’s total health spending to be \$1012 per capita, with all modalities of KRT being available in all countries of the region. The median annual cost of HD per person was \$19,028, and in 11 countries (69%), public funds (free at delivery) were available for the reimbursement of the cost of HD. This region had the third-highest prevalence of nephrologists (28.4 pmp) and reported both variable prevalence of nephrology trainees and health workforce shortages. The authors suggested that organizational and legislative planning and partnership with national authorities and societies may accelerate the improvement of kidney healthcare in the region.

Latin America

Calice-Silva *et al.*¹⁵ reported that the Latin America region had a population of 659.3 million people; 22 countries (of 33) participated in the survey; and annual total health spending per capita was \$431. All participating countries had HD, whereas PD and kidney transplantation services were available in 91% and 86% of countries, respectively. PD was the predominant modality in Mexico and Costa Rica. The median annual cost of HD per

person was \$17,240, and only 6 countries (27%) covered the cost of HD through public funds. The median prevalence of nephrologists was 12.5 pmp, with shortages of various healthcare providers reported. Collaboration within the kidney community and maintenance of regional and international partnerships were reported as measures that would help enable the Latin America region to achieve universal and value-based kidney care.

Middle East

Ongoing conflicts, profound economic crises, and recent natural and human-made disasters in countries of the Middle East were noted by Karam *et al.*,¹⁶ who linked these factors to the delivery of kidney care in the region. The ISN Middle East region has a population of 255.2 million people; 11 countries (of 13) participated in the survey; and annual total health spending per capita was \$593. All participating countries had all KRT modalities. The median annual cost of HD per person was \$26,226, and public funding (free at delivery) was available in 8 countries (73%). The prevalence of nephrologists was 15.9 pmp. Guideline-tailored preventive and early disease-identification strategies, along with improved resource allocation, were suggested as factors that require more attention to improve outcomes of people receiving kidney care in the region.

Newly Independent States and Russia

For the Newly Independent States and Russia region, Prikhodina *et al.*¹⁷ reported that the region had 278.9 million people; 10 countries (of 11) participated in the survey; and annual total health spending per capita was \$272. All countries in the region had HD and kidney transplantation services, but PD was available in only 70% of countries. The median annual cost of HD per person was \$8457, and only 5 countries (50%) covered the cost of dialysis through public funds. The median prevalence of nephrologists in the Newly Independent States and Russia region was 9.8 pmp, with variable shortages of various caregivers reported. Although resource limitations were identified as an obvious barrier to the delivery of optimal kidney care, a focus on disease prevention, early identification, and improved public funding to cover the cost of treatment was suggested as a means to improve individual health outcomes in the region.

North America and the Caribbean

Lowe-Jones *et al.*¹⁸ reported that the North America and the Caribbean region had 381 million people; 12 countries (of 14) participated in the survey; and annual total health spending per capita was \$1027, which was the third-highest level across all regions. Although in-center HD was available in all countries in the region, PD and kidney transplantation services were available in 83% and 50% of countries, respectively. The median annual cost of HD per person was \$39,826, and only 4 countries (33%) covered the cost of dialysis through public funds that were free at the point of delivery. The median prevalence of nephrologists in the North America and the Caribbean region was 18.8 pmp, with variable shortages of various caregivers reported, especially across the Caribbean nations. Significant heterogeneity was identified in the region, especially among the Caribbean countries, in terms of dialysis and personnel capacity. Suggested steps to improve kidney care in the region include a focus on preventive care, home-based KRT and kidney transplantation, and improvement in the training and retention of the workforce.

North and East Asia

Fung *et al.*¹⁹ reported that the North and East Asia region had 1.62 billion people; 6 countries (of 8) participated in the survey; and the annual total health spending per capita was \$1449. All participating countries had all KRT modalities. The median annual cost of HD per person was \$20,172, and only one country (17%) used public funding (free at the point of delivery) to reimburse for HD cost. This region recorded the highest prevalence of nephrologists (28.7 pmp). The authors suggested that these data are useful for addressing intraregional gaps in kidney care and stressed the need for increased use of multidisciplinary teams and telemedicine to promote prevention and treatment of kidney failure, and increased advocacy related to kidney disease in the region.

Oceania and South East Asia

In the Oceania and South East Asia (OSEA) region, Francis *et al.*²⁰ reported that the region had 720 million people; 19 countries (of 30) participated in the survey; and annual total health spending per capita was \$231. In-center HD was available in 89% of countries in the region, and PD and kidney transplantation

were available in 72% and 61% of countries, respectively. The median annual cost of HD per person was \$10,086, and only 3 countries (17%) covered the cost of dialysis through public funds. Variable shortages were reported in various types of kidney caregivers, and the median prevalence of nephrologists in the OSEA region was reported to be 3.2 pmp. The authors noted inequalities in access to KRT across the OSEA region and suggested leveraging extensive collaborative work, within the region and globally, to close gaps in kidney-care provision.

South Asia

Wijewickrama *et al.*²¹ reported that the South Asia region had 1.9 billion people; all countries in the region (n = 8; 100%) responded to the survey; and annual total health spending per capita was the second lowest at \$56. In-center HD was available in 7 countries (88%), and PD and kidney transplantation were available in 75% and 63%, respectively. The median annual cost of HD per person was the lowest across all regions, at \$4310, and only 3 countries (38%) in the region covered the cost of dialysis through public funds. The median prevalence of nephrologists was 1.8 pmp, with shortages of various healthcare providers reported. Low healthcare expenditure, shortages within the health workforce (especially of nephrologists), and suboptimal infrastructure were identified as important barriers to optimal delivery of kidney care in the region.

Western Europe

For the ISN Western Europe region, Pippias *et al.*²² reported that the region had a population of 439.5 million people; 22 countries (of 29) participated in the survey; and annual total health spending per capita was the highest across all regions, at \$5088. In-center HD and PD were available in all countries, and kidney transplantation was available in 86% of countries in the region. The median annual cost of HD per person was highest in comparison to that in other regions, at \$65,841, and the region had the largest number of countries (n = 19; 86%) in which HD was covered using public funds. The median prevalence of nephrologists was second highest, at 25.0 pmp, with fewer shortages reported across healthcare provider types. The authors noted that although Western Europe exhibited strong kidney-care infrastructure, opportunities for improvement exist,

particularly in CKD prevention, surveillance, awareness, and policy implementation.

The 10 articles provide detailed snapshots of the current status of the organization, structure, and funding of kidney care within each region, and they highlight region-specific challenges to optimal care delivery. Collectively, and per the individual reports, the data provide value in establishing the current state, enabling comparisons across countries using the same framework, and informing advocacy strategies within specific countries. Identifying gaps, and then developing plans to address them, including the implementation of services essential for diagnosis and prevention, will certainly aid in improving access to care. The totality of the information in the ISN-GKHA serves as a unique resource by which to understand the current state of kidney care and follow its progress and changes over time.

FUNDING SOURCE

This article is published as part of a supplement sponsored by the International Society of Nephrology with grant funding to the University of Alberta (RES0033080).

ROLE OF THE FUNDER/SPONSOR

The International Society of Nephrology provided administrative support for the design and implementation of the survey and data collection activities. The authors were responsible for data management, analysis, and interpretation, as well as manuscript preparation, review, and approval, and the decision to submit the manuscript for publication.

DISCLOSURES

AKB reports other (consultancy and honoraria) from AMGEN Incorporated and Otsuka; other (consultancy) from Bayer and GSK; and grants from the Canadian Institute of Health Research and the Heart and Stroke Foundation of Canada, outside the submitted work; and being Associate Editor of the *Canadian Journal of Kidney Health and Disease* and Co-chair of the International Society of Nephrology –Global Kidney Health Atlas. DWJ reports grants and personal fees (consultancy, honoraria) from Baxter Healthcare and Fresenius Medical Care; other (travel sponsorship) from Amgen; personal fees (consultancy) from Astra Zeneca, AWAK and Bayer; grants from National Health and Medical Research Council of Australia; and personal fees (honoraria) from Ono and Lilly, outside the submitted work. All the other authors declared no competing interests.

ACKNOWLEDGMENTS

The authors appreciate the support from the International Society of Nephrology's (ISN's)

Executive Committee, regional leadership, and Affiliated Society leaders at the regional and country levels for their help with the ISN–Global Kidney Health Atlas.

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