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Capacity for the management of kidney failure in the International Society of Nephrology South Asia region: report from the 2023 ISN Global Kidney Health Atlas (ISN-GKHA)

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The South Asia region is facing a high burden of chronic kidney disease (CKD) with limited health resources and low expenditure on health care. In addition to the burden of CKD and kidney failure from traditional risk factors, CKD of unknown etiologies from India and Sri Lanka compounds the challenges of optimal management of CKD in the region. From the third edition of the International Society of Nephrology Global Kidney Health Atlas (ISN-GKHA), we present the status of CKD burden, infrastructure, funding, resources, and health care personnel using the World Health Organization's building blocks for health systems in the ISN South Asia region. The poor status of the public health care system and low health care expenditure resulted in high out-of-pocket expenditures for people with kidney disease, which further compounded the situation. There is insufficient country capacity across the region to provide kidney replacement therapies to cover the burden. The infrastructure was also not uniformly distributed among the countries in the region. There were no chronic hemodialysis centers in Afghanistan, and peritoneal dialysis services were only available in Bangladesh, India, Nepal, Pakistan, and Sri Lanka. Kidney transplantation was not available in Afghanistan, Bhutan, and Maldives. Conservative kidney management was reported as available in 63% (n = 5) of the countries, yet no country reported availability of the core CKM care components.

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There was a high hospitalization rate and early mortality because of inadequate kidney care. The lack of national registries and actual disease burden estimates reported in the region prevent policymakers' attention to CKD as an important cause of morbidity and mortality. Data from the 2023 ISN-GKHA, although with some limitations, may be used for advocacy and improving CKD care in the region.

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South Asia is the habitat of 1.9 billion people and 25% of the world's population.[1] Like other parts of the world, with globalization, urbanization, lifestyle changes, and improvements in sanitation and hygiene, the cause of death and disability also transitioned from communicable and nutritional diseases to noncommunicable diseases (NCDs) in South Asia.[2] The World Health Organization Global Health Observatory 2019 revealed NCD accounts for 74% of all deaths globally.[3] The 2019 Global Burden of Disease study modeled the estimate of disability-adjusted life-years (DALYs) for chronic kidney disease (CKD) and documented a rise from 29th position in 1990 to 18th in 2019, with a percentage increase in the number of DALYs of 93.2% for CKD.[4] CKD is projected to be the fifth most common cause of years of life lost worldwide by 2040.[5] In 2019, there were 3.16 million deaths and 76.5 million DALYs attributable to kidney dysfunction worldwide, which increased by 101.1% and 81.7% compared with that in 1990, respectively.[6] There was a large decline in age-standardized DALY rates for ischemic heart disease, stroke, chronic obstructive airway disease, cirrhosis, and road injuries; however, DALY rates for diabetes and CKD were increased.[4] The burden of CKD is increasing faster in low-income countries and low-middle–income countries (LMICs).[7,8] Although cardiovascular disease, stroke, and cancer have drawn the attention of stakeholders, CKD remains a lower priority, particularly in LMICs.

The 2 most important risk factors for CKD, diabetes and hypertension, are on an increasing trend in the region.[9,10] Changing climates, increasing environmental pollution, frequent natural disasters such as earthquakes and floods, and frequent use of traditional medicines compound the existing CKD burden.[11,12] Recently, the coronavirus disease 2019 pandemic also affected the care of CKD and other NCDs; however, its impact on the CKD burden remains to be assessed.[13,14] Low expenditures on health care relative to gross domestic product (GDP) in the region, weak health systems, inadequate preparedness and response capabilities, deficient quality of care, and poor data systems affect the care of CKD in the region.[15] Most resources are consumed on the care of infectious diseases and other issues requiring immediate attention, such as maternal and newborn care.[16,17] Despite the World Health Organization's focus on reducing death due to NCD and the policies laid down for NCD,[2,3] CKD has failed to draw the attention of governments and policymakers in the region because of a lack of national registries and other organized data collection initiatives.[18]

The International Society of Nephrology Global Kidney Health Atlas (ISN-GKHA) was conducted to update the status of kidney care globally. A previous report from the 2019 ISN-GKHA reported on the availability of structures for kidney care in the ISN South Asia region.[19] This paper reports the status of available kidney care in the ISN South Asia region from the 2023 ISN-GKHA. The methods for this research are described in detail elsewhere.[20]

Results

The results of this study are presented in Tables and Figures and broadly summarized into 2 categories: desk research (Table 1,[21–29] Table 2,[30–33] and Supplementary Table S1[34,35]) and survey administration (Figures 1–4, Supplementary Table S1, Supplementary Tables S2A–S2H, and Supplementary Figure S1).

Study setting. Approximately one-fourth (1.9 billion) of the world's population, distributed across just 3% of the global land area, lives in the ISN South Asia region (Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka; Figure 1). Most countries in the South Asia region are LMICs and have low health care spending; approximately 65% of the population live in rural areas.[21,36] The World Bank categorizes Afghanistan as a low-income country; Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka as LMICs; and the Maldives as an upper-middle–income country.[37] This region ranks second in global poverty, with immense income inequalities reflected by Gini index values ranging from 29.3 to 37.7.[38] All countries, except Bhutan and Afghanistan, are among the 20th most densely populated globally. There is huge diversity in the culture, language, and dietary habits of the people residing in the region. The economies in all South Asian countries are primarily agrarian, with one-half to three-quarters of the population living in rural areas.

Current state of kidney care in the region. Health care for people with kidney disease in South Asia exhibits significant inadequacies, encompassing insufficient funding, a dearth of data, disparities in resource allocation, unaffordability, and limited access to kidney replacement therapies (KRTs; hemodialysis [HD], peritoneal dialysis [PD], and kidney transplant [KT]). The ISN South Asia region reportedly demonstrates the lowest CKD prevalence among all regions except Africa. However, this is likely due to inadequate reporting and a lack of robust data collection mechanisms. The region grapples with a shortage of physicians, medical doctors, and nurses capable of providing kidney care. Even though the cost of in-center HD and PD is the most affordable in the world for this region, it paradoxically exhibits the lowest treated kidney failure (KF) prevalence. This underscores the dire lack of availability, affordability, and

Table 1 | Demographics, economic and health indicators, and annual cost of KRT in the ISN South Asia region[21–29]

Country	Population (millions)	Total GDP (PPP) ($ billion)[a]	Per capita GDP ($)[a]	Health care expenditures (% GDP)	Total health spending per person[a]	Government health spending per person[a]	Out-of-pocket health spending per person[a]	HD	PD	KT (first year)	HD/PD cost ratio
South Asia Median [IQR]	34.5 [12.0–204.3]	226.1 [38.3–1214.9]	6985 [4796–12,188]	3.8 [3.2–7.9]	56 [47–106]	13 [8–61]	35 [22–45]	4310 [3538–11,932]	5531 [3970–6498]	4143	0.83 [0.68–2.08]
Afghanistan	38.3	66.8	1744	13.2	50	3	39	—	—	—	—
Bangladesh	165.7	1099.8	6637	2.5	47	8	35	4310	5531	4143	0.78
Bhutan	0.9	9.3	10,333	3.6	106	82	16	—	—	—	—
India	1390	10,193.6	7333	3	76	23	45	18,659	6507	—	2.87
Maldives	0.4	9.8	24,500	11.4	—	—	—	—	—	—	—
Nepal	30.7	126.4	4117	4.5	56	13	31	3254	3904	3969	0.83
Pakistan	242.9	1330.1	5476	3.4	42	13	22	5206	4035	6464	1.29
Sri Lanka	23.2	325.8	14,043	4.1	148	61	75	3821	6490	—	0.59

—, data not reported or unavailable; GDP, gross domestic product; HD, hemodialysis; IQR, interquartile range; ISN, International Society of Nephrology; KRT, kidney replacement therapy; KT, kidney transplantation; PPP, purchasing power parity; PD, peritoneal dialysis.
[a]$US.

accessibility to KRT in South Asia. Kidney transplantation remains limited to only a handful of countries within the region, primarily reliant on living donor transplantation. There is a glaring absence of organized systems to use deceased organs for transplantation, resulting in a gross underutilization of deceased donor transplantation for individuals experiencing KF.

Literature review data for countries in the ISN South Asia region

Burden of CKD and kidney failure. The median prevalence of CKD was 6.5 (interquartile range [IQR] 5.9–8.5) with the lowest prevalence of 4.5% (95% confidence interval [CI], 4.2–4.8) in Afghanistan and the highest in Sri Lanka at 13.5% (95% CI, 12.5–14.4; Supplementary Table S1).[34] CKD prevalence, the prevalence of risk factors (obesity, increased blood pressure, and smoking), morbidity, and mortality attributed to CKD in each country are presented in Supplementary Table S1.[34,35] The median DALYs attributed to CKD were estimated to be 573.5 (IQR 540.7–765.2) per 100,000 population. The median estimated percentage of deaths attributed to CKD was 2.6 (IQR 2.2–3.5). Sri Lanka had the highest mortality and DALYs due to CKD followed by Bhutan. Table 1[34] presents data regarding important socioeconomic and health indicators of the ISN South Asia region.

Data on the prevalence of total KF were available only for Bangladesh (116 per million population [pmp]; Table 2).[30–33] The prevalence of people treated with dialysis (HD and PD) was highest for Bangladesh (112 pmp) followed by Pakistan (53.3 pmp), India (49.2 pmp), and Nepal (11.6 pmp). Similarly, the prevalence of people treated with HD was highest in Bangladesh (107.9 pmp) followed by Pakistan (34.3 pmp), India (18.0 pmp), and Nepal (10.1 pmp; Table 2).[30–32] Sri Lanka had the highest incidence of kidney transplants (14.4 pmp; Table 2).[33] Most KT was from living donors, with the highest incidence in Sri Lanka (9.8 pmp) followed by India (3.6 pmp), Nepal (3.5 pmp), Bangladesh (1.4 pmp), and Pakistan (0.58 pmp; Table 2).[33] Deceased donor transplants occurred in Sri Lanka (4.6 pmp) and India (0.37 pmp; Table 2).[33] The availability of kidney care services for the region is shown in Figure 2. Apart from Afghanistan, all countries had access to KRT. Conservative kidney management (CKM) was most readily available in the Maldives.

Overview of GDP and government health expenditure by individual countries. India had the largest economy in the region, contributing to nearly 80% of the ISN South Asia region's GDP (Table 1).[21] However, India stands fourth in terms of regional per capita GDP rankings (behind Maldives, Sri Lanka, and Bhutan), whereas Afghanistan has the lowest per capita GDP. The region, allocating a median of 3.8% of GDP to health care expenditure, maintains 1 of the lowest health care spending rates globally (Table 1).[21,22] Afghanistan and Maldives had relatively high health care expenditures of 13.2% and 11.4% of GDP, respectively, whereas all other nations in the region allocate less than 4.5% of GDP to health care. Bhutan led in government health spending, contributing

Table 2 | Incidence, prevalence, and availability of KRT in the ISN South Asia region[30–33]

Country	Incidence of treated KF (pmp)	Prevalence of treated KF (pmp)	Prevalence of chronic dialysis (pmp)	Prevalence of chronic HD (pmp)	Prevalence of chronic PD (pmp)	KT prevalence (pmp)	KT incidence (pmp)	Deceased donor KT incidence (pmp)	Living donor KT incidence (pmp)	Prevalence of HD centers (pmp)[a]	Prevalence of PD centers (pmp)[a]	Prevalence of KT centers (pmp)[a]
Global, median [IQR]	145.5 [107.0–212.5]	822.8 [556.0–1114.0]	396.6 [105.7–687.0]	322.7 [76.3–648.8]	21.0 [1.5–62.4]	279.0 [58.0–492.0]	12.2 [3.0–27.8]	3.2 [0.0–20.8]	3.4 [1.2–8.6]	5.1 [1.6–11.1]	1.6 [0.45–3.1]	0.46 [0.23–0.75]
South Asia, median [IQR]	64 [64.0–64.0]	116 [116.0-116.0]	51.3 [30.4–82.7]	26.1 [14.1–71.1]	1.9 [0.6–5.8]	6.0 [6.0–6.0]	3.5 [1.4–4.0]	0.0 [0.0–0.4]	3.5 [1.4–3.6]	2.3 [1.4–8.1]	0.14 [0.08–0.22]	0.11 [0.08–0.26]
Afghanistan	—	—	—	—	—	—	—	—	—	—	—	—
Bangladesh	64.00	116.00	112.00	107.88	2.32	6.00	1.37	0.00	1.37	1.39	0.06	0.03
Bhutan	—	—	—	—	—	—	—	—	—	8.07	—	—
India	—	—	49.20	18.00	5.80	—	3.98	0.37	3.60	0.36	0.14	0.11
Maldives	—	—	—	—	14.40	—	—	—	—	35.88	—	—
Nepal	—	—	11.60	10.10	1.50	—	3.51	0.00	3.51	2.28	0.33	0.26
Pakistan	—	—	53.30	34.30	0.20	—	0.58	0.00	0.58	1.65	0.08	0.08
Sri Lanka	—	—	—	—	0.60	—	14.39	4.58	9.81	2.76	0.22	0.60

—, data not reported or unavailable; HD, hemodialysis; IQR, interquartile range; KF, kidney failure; KT, kidney transplantation; PD, peritoneal dialysis; pmp, per million population.
[a]Survey response data.

approximately 80% of the total health expenditure per person. Conversely, Afghanistan exhibited the lowest government health spending in the region, where nearly 70% of health care expenses per person were borne out of pocket.[22]

Cost of KRT in South Asia

Data on the annual cost of KRT were available for 5 of the 8 countries in the region (Table 1).[23–29] The annual cost of HD was highest in India (US $18,659), nearly 3 times more than the country's local annual cost of PD. The annual cost of PD was higher than HD in all countries except India and Pakistan. The median annual cost ratio of HD (US $4,310) to PD (US $5,531) in the region was 0.83 (IQR 0.68–2.1). Bangladesh, Nepal, and Pakistan data on the cost of KT in the first year were higher than that of HD.

Survey response data for the ISN South Asia region

Characteristics of participating countries. All 8 countries of the ISN South Asia region participated in the survey. The respondents were predominantly nephrologists (n = 12, 71%) followed by non-nephrology physicians (n = 2, 12%) and administrators/policymakers (n = 1, 6%).

Health finance and service delivery. Expenditures for nondialysis CKD care were covered entirely by public funds in Bhutan and Maldives. India and Sri Lanka had a mix of public and private funding systems, whereas multiple funding systems were in place in Bangladesh, Nepal, and Pakistan. In Afghanistan, treatment was provided solely in private hospitals, with people living with KF paying for all costs. Funding for KRT was covered entirely by public funds in Bhutan and Maldives. Funding for KRT in India, Pakistan, and Bangladesh was based on a mix of public and private funding mechanisms and out-of-pocket expenditures. Sri Lanka also had a mix of public and private funding mechanisms and out-of-pocket expenditure for KRT except for PD, which was covered entirely by public funds. Nepal had a public funding mechanism with some fees for HD and KT, with solely private out-of-pocket spending for PD (Figures 2 and 3).

Health workforce for nephrology care. A wide range of health care providers (e.g., nephrologists, primary care physicians, surgeons, nurses, and multidisciplinary teams) were involved in kidney care in the region. Nephrologists were primarily responsible for the medical care of people with KF in all countries except for Afghanistan and Bhutan, where primary care physicians primarily provided the care. The median number of nephrologists pmp was 1.8 (IQR 1.4–2.0). Afghanistan had the fewest nephrologists relative to the population (0.03 pmp), whereas Maldives had the highest (10.3 pmp; Figure 2). All countries in the region had nephrology training programs except for Afghanistan, Bhutan, and Maldives (Figure 2).

Supplementary Figure S1 presents reported workforce shortages for medical KF care relative to needs in the region. Overall, there were shortages in all types of medical KF care providers, including nephrologists (n = 6, 75%), transplant surgeons (n = 6, 75%), HD/PD access surgeons (n = 6, 75%),

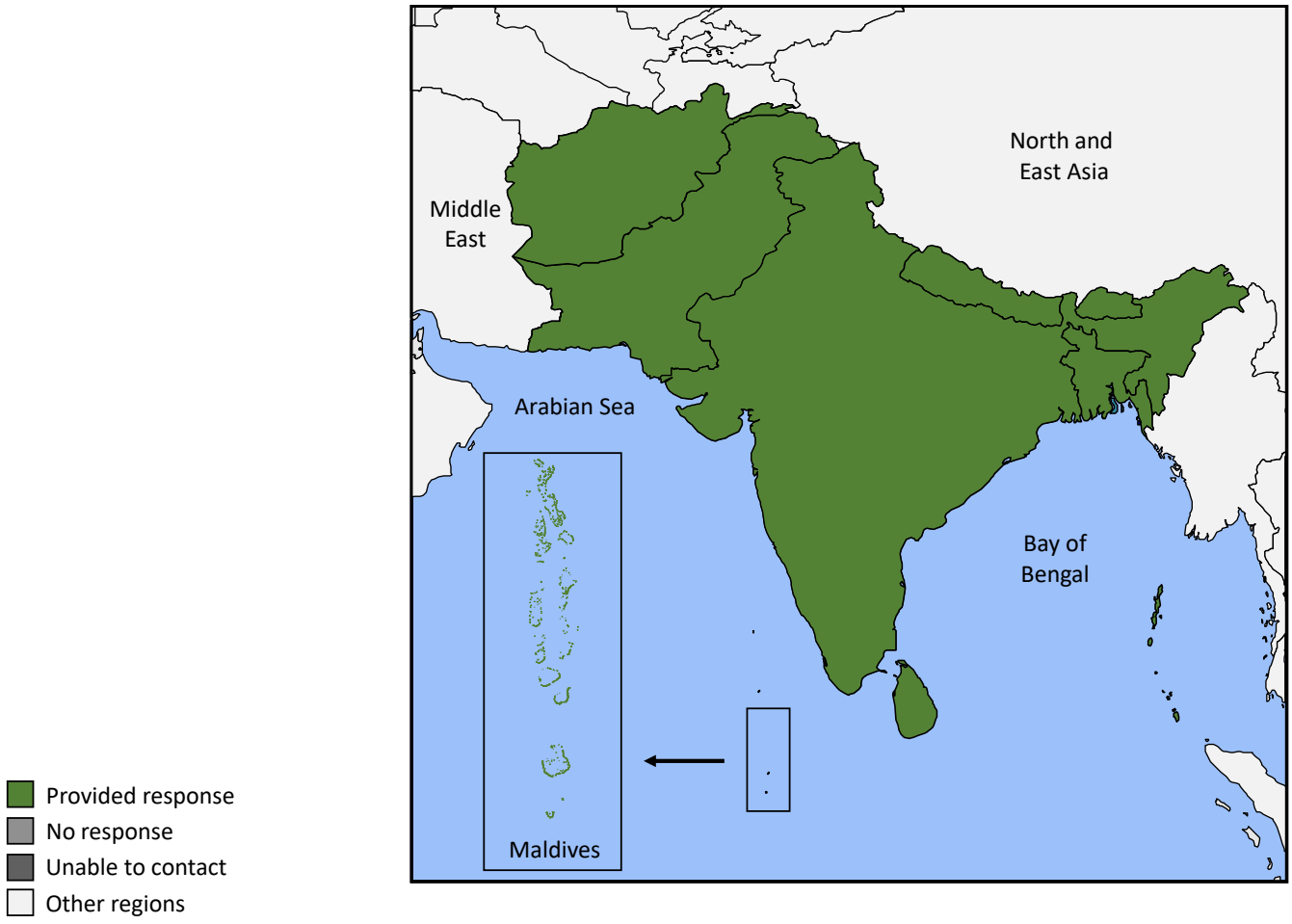

Figure 1 | Countries in the International Society of Nephrology South Asia region.

radiologists (n = 4, 50%), laboratory technicians (n = 4, 50%), dietitians (n = 5, 63%), vascular access coordinators (n = 7, 88%), counselors/psychologists (n = 6, 75%), transplant coordinators (n = 7, 88%), dialysis and kidney nurses (n = 6, 75%), and dialysis technicians (n = 6, 75%). India reported no shortages of KF care providers across all disciplines. The other countries in the region reported variable shortages in KF care providers. Severe shortages were reported in pediatric nephrologists, vascular access coordinators, and transplant coordinators (except in India) and in nephrologists, transplant surgeons, HD/PD access surgeons/interventional radiologists, dialysis nurses, kidney nurses and dialysis technicians (except in India and Nepal). Shortages were reported in social workers and kidney supportive care nurses in all countries except Bhutan and India. A shortage of counselors/ psychologists was reported in all countries except Maldives and India.

Capacity for KRT service provision. Chronic HD was available in all countries in the ISN South Asia region except Afghanistan (Figure 2). HD (3 times per week for 3–4 hours each) was generally available in only 63% (n = 5) of the countries. PD was also available in all countries except Afghanistan and Maldives. PD exchanges of adequate frequency (3-4 per day or equivalent cycles on automated PD) were generally available in only 50% (n = 4) of countries. Measures to determine the effectiveness of PD (urea reduction ratio and/or Kt/V [measure of dialysis adequacy]) were generally available in 50% (n = 4) of countries. KT was not available in Afghanistan, Bhutan, and Maldives. Early provision of culturally appropriate information to patients, relatives, and caregivers about the risks and benefits of transplantation with a clear explanation of tests, procedures, and results; effective preventive therapy to control infections; and appropriate facilities to monitor administration of immunosuppression drugs were available in 75% (n = 6) of the countries. Timely access to operating space for KT, standard frameworks for organ procurement, multidisciplinary teams to support patients with a KT, and access to appropriate immunosuppression and antirejection treatment were available in 63% (n = 5) of the countries. Some form of CKM was available in all countries except Afghanistan and Pakistan; data were unavailable for Bhutan. Despite reporting general availability of CKM, South Asia was the only ISN region globally where no country reported availability of the system features required to deliver CKM. This included shared decision-making tools about CKM; an infrastructure to

Country		Availability of KRT			Availability of CKM		Funding for medications			Availability of distribution of registry				Advocacy group			Nephrology workforce (PMP)	
		HD	PD	Kidney transplantation	Shared decision	Choice-restricted (limited)	CKD	Dialysis	Kidney transplantation	CKD	Dialysis	Kidney transplantation	AKI	CKD	AKI	KF/KRT	Nephrologists	Nephrologist trainees
Afghanistan	2019																0.14	
	2023																0.03	0.00
Bangladesh	2019																0.88	0.25
	2023																1.83	0.54
Bhutan	2019																1.30	0.00
	2023																1.15	0.00
India	2019																1.39	0.15
	2023																1.80	0.22
Maldives	2019																	
	2023																10.25	0.00
Nepal	2019																1.68	0.34
	2023																2.15	0.33
Pakistan	2019																0.63	1.14
	2023																1.73	1.65
Sri Lanka	2019																1.15	0.62
	2023																1.94	1.04

Yes
No
N/A

Nephrologist prevalence	<1.8 PMP	1.8–11.7 PMP	11.8–24.7 PMP	≥24.8 PMP
Nephrology trainees prevalence	<0.2 PMP	0.2–1.1 PMP	1.2–3.7 PMP	≥3.8 PMP

Figure 2| Country-level scorecard of availability of kidney care services, funding, registries, advocacy groups, and workforce in the International Society of Nephrology South Asia region. Funding for medications refers to 100% publicly funded by the government (free at the point of delivery). AKI, acute kidney injury; CKD, chronic kidney disease; CKM, conservative kidney management; HD, hemodialysis; KF, kidney failure; KRT, kidney replacement therapy; N/A, not available; PD, peritoneal dialysis; PMP, per million population.

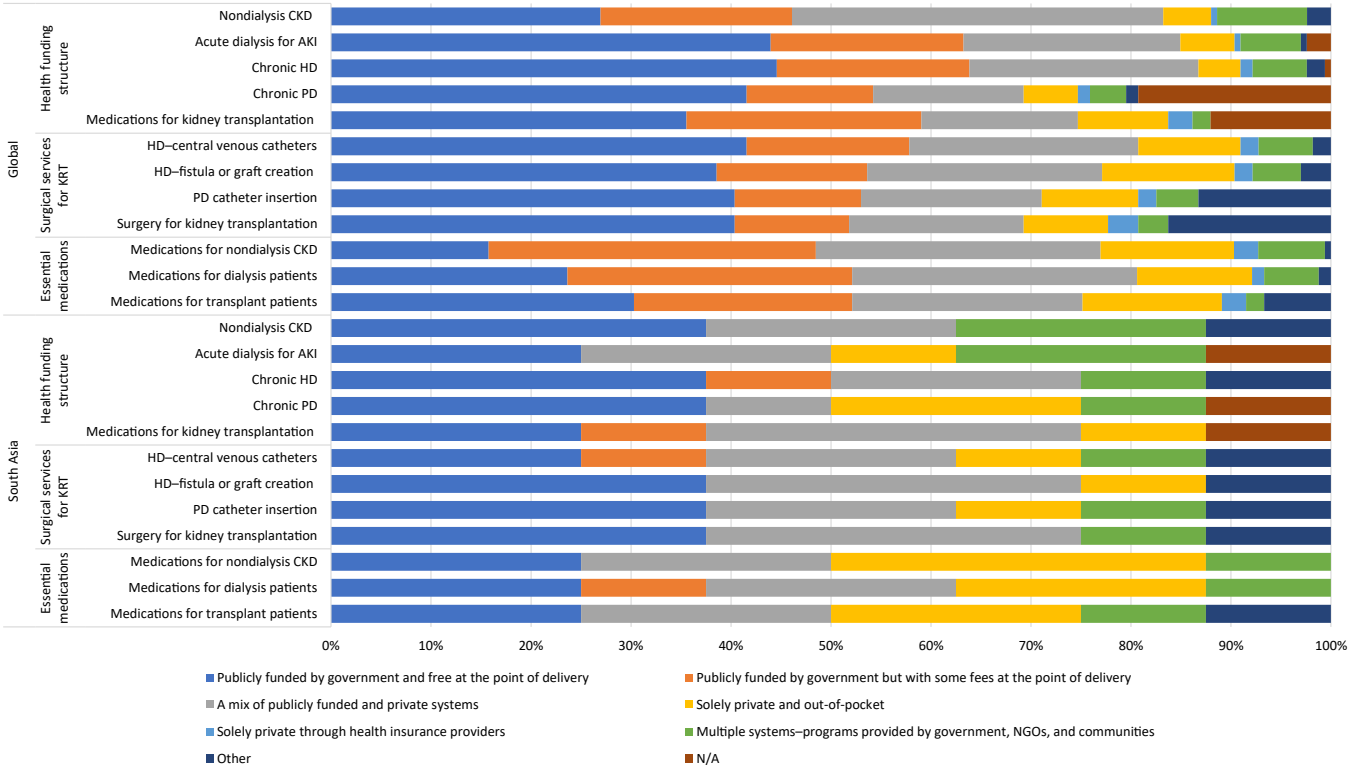

Figure 3| Funding structures for nondialysis chronic kidney disease (CKD) and kidney replacement therapy (KR) care globally and in the International Society of Nephrology South Asia region. Values represent the absolute number of countries in each category expressed as a percentage of total number of countries. AKI, acute kidney injury; HD, hemodialysis; N/A, not provided; NGOs, non-governmental organizations; PD, peritoneal dialysis.

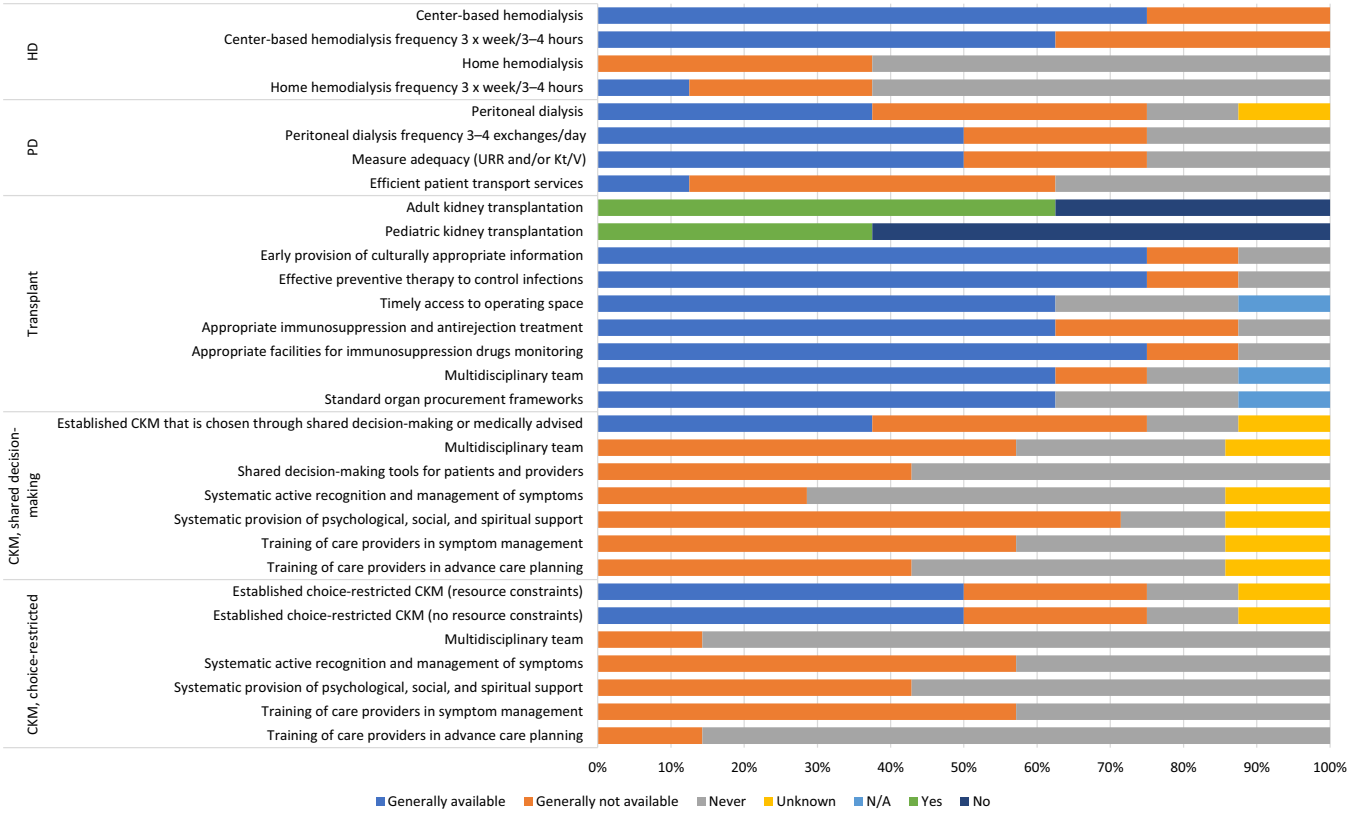

Figure 4 | Availability of services within dialysis care and conservative kidney management (CKM) in the International Society of Nephrology South Asia region. Values represent the absolute number of countries in each category expressed as a percentage of total number of countries. HD, hemodialysis; Kt/V, measure of dialysis adequacy; N/A, not provided; PD, peritoneal dialysis; URR, urea reduction ratio.

document and share advance care planning conversations including decisions around preferred place of care and death and resuscitation; provision of psychological, social, and spiritual support; availability of a written CKM pathway, blueprint, or guidelines; regular use of validated screening tools, documentation, and management of symptoms; or formal links between the multidisciplinary team and clinicians with training in CKM or palliative care services. Overall, respondents from only 1 (13%) country indicated that, on average, nephrologists were likely to "always or often" offer CKM as a treatment option in CKD stage G5. This was the lowest prevalence for all ISN regions globally. Capacity for KRT in the region is presented in Table 2. A comparison of the availability and quality of services within dialysis care and CKM is shown in Figure 4.

The median prevalence of chronic HD treatment centers in the region was 2.3 pmp (IQR 1.4–8.1 pmp; Table 2), with the highest prevalence in Maldives (35.9 pmp) and the lowest in India (0.36 pmp). There were no chronic HD centers in Afghanistan. Services for PD care were generally available in Bangladesh, India, Nepal, Pakistan, and Sri Lanka. The median prevalence of PD treatment centers in the region was 0.14 pmp, with the highest prevalence of chronic PD centers pmp in Nepal (0.33 pmp) and the lowest in Bangladesh (0.06 pmp; Table 2). KT was available in all countries except Afghanistan, Bhutan, and Maldives. The median prevalence of KT centers in the region was 0.11 pmp; the highest in Sri Lanka (0.6 pmp), and the lowest in Bangladesh (0.03 pmp; Table 2). Home HD was generally unavailable in the region, except in India, where only a few people living with KF were using this modality. None of the countries in this region had a national transplant waitlist. Regional or hospital-based transplant waitlists were available in India and Sri Lanka. Both living and deceased donor transplant services were available in India and Sri Lanka, whereas Bangladesh, Nepal, and Pakistan relied solely on living donor programs.

Health information systems, statistics, national health policy, and early identification mechanisms for kidney disease. Policies or programs addressing the growing burden of kidney diseases were absent, incomplete, or very recent in most countries in the ISN South Asia region. Only 1 (14%) country had a registry for nondialysis CKD, whereas 2 (29%) countries reported the availability of a dialysis registry, and another 2 (29%) countries had a KT registry (Figure 2). An acute kidney injury registry was not available in any of the countries in the region.

In comparison, early detection of CKD in high-risk groups is a recognized priority in many South Asian countries. Seventy-five percent (n = 6) of countries reported offering routine testing for CKD in high-risk groups such as those

with hypertension, diabetes, cardiovascular disease, and autoimmune/multisystem disease. However, none (n = 7) of the participating countries had an existing CKD early detection program based on national policy or guidelines, and none (n = 6) had a mechanism to ensure the validity and quality of data in the health information systems.

Causes of hospitalization and death among people living with kidney failure on dialysis. In 3 countries (50%), 21% to 50% of people living with KF treated with HD required hospital admissions within 1 year of initiation, with access-related infections such as fistula or graft infection or catheter-related septicemia reported as the commonest reason for hospitalization in 4 (67%) countries followed by cardiovascular diseases (n = 1, 17%) and infections from other sources (n = 1, 17%). In 2 (33%) countries, approximately 11% to 50% of people living with KF and treated with HD died within 1 year of the initiation of dialysis, with adverse cardiovascular events being the main cause of death across all countries (n = 6, 100%; Supplementary Tables S2A–S2D).

For people living with KF and treated with PD, up to 21% to 30% required at least 1 hospital admission within 1 year of the initiation of dialysis in 2 (40%) countries. PD-related infections were the commonest cause of hospitalization (n = 3, 60%) followed by cardiovascular disease (n = 1, 20%) and access malfunction such as catheter tip migration or catheter tip block (n = 1, 20%). Cardiovascular diseases were the commonest cause of death in people treated with PD (n = 3, 60%), whereas PD-related infections were the second commonest cause of death (n = 2, 40%) in people treated with PD in the region (Supplementary Tables S2E–S2H).

Discussion

Data analysis from the 2023 ISN-GKHA reveals continuing inadequacies in all domains of kidney care in the ISN South Asia region, including a lack of capacity for CKD identification and monitoring and capacity for KRT. The lack of registries, poor data gathering and reporting systems, low spending on health, severe shortages in health care personnel, lack of health care policies, and poor advocacy to address these issues are significant challenges for advancing kidney disease care in the region.[19] Data from other ISN regions show that the majority of high-income or upper-middle–income countries have relatively less severe shortages of nephrologists and other kidney care professionals, whereas the low-income countries and the LMICs have severe shortages. Compared to global statistics on the prevalence of health care professionals, the ISN South Asia region has the second lowest prevalence of specialist physicians, medical doctors, and nurses after Africa.[39]

The number of nephrologists (pmp) and trainee nephrologists in the region increased compared to 2019 ISN-GKHA,[19,40] except in Afghanistan and Bhutan. It is encouraging that the density of nephrology trainees has increased in Pakistan; however, Maldives has the highest density of nephrologists but no trainee nephrologists. The current shortage of nephrologists is likely to improve in the future because the nephrology trainee numbers have improved in most of the countries. Despite improvements, there is a reported shortage of other categories of health care personnel required for kidney care within the region. Nepal and Sri Lanka also report a shortage of some specialists as shown in Supplementary Figure S1. Coordination between countries in the region and increased support for training various health care personnel within the region are suggested to improve the care of people with CKD.

The ISN South Asia region is also affected by CKD of unknown etiology, with many hot spots identified in Sri Lanka and India.[41–43] Exposure to an environmental toxin is the likely cause of the disease in this region, and putative contributors include agrochemicals,[43] heavy metals,[44] hardness of water,[45] increased fluoride levels in water,[46] and infections such as leptospirosis and hantavirus. Moreover, this region faces a dual threat because traditional risk factors for CKD, including diabetes and hypertension, are on an alarming upswing.[47,48] The convergence of these emerging and traditional risk factors portends dramatic increases in the incidence and prevalence of CKD in the region, demanding concerted and multifaceted intervention strategies.

With increasing disease burden, demand for KRT is also rising. The choice of dialysis modality in the region is mainly driven by the national policy for dialysis, public funding, out-of-pocket expenditure, resources, expertise, and acceptability of patients.[49–51] Shared decision making in choosing dialysis modality needs to be improved in most countries. In a survey study from Pakistan, 46% of people on dialysis preferred a treatment plan focused on comfort and symptom management rather than life extension.[52] Shared decision making is only available in Bangladesh, India, and Maldives. In addition, choice-restricted CKM is available in Nepal and Sri Lanka. HD is the preferred choice of dialysis in Nepal because it is funded by the government.[53] In India, both HD and PD services have recently been included under the Prime Minister National Dialysis Program, which provides free services to all those below the poverty line.[54] However, all states have not uniformly opted for it, and a few states have respective state government–funded dialysis services.

KT services were largely inadequate in the region. KT programs were mainly living donor based, and deceased donor programs were limited to India and Sri Lanka. Reports show that, in India, approximately 35% of people refused deceased organs, and 68% of living kidney donors were females.[38] There is a wide gender discrepancy between recipients and donors; most recipients are men, and donors are women.[55,56] The overall cost of KT in the region is cheaper than in most developed nations with median first-year cost reported as US $4143 (Table 1).[23–29]

Despite the high burden of CKD on the health care system, there is a lack of CKD-specific policies and advocacy for CKD in most of the countries in the region.[9,57] The inconsistent national health policies and funding across the countries in the region remain a concern and require improvement in most countries of the region. The ideal is to capture every

aspect of health care services in a centrally linked, country-wide data system, which is not possible with the present health care expenditure in the low-income countries and LMICs with low resources in the region, where priority is given to immediate health care needs for infectious disease, nutrition, and sanitation.[58–60]

For diseases covered under national or regional programs (screening, surveillance, treatment, etc.), data are collected and collated at regular intervals to assess the impact of the policy that governs such programs. Unfortunately, until recently, the public health impact of kidney diseases was not uniformly accorded significance in the region. For example, although the National Program for Prevention and Control of Cancer, Diabetes, Cardiovascular diseases, and Stroke was rolled out by the government of India in 2010, CKD was only included in 2022.[61] With this recognition, government agencies in India, such as the Indian Council of Medical Research and the Department of Health Research in India, now publish standard treatment workflows for the management of various kidney diseases at primary, secondary, and tertiary care centers.[62] Furthermore, in India, the Prime Minister National Dialysis Program,[54] which provides dialysis through a public-private partnership model free to people with incomes below the poverty line, is a helpful solution. PD has also been included in the Prime Minister National Dialysis Program, and many states of India have implemented a PD-favored policy.

The advocacy for kidney disease care with national health policymakers is insufficient across regions. Only Nepal and Sri Lanka reported the availability of advocacy groups for CKD and KRT, respectively (Figure 2). The national nephrology societies also lack advocacy committees to approach the government. Advocacy at the national and international levels in planning innovative programs using collaborative approaches is required. Examples of such models are programs such as the ISN Mentorship and ISN Sister Renal Centers, which enhance learning for nephrology trainees and internists.[63]

Political and civil unrest in some of the countries of this region (e.g., Afghanistan) has been responsible for persistent deficiencies of kidney care professionals and trainees, as is evident from prior ISN-GKHA reports. Most countries in the region, including India, face gross urban-rural disparities in workforce availability. Kidney care specialists are mostly concentrated in urban and metropolitan cities, making it difficult for the population from rural and geographically remote locations to avail themselves of care by specialists. Despite these challenges, there are opportunities to improve the availability and access to nephrologists. Utilizing and enhancing the use of telemedicine and telenephrology, designing fellowships, and training of the primary health care providers and point-of-contact health care workers may have add-on values in the early diagnosis of kidney disease, timely referrals for specialist care, and assistance in providing CKM.

The lack of availability of disease registries and reporting of outcomes (e.g., death) remain critical barriers to improving care delivery. From published reports, people with CKD in the region are relatively younger than those in developed nations, and data from India[64] show high mortality rates due to KF among people with diabetes in their 40s. Cardiovascular and infection-associated death appears to be common reasons for mortality and hospitalization. One of the Indian centers reported left ventricular failure (59.1%) as the most common cause of hospitalization followed by pneumonia (14.2%).[65] Studies from Pakistan and Bangladesh also reported left ventricular failure as the leading cause of admissions followed by sepsis, mostly urinary tract infections.[66] Findings from the National Dialysis Network Program in India reported a 2-year mortality of 19.2% in people treated with maintenance HD.[67] Another study from India reported that ischemic heart disease and sepsis accounted for 60% of deaths followed by vascular access–related infections. Similarly, a study from Pakistan also reported sepsis (63.5%) as the commonest cause of mortality on dialysis.[68]

Given the low health care expenditure and lack of nephrologists, there is a need for primary care physicians trained for kidney disease care and paramedical health care personnel to identify and manage CKD patients in the early stages.[69] The lack of policies on timely referral resulting in often late referrals to nephrologists remain a challenge for a smooth transition to KRT.[70]

In the absence of national registries and exact data on challenges for CKD care in the region, the data available in the 2023 ISN-GKHA may be used by policymakers and advocacy groups to draw the attention of the stakeholders and policymakers in budgeting, financing, and improving the CKD care in the ISN South Asia region. There were some limitations to the 2023 ISN-GKHA; these have been discussed.[20] However, this work is important for guiding kidney care policy in the ISN Middle East region.

APPENDIX

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SUPPLEMENTARY MATERIAL

Supplementary File (PDF)

Supplementary Table S1. Burden of chronic kidney disease and its risk factors in the International Society of Nephrology (ISN) South Asia region.

Supplementary Table S2A. Estimated first-year mortality among people treated with hemodialysis (HD) in the International Society of Nephrology (ISN) South Asia region.
Supplementary Table S2B. Estimated proportion of people treated with hemodialysis (HD) who require at least 1 hospitalization in the first year of dialysis in the International Society of Nephrology (ISN) South Asia region.
Supplementary Table S2C. Common causes of hospitalization among people treated with hemodialysis (HD) in the International Society of Nephrology (ISN) South Asia region.
Supplementary Table S2D. Common causes of death among people treated with hemodialysis (HD) in the International Society of Nephrology (ISN) South Asia region.
Supplementary Table S2E. Estimated first-year mortality among people treated with peritoneal dialysis (PD) in the International Society of Nephrology (ISN) South Asia region.
Supplementary Table S2F. Estimated proportion of people treated with peritoneal dialysis (PD) who require at least 1 hospitalization in the first year of dialysis in the International Society of Nephrology (ISN) South Asia region.
Supplementary Table S2G. Common causes of hospitalization among people treated with peritoneal dialysis (PD) in the International Society of Nephrology (ISN) South Asia region.
Supplementary Table S2H. Common causes of death among people treated with peritoneal dialysis (PD) in the International Society of Nephrology (ISN) South Asia region.
Supplementary Figure S1. Workforce shortages for medical kidney failure care in the South Asia region.

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