

THE GLOBAL KIDNEY HEALTH ATLAS



<Congress title>

Date

Overview

- Aim
- Methods
- Key Results
- Implications



Aim of the Global Kidney Health Atlas



To understand, compare and monitor how different countries around the world detect, treat, monitor and advocate for people with kidney disease (AKI or CKD)

Key focus on availability, accessibility, affordability and quality of ESKD care

Global Kidney Health Atlas survey



Design and scope

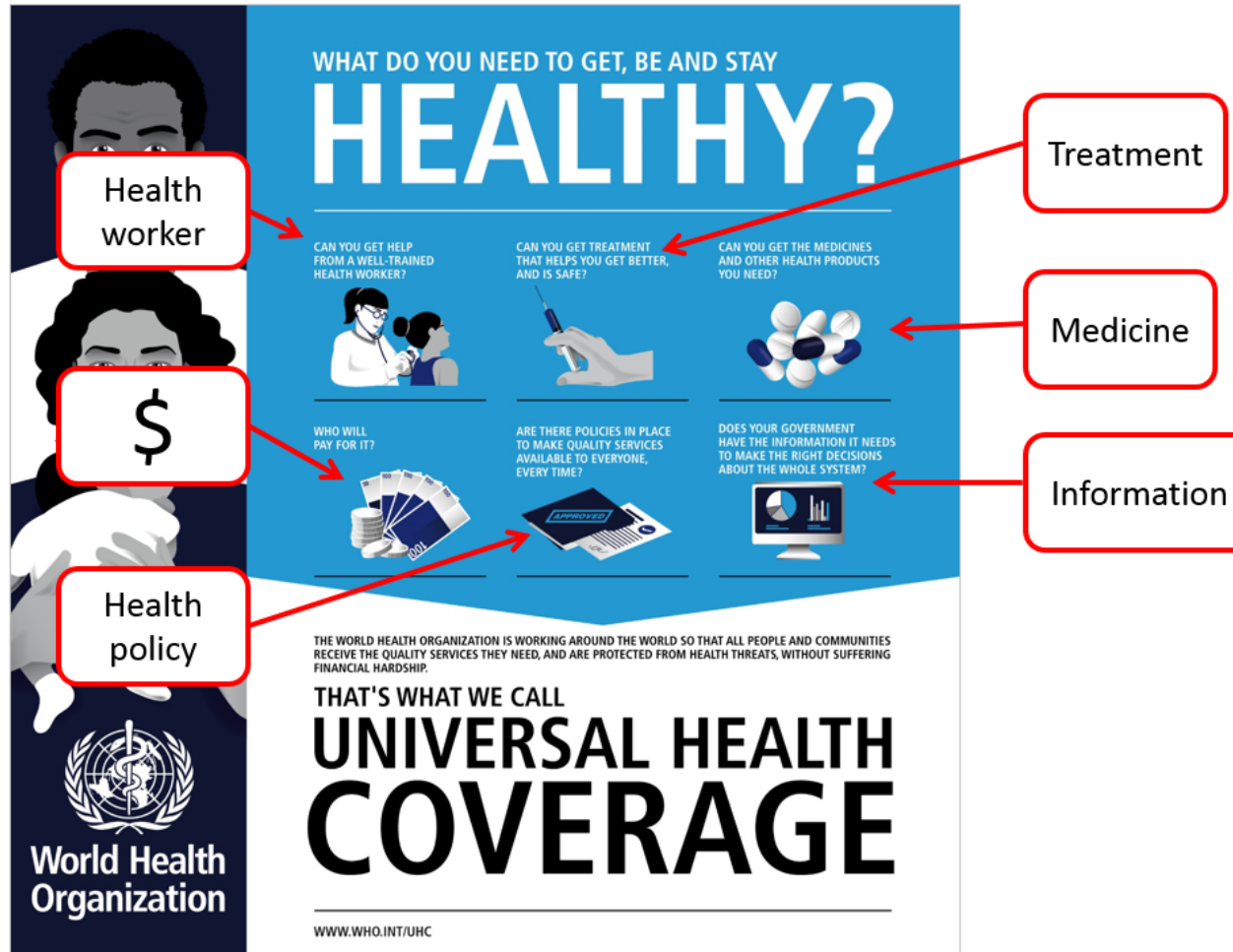
Desk research (across countries and regions)

- Published and grey literature review
- Systematic review ESKD burden and outcomes
- Data extraction from major renal registries (USRDS, ERA-EDTA) and relevant national registries where available
- Scoping review of KRT cost estimates

Online questionnaire-based survey July – September 2018

- 3 languages (English, French, Spanish)
- Across 182 countries
- ≥ 3 stakeholders per country
 - National nephrology society leadership
 - Healthcare policymakers
 - Patients / patient advocacy groups
- Discrepancies resolved by follow-up conferences with regional and country nephrology leaders

Overall survey components



WHAT DO YOU NEED TO GET, BE AND STAY HEALTHY?

Health worker → CAN YOU GET HELP FROM A WELL-TRAINED HEALTH WORKER?

Treatment → CAN YOU GET TREATMENT THAT HELPS YOU GET BETTER, AND IS SAFE?

Medicine → CAN YOU GET THE MEDICINES AND OTHER HEALTH PRODUCTS YOU NEED?

\$ → WHO WILL PAY FOR IT?

Health policy → ARE THERE POLICIES IN PLACE TO MAKE QUALITY SERVICES AVAILABLE TO EVERYONE, EVERY TIME?

Information → DOES YOUR GOVERNMENT HAVE THE INFORMATION IT NEEDS TO MAKE THE RIGHT DECISIONS ABOUT THE WHOLE SYSTEM?

THE WORLD HEALTH ORGANIZATION IS WORKING AROUND THE WORLD SO THAT ALL PEOPLE AND COMMUNITIES RECEIVE THE QUALITY SERVICES THEY NEED, AND ARE PROTECTED FROM HEALTH THREATS, WITHOUT SUFFERING FINANCIAL HARDSHIP.

THAT'S WHAT WE CALL
UNIVERSAL HEALTH COVERAGE

WWW.WHO.INT/UHC

Overall GKHA response

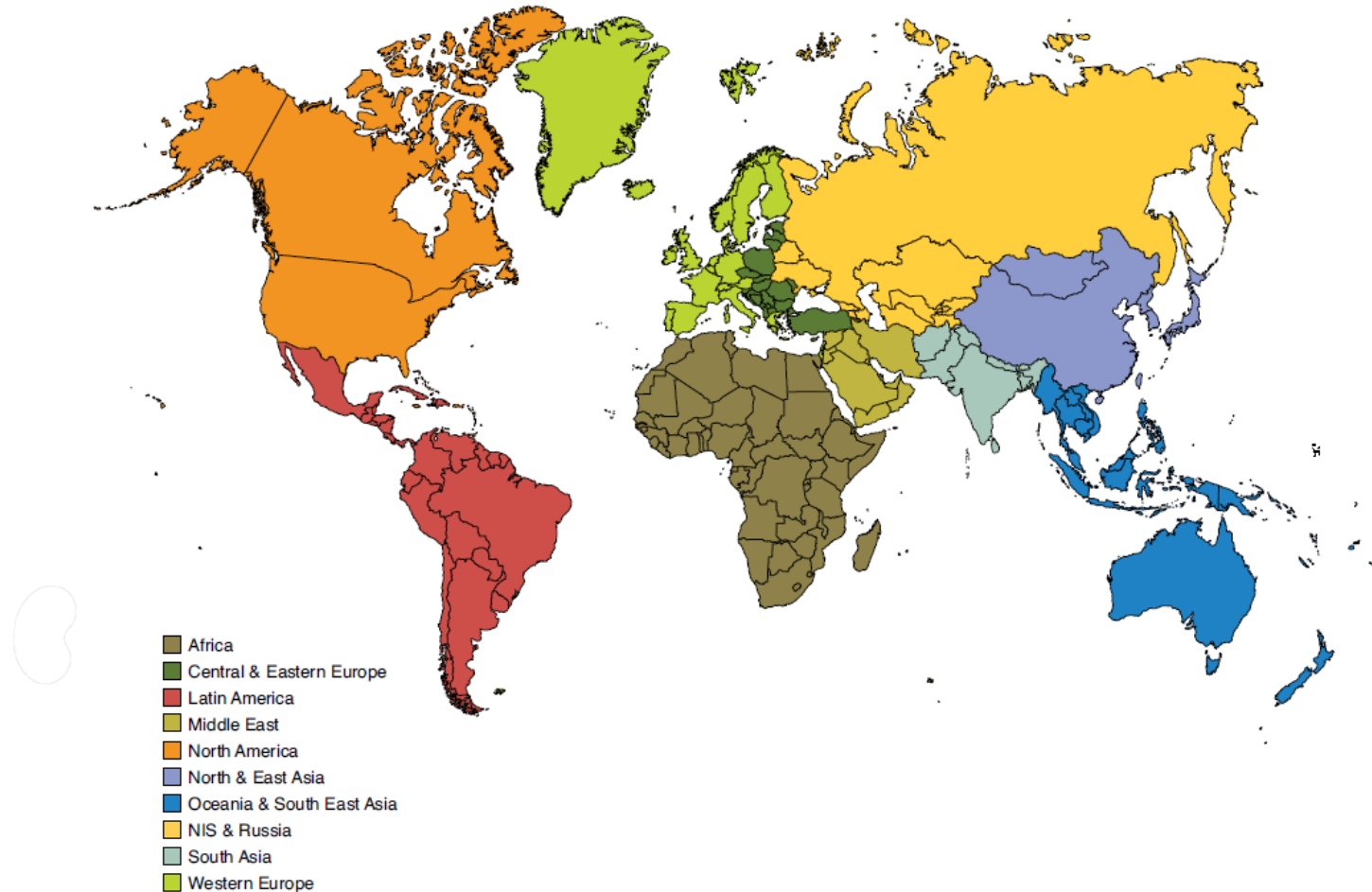
■ Participated in survey ■ Did not participate in survey



160 countries (88%)
99% world's population
317 individuals (69%) response
3 respondents/country (IQR 2-4)

113 countries participated
in both GKHA surveys

Results presented by ISN regions



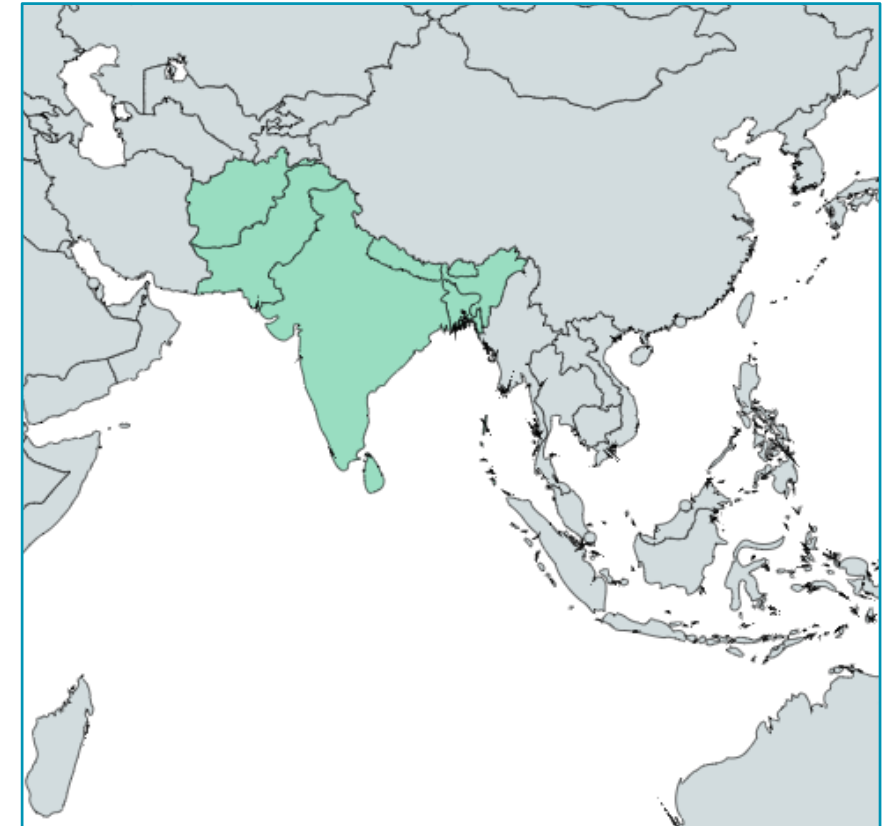
ISN Region: South Asia



Demographics

Country	World bank ranking	Area (sq km)	Total population (2018)	GDP (PPP) (\$ billion)	Total health expenditures (% of GDP)
Afghanistan	Low income	652,230	34,940,837	69.45	10.2
Bangladesh	Lower middle income	148,460	159,453,001	690.3	2.4
Bhutan	Lower middle income	38,394	766,397	7.205	3.5
India	Lower middle income	3,287,263	1,296,834,042	9474	3.9
Maldives	Upper middle income	298	392,473	6.901	10.6
Nepal	Low income	147,181	29,717,587	79.19	6.1
Pakistan	Lower middle income	796,095	207,862,518	1061	2.7
Sri Lanka	Upper middle income	65,610	22,576,592	275.8	3.0

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CKD and its risk factors burden

Country	CKD Prevalence % (95% CI)	Death attributed to CKD % (95% CI)	DALYS attributed to CKD % (95% CI)	Obesity % (95% CI)	Increased BP % (95% CI)	Smoking % (95% CI)
Afghanistan	5.01 (4.63 - 5.46)	1.72 (1.52 - 1.97)	1.09 (0.95 - 1.26)	4.5 (2.8 - 6.7)	30.6 (23.6 - 38.3)	13.1 (10.4 - 16.2)
Bangladesh	7.28 (6.74 - 7.9)	1.89 (1.74 - 2.05)	1.27 (1.15 - 1.39)	3.4 (2.2 - 4.7)	24.7 (19.1 - 30.6)	19.3 (16.8 - 22.0)
Bhutan	7.49 (6.93 - 8.06)	3.28 (2.75 - 3.71)	1.95 (1.61 - 2.26)	5.8 (3.8 - 8.2)	28.1 (21.9 - 34.6)	6.6 (5.4 - 8.0)
India	8.5 (7.88 - 9.16)	2.26 (2.1 - 2.37)	1.53 (1.41 - 1.63)	3.8 (2.9 - 4.9)	25.8 (21.3 - 30.7)	9.8 (9.4 - 10.3)
Maldives	9.34 (8.57 - 10.16)	5.93 (5.45 - 6.41)	2.66 (2.29 - 3.05)	7.9 (5.5 - 10.8)	24.4 (17.9 - 31.5)	-
Nepal	7.48 (6.95 - 8.11)	2.67 (2.25 - 3.04)	1.71 (1.43 - 2)	3.8 (2.6 - 5.2)	29.4 (23.6 - 35.7)	16.7 (13.8 - 19.9)
Pakistan	7.09 (6.57 - 7.67)	2.6 (2.23 - 2.96)	1.65 (1.42 - 1.93)	7.8 (5.7 - 10.3)	30.5 (24.4 - 37.4)	10.5 (8.9 - 12.2)
Sri Lanka	13.24 (12.26 - 14.31)	3.58 (3.27 - 3.9)	2.39 (2.12 - 2.67)	5.4 (3.7 - 7.7)	22.4 (16.5 - 29.3)	10.0 (8.7 - 11.4)

Abbreviations:

CKD (Chronic Kidney Disease),
DALYS (disability-adjusted life years),
BP (blood pressure),
CI (confidence interval)

Data sources:

GBD study database
(<http://www.healthdata.org/gbd>),
WHO data observatory
(<https://www.who.int/gho/en/>)

' - ' : data not reported/unavailable

Burden of ESKD

Prevalence of treated ESKD



■ <433.0 pmp
 ■ 433.0–759.0 pmp
 ■ 759.1–1048.0 pmp
 ■ >1048.0 pmp
 ■ Data not reported

Country	Treated ESKD		Chronic dialysis (HD+PD)		Chronic HD		Chronic PD	
	Incidence	Prevalence	Incidence	Prevalence	Incidence	Prevalence	Incidence	Prevalence
Afghanistan	-	-	-	-	-	-	-	-
Bangladesh	51	117	-	113	-	112.1	-	1.8
Bhutan	-	-	-	-	-	-	-	-
India	-	-	-	49.2	-	18	-	5.8
Maldives	-	-	-	-	-	-	-	14.4
Nepal	-	-	-	11.6	-	10.1	-	1.5
Pakistan	-	-	-	53.3	-	34.3	-	0.2
Sri Lanka	-	-	-	-	-	-	-	0.6

Treated ESKD: all dialysis + transplant

* pmp (per million population)

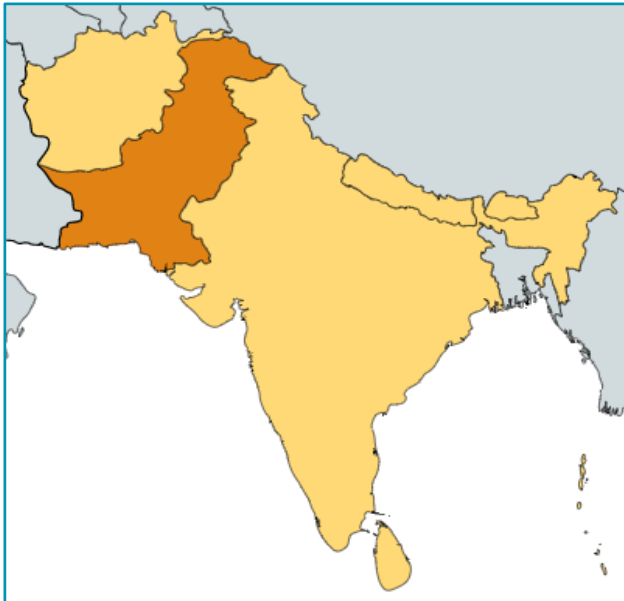
Data sources: Abu-Aisha & Elamin (Peritoneal Dialysis International) 2010, Jain et al. (JASN) 2012, Liyanage et al. (The Lancet) 2015, 2017/2018 USRDS Annual Data Report

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Burden of ESKD (cont'd)

Incidence of kidney transplantation



■ <5.2 pmp
 ■ 5.2–13.5 pmp
 ■ 13.6–37.8 pmp
 ■ >37.8 pmp
 ■ Data not reported

Country	Kidney transplantation				
	Incidence overall	Prevalence overall	Incidence of deceased donor	Incidence of living donor	Incidence of pre-emptive
Afghanistan	0.18	-	0	0.18	-
Bangladesh	-	-	-	-	-
Bhutan	4.96	-	0	4.96	-
India	3.51	-	0	3.51	-
Maldives	-	-	-	-	-
Nepal	4.75	-	0	4.75	-
Pakistan	14.08	-	0	14.08	-
Sri Lanka	0.18	-	0	0.18	-

* pmp (per million population)

Data sources: GODT database

<http://www.transplant-observatory.org/data-charts-and-tables/>

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Annual cost of kidney replacement therapy components

Country	Hemodialysis	Peritoneal dialysis	Kidney Transplant (First year)	Kidney Transplant (later years)	HD/PD cost ratio
Afghanistan	-	-	-	-	-
Bangladesh	5,202	7,219	3,285	-	0.72
Bhutan	-	-	-	-	-
India	9,849	15,538	9,238	10,367	0.63
Maldives	-	-	-	-	-
Nepal	2,727	-	-	-	-
Pakistan	4,873	8,606	-	-	0.57
Sri Lanka	26,242	8,921	-	-	2.94

*Cost is in \$US 2016

Abbreviations:
HD (hemodialysis),
PD (peritoneal dialysis)

Data sources:
Abraham et al. (2008), Hirachan et al. (2010), Jeloka et al. (2012), Jindal et al. (2011), Khanna (2009), Li & Chow (2001), Naqvi (2000), Ranasinghe et al. (2011), Shaikh et al. (2018), Suja et al. (2012), van der Tol et al. (2019)

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Survey response

- 7 of 8 countries in South Asia (88%) responded to the 2018 survey
- This represents 99% of the region's population

Country level scorecard

Countries	Availability of KRT and CKM				Funding for Medications		Availability and Distribution of Registry				Advocacy Group			Nephrology Workforce (PMP)	
	Chronic hemodialysis	Chronic peritoneal dialysis	Kidney transplantation	CKM	Dialysis medications	Transplant medications	CKD	Dialysis	Transplantation	AKI	CKD	AKI	ESKD/RRT	Nephrologists	Nephrologist trainees
South Asia															
Afghanistan	2017														
	2019	Yes	No	Yes	No	No		No	No	No	No	No	No	0.14	
Bangladesh	2017	Yes	Yes	Yes			No	Yes	Yes	No	No	No	No	0.65	0.71
	2019	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	No	0.88	0.25
Bhutan	2017														
	2019	Yes	Yes	No	Yes	No			No	No	No	Yes	1.30	0.00	
India	2017		Yes	Yes			No	No	No	No	Yes		1.04	0.24	
	2019	Yes	Yes	Yes	No	No	No	No	No	No	Yes	No	1.39	0.15	
Nepal	2017		Yes	Yes			No	No	No	No	No	No	1.01	0.25	
	2019	Yes	Yes	Yes	No	No	No	No	No	No	Yes	No	1.68	0.34	
Pakistan	2017		Yes	Yes			No	Yes	Yes	No	No	No	2.51	1.26	
	2019	Yes	Yes	Yes	No	No	No	No	No	No	No	No	0.63	1.14	
Sri Lanka	2017	Yes	Yes	Yes			No	No	No	No	Yes	No	0.91	0.54	
	2019	Yes	Yes	Yes	No	Yes	No	No	No	No	No	Yes	1.15	0.62	

Yes

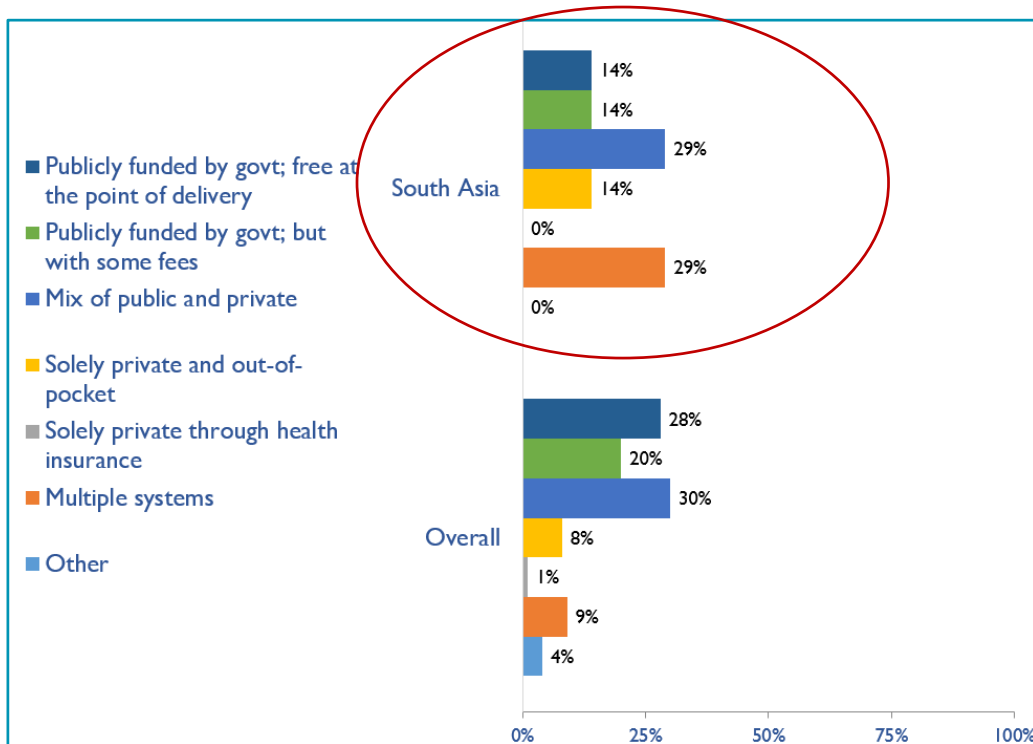
No

N/A

Abbreviations
 KRT: kidney replacement therapy
 CKM: conservative kidney management
 CKD: chronic kidney disease
 AKI: acute kidney injury
 ESKD: end stage kidney disease
 RRT: renal replacement therapy

Nephrologists density	<1.2 PMP	1.2–10.0 PMP	10.1–22.9 PMP	>22.9 PMP
Nephrology trainees density	<0.3 PMP	0.3–1.4 PMP	1.5–3.7 PMP	>3.7 PMP

Funding for non-dialysis CKD

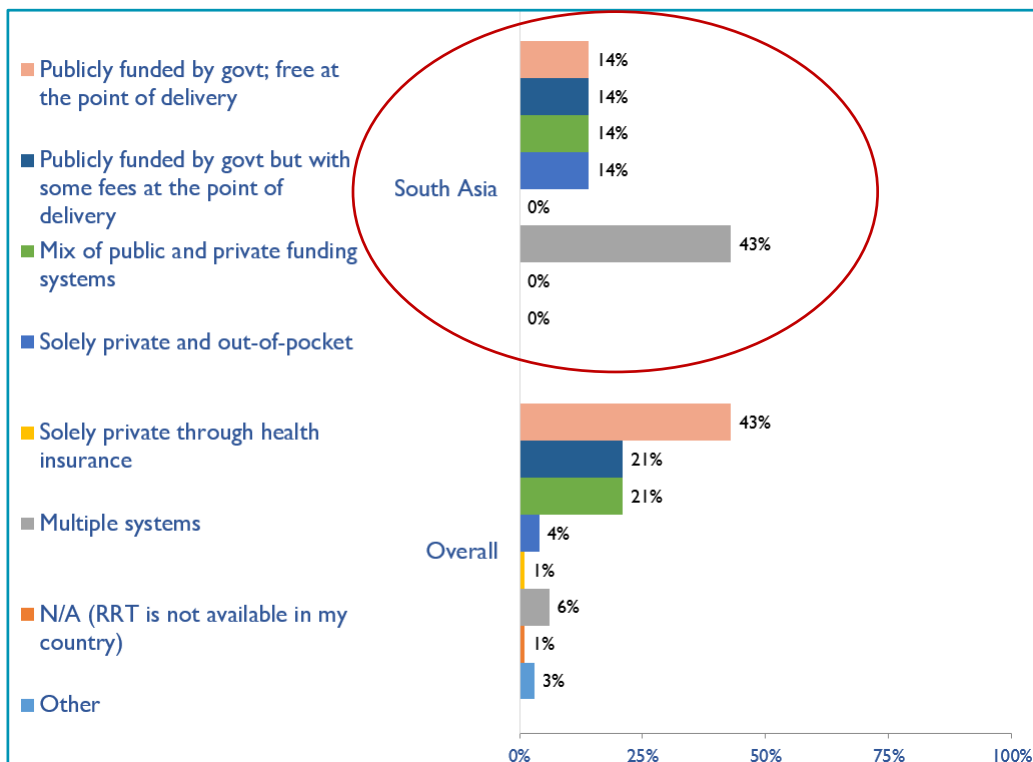


Country	Publicly funded by govt; free at the point of delivery	Publicly funded by govt but with some fees at the point of delivery	Mix of public and private funding systems	Solely private and out-of-pocket	Solely private through health insurance	Multiple systems	Other
Afghanistan				X			
Bangladesh						X	
Bhutan	X						
India						X	
Nepal			X				
Pakistan			X				
Sri Lanka		X					

X : Yes



Funding for kidney replacement therapy (KRT)

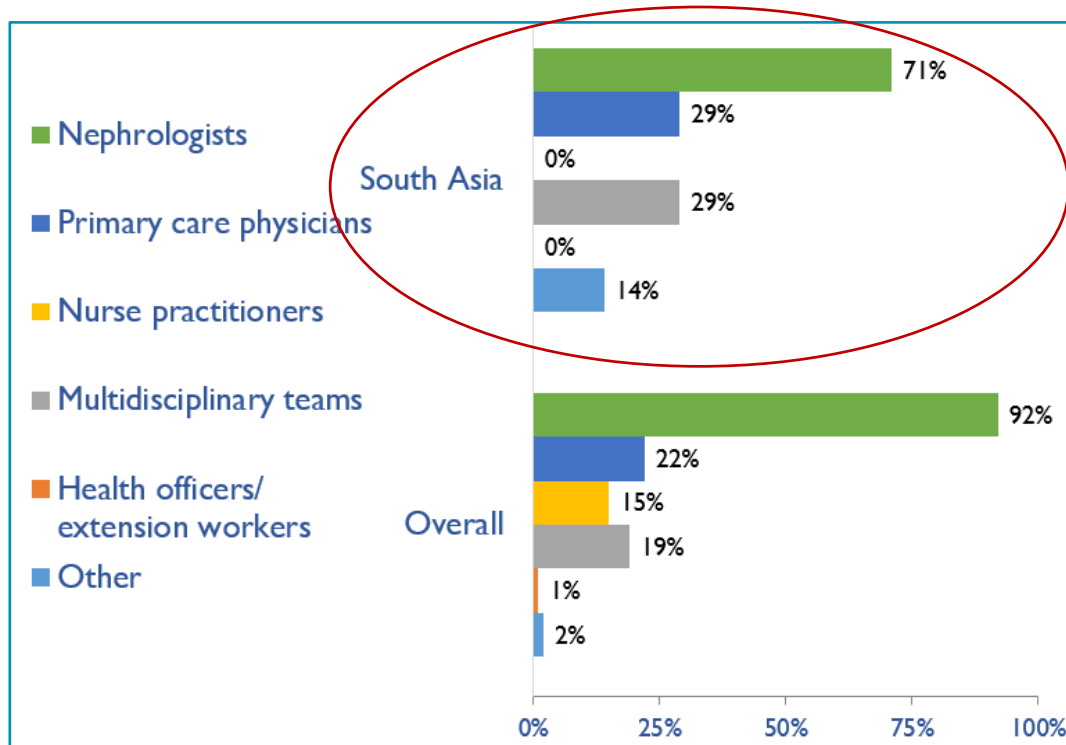


Country	Publicly funded by govt; free at the point of delivery	Publicly funded by govt but with some fees at the point of delivery	Mix of public and private funding systems	Solely private and out-of-pocket	Solely private through health insurance	Multiple systems	N/A (RRT is not available in my country)	Other
Afghanistan				X				
Bangladesh						X		
Bhutan	X							
India						X		
Nepal		X						
Pakistan						X		
Sri Lanka			X					

X : Yes



Providers primarily responsible for ESKD care



Country	Nephrologists	Primary care physicians	Nurse practitioners or specialized nurses	Multidisciplinary teams	Health officers/extension workers	Other
Afghanistan		X				
Bangladesh	X					
Bhutan				X		
India	X	X		X		
Nepal	X					
Pakistan	X					X
Sri Lanka	X					

X : Yes

Shortage of ESKD care providers

Country	Nephrologists	Transplant surgeons	Surgeons (HD access)	Surgeons (PD access)	Interventional radiologists (HD access)	Interventional radiologists (PD access)	Laboratory technicians	Dietitians	Radiologists (ultrasound)	Vascular access coordinators	Counsellors/psychologists	Transplant coordinators	Dialysis nurses	Dialysis technicians
Afghanistan	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage
Bangladesh	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage
Bhutan	Shortage	Shortage	Shortage	No shortage	Shortage	Shortage	No shortage	No shortage	No shortage	Shortage	Shortage	Shortage	No shortage	No shortage
India	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage
Nepal	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage
Pakistan	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage
Sri Lanka	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage	Shortage

No shortage

Shortage

Prevalence of nephrologists and trainees

Nephrologists



■ <1.2 pmp
 ■ 1.2–10.0 pmp
 ■ 10.1–22.9 pmp
 ■ >22.9 pmp
 ■ Data not reported

Nephrology trainees



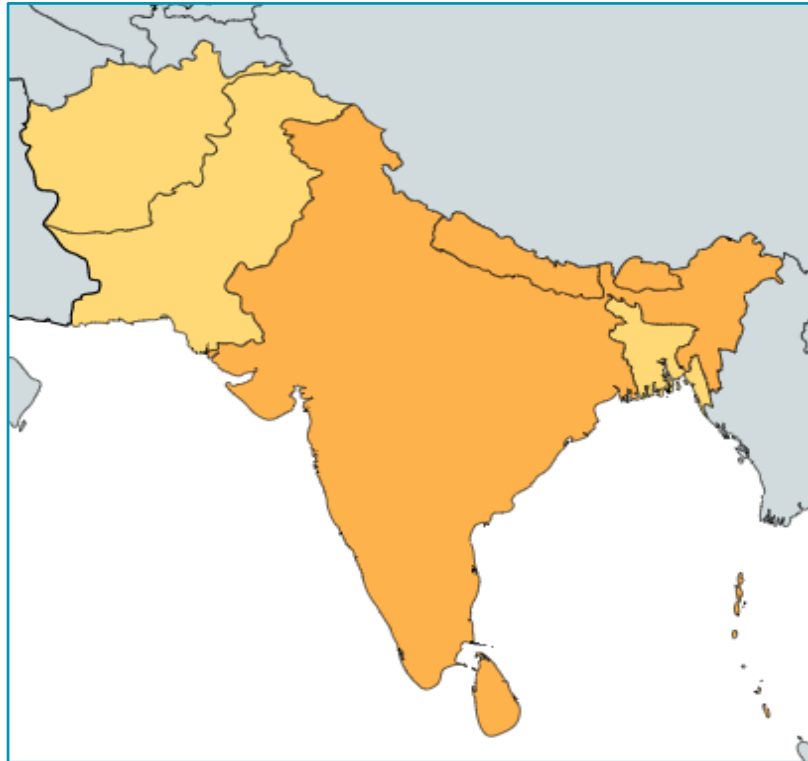
■ <0.3 pmp
 ■ 0.3–1.4 pmp
 ■ 1.5–3.7 pmp
 ■ >3.7 pmp
 ■ Data not reported


Country	Nephrologists PMP	Nephrology trainees PMP
Afghanistan	0.14	-
Bangladesh	0.88	0.25
Bhutan	1.30	0.00
India	1.39	0.15
Nepal	1.68	0.34
Pakistan	0.63	1.14
Sri Lanka	1.15	0.62

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Capacity for chronic dialysis (HD)

Chronic HD centers



 <1.2 pmp 1.2–4.5 pmp 4.6–9.9 pmp >9.9 pmp Data not reported

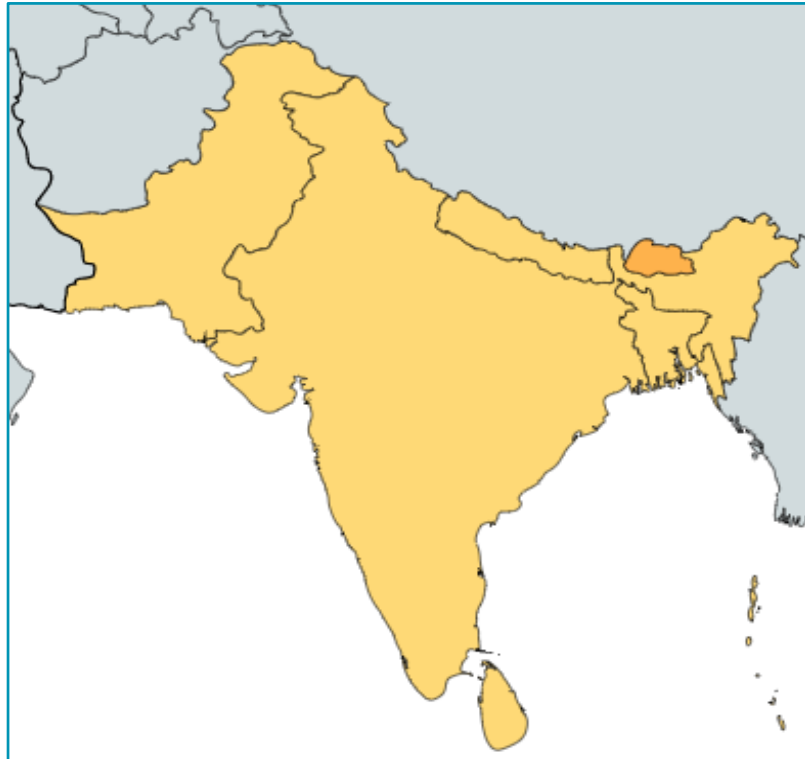
- Chronic HD services are available in all countries of the region
- The South Asia average of HD treatment centers is 1.39 pmp

Country	Chronic HD Centres PMP
Afghanistan	0.29
Bangladesh	0.63
Bhutan	3.91
India	1.39
Nepal	1.72
Pakistan	0.58
Sri Lanka	1.71

'-': data not reported/unavailable

Capacity for chronic dialysis (PD)

Chronic PD centers



- Chronic PD services are available in 6 (86%) countries of the region.
- The South Asia average of PD treatment centers is 0.15 pmp.

Country	Chronic PD Centres PMP
Afghanistan	-
Bangladesh	0.04
Bhutan	1.30
India	0.23
Nepal	0.17
Pakistan	0.01
Sri Lanka	0.13

' - ' : data not reported/unavailable

Chronic PD not provided <0.4 pmp 0.4–1.3 pmp 1.4–2.5 pmp >2.5 pmp Data not reported

Capacity for kidney transplantation

Kidney transplantation centers



Kidney transplantation not provided
 <0.2 pmp
 0.2–0.4 pmp
 0.5–0.7 pmp
 >0.7 pmp
 Data not reported

- Kidney transplantation services are available in 6 (86%) countries of the region.
- The South Asia average of kidney transplantation centers is 0.07 pmp.

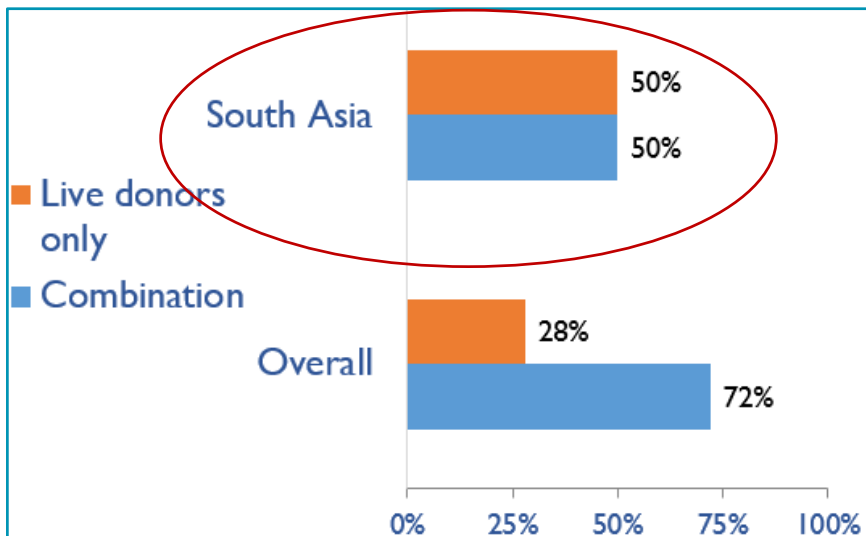
Country	Kidney Transplantation availability	Transplant centers PMP
Afghanistan	X	0.06
Bangladesh	X	0.04
Bhutan		-
India	X	0.19
Nepal	X	0.13
Pakistan	X	0.07
Sri Lanka	X	0.51

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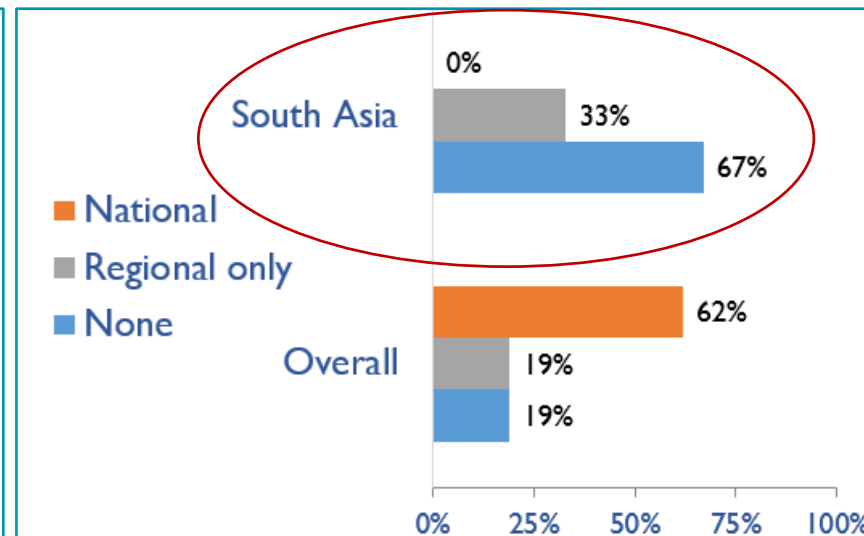
X: Yes

Capacity for kidney transplantation (cont'd)

Transplant donor type



Transplant waitlist

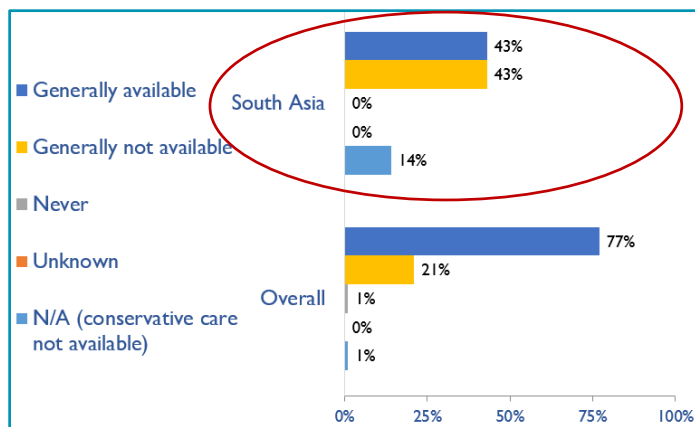


Country	Donor type		Transplant waitlist		
	Live donors only	Combination	National	Regional only	None
Afghanistan	X			X	
Bangladesh	X				X
Bhutan					
India		X		X	
Nepal	X				X
Pakistan		X			X
Sri Lanka		X			X

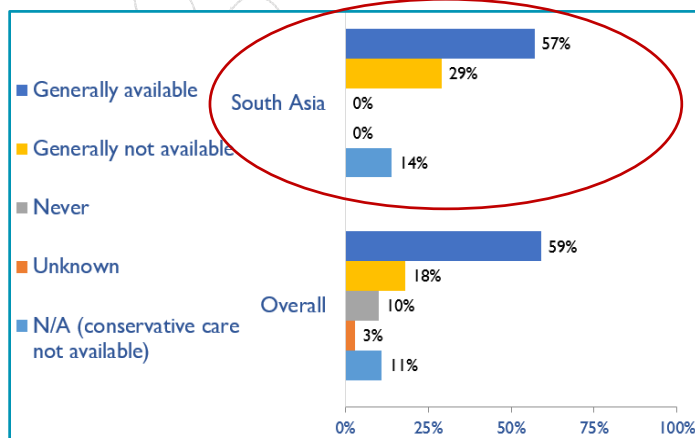
X : Yes

Availability of services within dialysis care

HD frequency



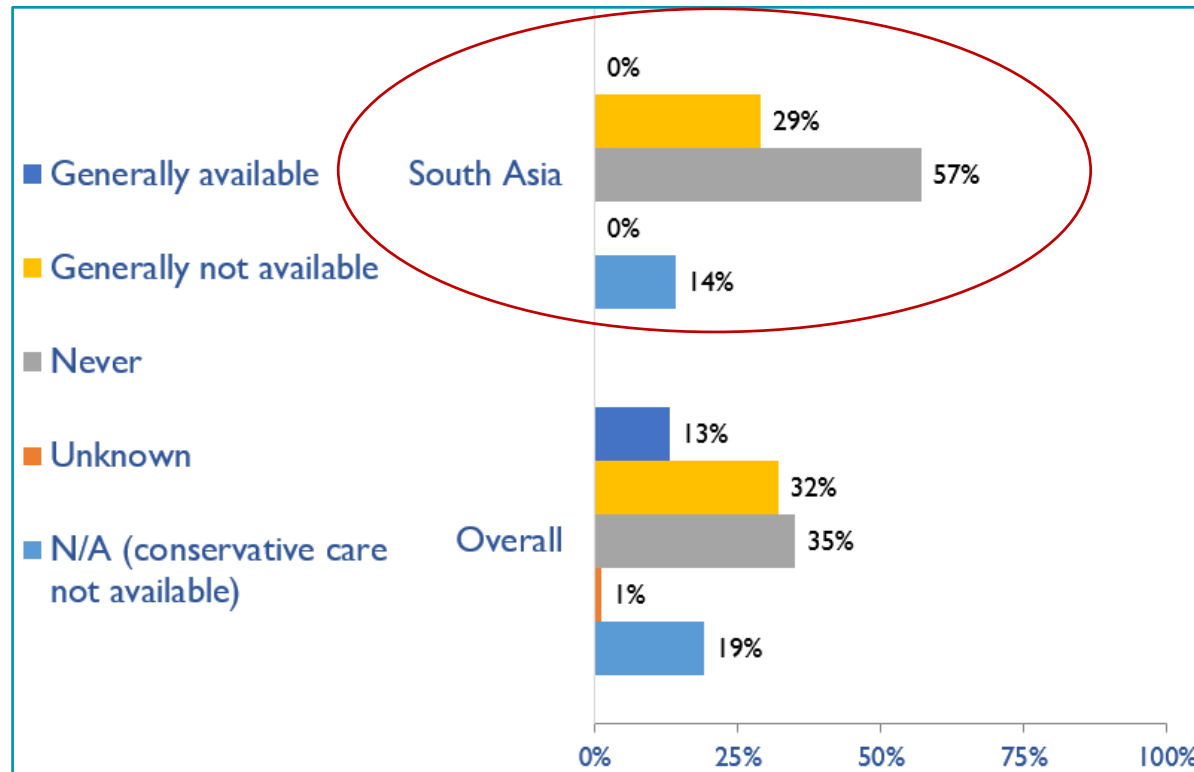
PD frequency



Country	HD frequency a center-based service that involves treatment 3x week/3-4x hours					PD frequency ability to do adequate exchanges 3-4x day (or equivalent cycles on automated PD)				
	Generally available	Generally not available	Never	Unknown	N/A (dialysis not provided)	Generally available	Generally not available	Never	Unknown	N/A (dialysis not provided)
Afghanistan					X					X
Bangladesh		X				X				
Bhutan		X					X			
India	X					X				
Nepal	X					X				
Pakistan	X					X				
Sri Lanka		X					X			

X : Yes

Availability of home hemodialysis

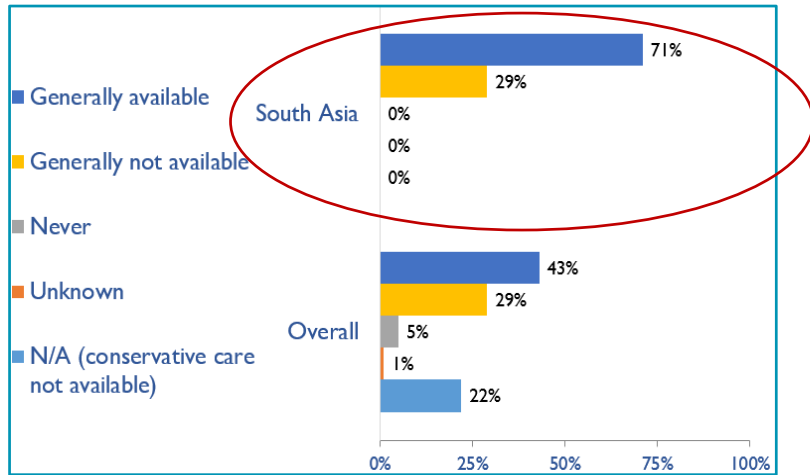


Country	Availability of Home hemodialysis				
	Generally available	Generally not available	Never	Unknown	N/A (dialysis not provided)
Afghanistan			X		
Bangladesh			X		
Bhutan			X		
India		X			
Nepal			X		
Pakistan			X		
Sri Lanka		X			

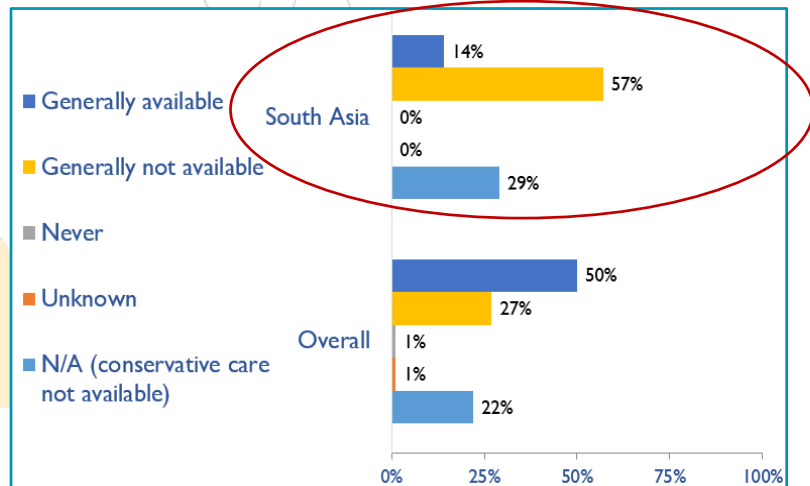
X : Yes

Capacity for conservative kidney management (CKM)

Choice-restricted CKM



Chosen or medically advised CKM

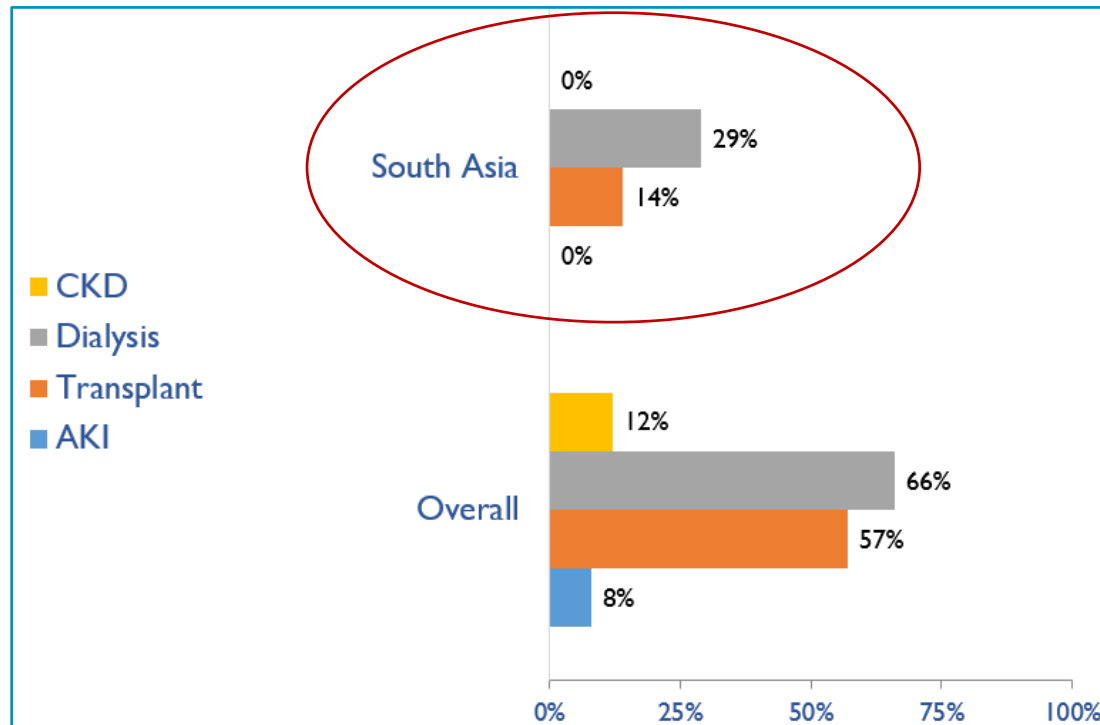


Country	Established choice-restricted conservative care					Established conservative care that is chosen or medically advised				
	Generally available	Generally not available	Never	Unknown	N/A (conservative care not available)	Generally available	Generally not available	Never	Unknown	N/A (conservative care not available)
Afghanistan		X					X			
Bangladesh	X									X
Bhutan		X					X			
India	X						X			
Nepal	X						X			
Pakistan	X									X
Sri Lanka	X					X				

X : Yes



Availability of official registry



Country	CKD	Dialysis	Transplant	AKI
Afghanistan		X		
Bangladesh			X	
Bhutan				
India				
Nepal				
Pakistan				
Sri Lanka		X		

X : Yes

Summary of 2019 GKHA findings

- KRT is highly availability, but limited access and quality
- Conservative kidney management is available, often choice-restricted
- Government funding for kidney care is low
- Few registries across all levels of kidney disease
- Many workforce limitations across all provider types
- Little advocacy for kidney disease in South Asia

Implications

- Increase health care financing for ESKD prevention and management
- Address workforce shortages through multidisciplinary teams and telemedicine
- Incorporate the collection and reporting of quality indicators in ESKD care
- Expand health information systems to prevent and manage ESKD
- Promote ESKD prevention and treatment by implementing policies, strategies, and advocacy, and mitigating barriers

To access the Atlas report:



<https://www.theisn.org/global-atlas>