

THE GLOBAL KIDNEY HEALTH ATLAS

<Congress title>

Date

www.theisn.org/global-atlas

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



2016

2018

2022

2026

Design and Scope

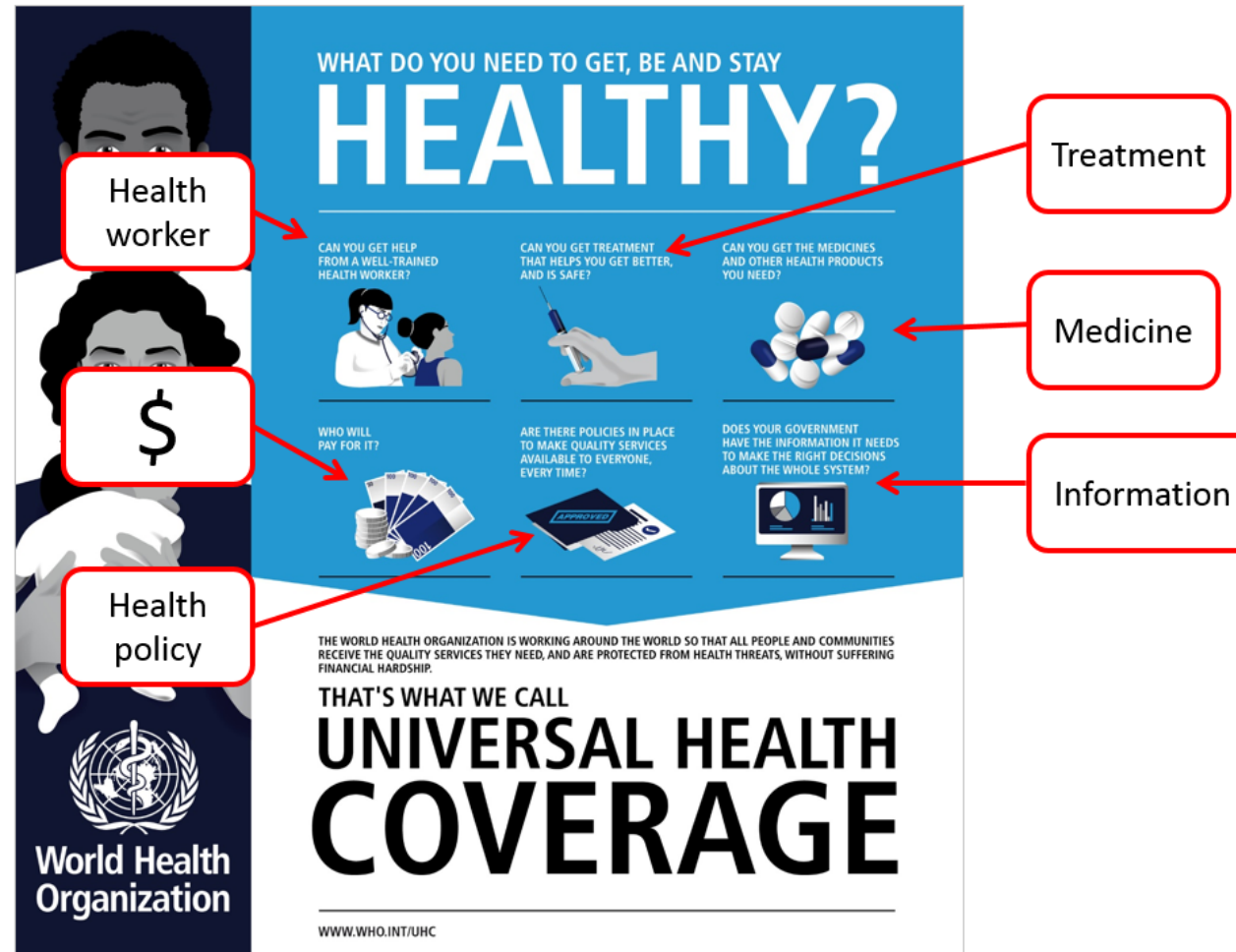
Desk research (across countries and regions)

- 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



Overall GKHA Response

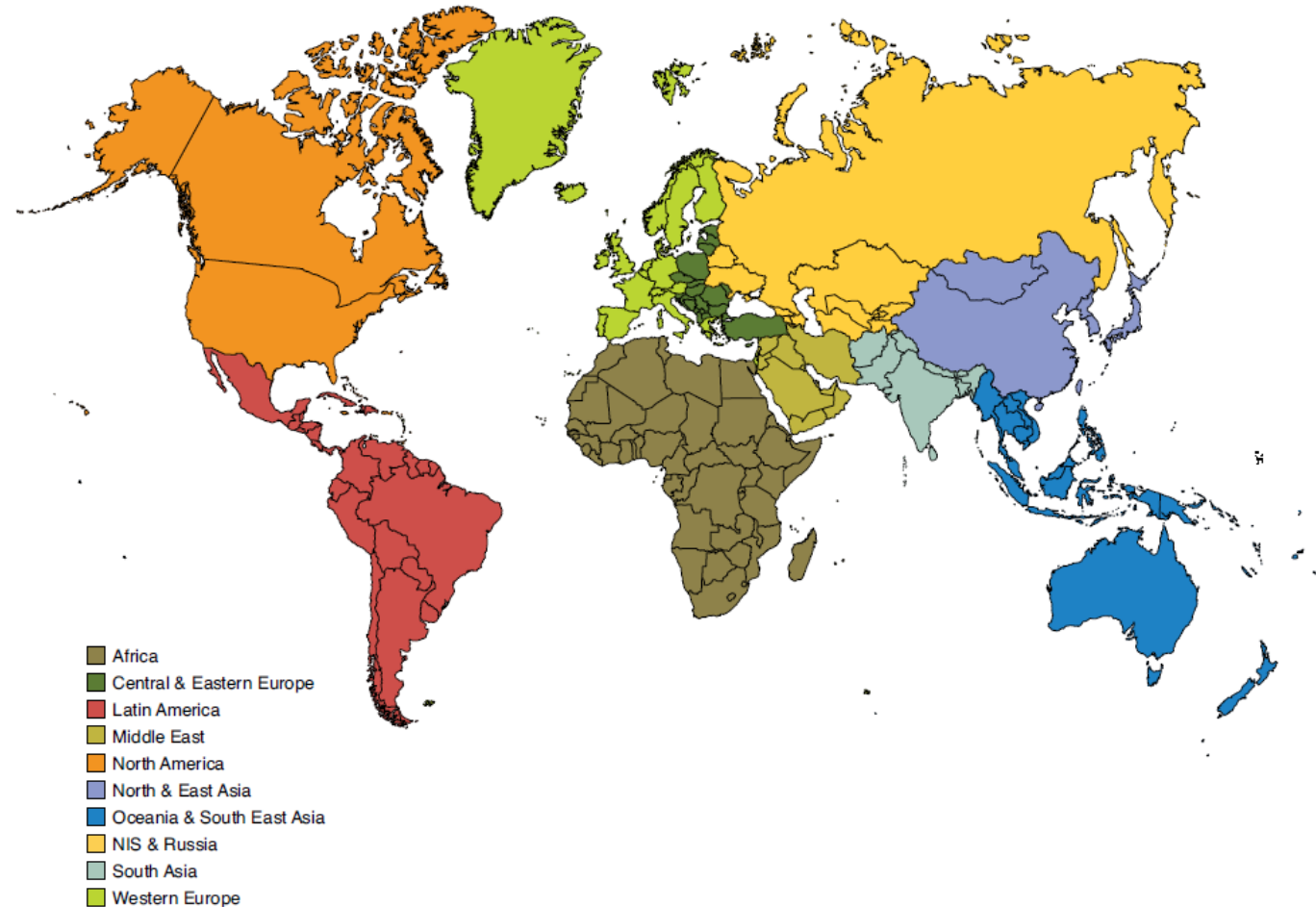
■ Participated in survey ■ Did not participate in survey



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: Africa



Demographics

Country	World bank ranking	Area (sq km)	Total population (2018)	GDP (PPP) (\$ billion)	Total health expenditures (% of GDP)
Algeria	Upper middle income	2,381,741	41,657,488	630	6.6
Angola	Lower middle income	1,246,700	30,355,880	193.6	2.9
Benin	Low income	112,622	11,340,504	25.39	3.9
Botswana	Upper middle income	581,730	2,249,104	39.01	5.5
Burkina Faso	Low income	274,200	19,742,715	35.85	6.8
Burundi	Low income	27,830	11,844,520	8.007	6.2
Cabo Verde	Lower middle income	4,033	568,373	3.777	5.2
Cameroon	Lower middle income	475,440	25,640,965	89.54	4.7
C African Republic	Low income	622,984	5,745,062	3.39	4.3
Chad	Low income	1,284,000	15,833,116	28.62	4.5
Comoros	Lower middle income	2,235	821,164	1.319	7.6
Congo, Dem. Rep.	Low income	2,344,858	85,281,024	68.6	3.9
Congo, Rep.	Lower middle income	342,000	5,062,021	29.39	4.6
Cote d'Ivoire	Lower middle income	322,463	26,260,582	97.16	4.4
Djibouti	Lower middle income	23,200	884,017	3.64	3.5
Egypt, Arab Rep.	Lower middle income	1,001,450	99,413,317	1204	4.6
Equatorial Guinea	Upper middle income	28,051	797,457	31.52	3.4
Eritrea	Low income	117,600	5,970,646	9.402	3.0
Ethiopia	Low income	1,104,300	108,386,391	200.6	4.0
Gabon	Upper middle income	267,667	2,119,036	36.66	2.7
Gambia, The	Low income	11,300	2,092,731	5.556	6.7
Ghana	Lower middle income	238,533	28,102,471	134	5.9
Guinea	Low income	245,857	11,855,411	27.97	4.5
Guinea-Bissau	Low income	36,125	1,833,247	3.171	6.9
Kenya	Lower middle income	580,367	48,397,527	163.7	5.2
Lesotho	Lower middle income	30,355	1,962,461	6.656	8.4
Liberia	Low income	111,369	4,809,768	6.112	15.2



‘ – ’ : data not reported/unavailable

Demographics (cont'd)

Country	World bank ranking	Area (sq km)	Total population (2018)	GDP (PPP) (\$ billion)	Total health expenditures (% of GDP)
Libya	Upper middle income	1,759,540	6,754,507	61.97	5
Madagascar	Low income	587,041	25,683,610	39.85	5.2
Malawi	Low income	118,484	19,842,560	22.42	9.3
Mali	Low income	1,240,192	18,429,893	41.22	5.8
Mauritania	Lower middle income	1,030,700	3,840,429	17.28	4.6
Mauritius	Upper middle income	2,040	1,364,283	28.27	5.5
Morocco	Lower middle income	446,550	34,314,130	298.6	5.5
Mozambique	Low income	799,380	27,233,789	37.09	5.4
Namibia	Upper middle income	824,292	2,533,224	26.6	8.9
Niger	Low income	1,267,000	19,866,231	21.86	7.2
Nigeria	Lower middle income	923,768	203,452,505	1121	3.6
Rwanda	Low income	26,338	12,187,400	24.68	7.9
Sao Tome & Principe	Lower middle income	964	204,454	0.686	9.8
Senegal	Lower middle income	196,722	15,020,945	54.8	4.0
Seychelles	High income	455	94,633	2.75	3.4
Sierra Leone	Low income	71,740	6,312,212	11.55	18.3
Somalia	Low income	637,657	11,259,029	20.44	-
South Africa	Upper middle income	1,219,090	55,380,210	767.2	8.2
South Sudan	Low income	644,329	10,204,581	20.01	2.5
Sudan	Lower middle income	1,861,484	43,120,843	177.4	6.3
Swaziland	Lower middle income	17,364	1,087,200	11.6	7.7
Tanzania	Low income	947,300	55,451,343	162.5	6.1
Togo	Low income	56,785	8,176,449	12.97	6.6
Tunisia	Upper middle income	163,610	11,516,189	137.7	6.7
Uganda	Low income	241,038	40,853,749	89.19	7.3
Zambia	Lower middle income	752,618	16,445,079	68.93	5.4
Zimbabwe	Lower middle income	390,757	14,030,368	34.27	10.3



‘ - ’ : data not reported/unavailable

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)
Algeria	9.18 (8.50 - 10.01)	2.73 (2.45 - 3.02)	1.57 (1.39 - 1.73)	26.6 (21.7 - 32.0)	25.1 (19.4 - 31.5)	10.3 (8.4 - 12.5)
Angola	5.45 (5.04 - 5.90)	1.53 (1.34 - 1.71)	0.86 (0.75 - 0.97)	6.8 (4.2 - 10.3)	29.7 (22.1 - 38.3)	6.7 (5.6 - 8.0)
Benin	6.08 (5.65 - 6.58)	1.6 (1.36 - 1.87)	0.96 (0.82 - 1.12)	8.2 (6.0 - 10.8)	27.7 (21.7 - 34.2)	4.1 (3.3 - 5.0)
Botswana	8.95 (8.29 - 9.66)	1.86 (1.6 - 2.11)	1.04 (0.9 - 1.18)	16.1 (12.3 - 20.3)	29.6 (23.4 - 36.4)	11.1 (9.4 - 13.0)
Burkina Faso	6.15 (5.69 - 6.64)	1.52 (1.33 - 1.72)	0.87 (0.76 - 1)	4.5 (3.1 - 6.3)	32.6 (25.3 - 40.1)	7.5 (5.9 - 9.5)
Burundi	5.06 (4.68 - 5.48)	1.19 (1.02 - 1.35)	0.68 (0.58 - 0.79)	4.4 (2.8 - 6.6)	29.2 (22.0 - 37.7)	4.7 (3.7 - 5.8)
Cabo Verde	10.74 (9.97 - 11.66)	2.16 (1.99 - 2.34)	1.5 (1.35 - 1.65)	10.6 (7.5 - 14.0)	29.5 (22.6 - 36.8)	5.6 (4.3 - 7.1)
Cameroon	6.44 (5.99 - 6.98)	1.7 (1.44 - 1.97)	1.07 (0.91 - 1.24)	9.5 (7.1 - 12.2)	24.8 (18.8 - 31.8)	4.4 (3.6 - 5.3)
C African Republic	6.25 (5.78 - 6.78)	1.03 (0.85 - 1.2)	0.65 (0.54 - 0.78)	6.3 (4.0 - 9.3)	31.2 (23.3 - 39.5)	5.8 (4.8 - 7.1)
Chad	5.23 (4.86 - 5.67)	1.07 (0.93 - 1.24)	0.67 (0.59 - 0.76)	4.8 (3.3 - 6.8)	32.9 (25.7 - 40.6)	5.2 (4.1 - 6.5)
Comoros	7.42 (6.87 - 8.04)	2.36 (2.09 - 2.66)	1.36 (1.18 - 1.56)	6.9 (4.7 - 9.6)	27.9 (21.3 - 35.3)	7.2 (6.0 - 8.5)
Congo, Dem. Rep.	5.8 (5.38 - 6.27)	1.25 (1.07 - 1.43)	0.7 (0.6 - 0.81)	5.6 (3.7 - 8.0)	28.5 (21.1 - 36.5)	6.3 (5.5 - 7.3)
Congo, Rep.	7.23 (6.69 - 7.82)	1.77 (1.56 - 1.99)	1.07 (0.92 - 1.23)	8.4 (5.8 - 11.5)	26.2 (19.1 - 34.3)	5.5 (4.6 - 6.7)
Cote d'Ivoire	6.74 (6.24 - 7.32)	1.53 (1.34 - 1.81)	0.99 (0.87 - 1.15)	9.0 (6.7 - 11.9)	27.2 (20.7 - 34.2)	7.3 (6.1 - 8.7)
Djibouti	6.91 (6.38 - 7.49)	2.23 (1.98 - 2.48)	1.31 (1.16 - 1.46)	12.2 (8.6 - 16.7)	26.8 (19.5 - 35.0)	11.4 (9.5 - 13.5)
Egypt, Arab Rep.	7.69 (7.09 - 8.37)	2.63 (2.29 - 2.92)	1.71 (1.53 - 1.9)	31.1 (26.7 - 35.5)	25.0 (19.8 - 30.6)	16.0 (14.4 - 17.8)
Equatorial Guinea	5.75 (5.33 - 6.23)	1.84 (1.55 - 2.1)	0.96 (0.8 - 1.11)	7.4 (4.6 - 10.8)	28.4 (20.8 - 36.9)	4.9 (4.0 - 6.0)
Eritrea	5.35 (4.96 - 5.8)	1.53 (1.32 - 1.75)	0.99 (0.84 - 1.15)	4.1 (2.6 - 6.0)	29.1 (22.3 - 36.3)	5.1 (4.0 - 6.4)
Ethiopia	4.98 (4.63 - 5.38)	1.69 (1.54 - 1.9)	0.84 (0.77 - 0.94)	3.6 (2.3 - 5.2)	30.3 (23.1 - 38.0)	3.1 (2.4 - 3.8)
Gabon	8.31 (7.71 - 9.0)	2.66 (2.34 - 3.01)	1.46 (1.26 - 1.66)	13.4 (9.5 - 18.1)	25.5 (18.4 - 33.7)	8.3 (7.0 - 9.8)
Gambia, The	6.54 (6.06 - 7.07)	1.78 (1.5 - 2.14)	1.12 (0.92 - 1.36)	8.7 (6.3 - 11.6)	29.1 (22.5 - 36.4)	8.9 (7.4 - 10.4)
Ghana	7.67 (7.11 - 8.31)	1.77 (1.56 - 1.97)	1.28 (1.1 - 1.44)	9.7 (7.5 - 12.2)	23.7 (18.7 - 29.3)	2.5 (2.0 - 3.1)
Guinea	6.43 (5.97 - 6.95)	1.47 (1.3 - 1.69)	0.91 (0.8 - 1.03)	6.6 (4.6 - 8.9)	30.3 (23.7 - 37.4)	3.8 (2.9 - 4.8)
Guinea-Bissau	6.40 (5.92 - 6.94)	1.68 (1.43 - 2)	1.12 (0.93 - 1.34)	8.2 (5.7 - 11.3)	30.3 (23.2 - 37.7)	5.8 (4.7 - 7.2)
Kenya	5.75 (5.34 - 6.23)	1.62 (1.47 - 1.8)	0.91 (0.83 - 1)	6.0 (4.3 - 8.2)	26.7 (20.2 - 34.0)	6.7 (6.5 - 7.0)
Lesotho	8.81 (8.19 - 9.54)	1.65 (1.43 - 1.89)	1.04 (0.89 - 1.22)	13.5 (10.3 - 16.9)	29.0 (22.6 - 35.6)	13.2 (11.8 - 14.8)

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

CKD and its risk factors burden (cont'd)

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)
Liberia	6.63 (6.14 - 7.18)	1.66 (1.38 - 1.95)	0.99 (0.83 - 1.16)	8.6 (6.2 - 11.4)	28.3 (22.2 - 35.2)	4.5 (3.8 - 5.4)
Libya	9.01 (8.31 - 9.79)	3.43 (3.11 - 3.8)	1.92 (1.7 - 2.17)	31.8 (26.5 - 37.4)	23.7 (18.0 - 29.8)	13.0 (11.3 - 15.0)
Madagascar	5.22 (4.81 - 5.65)	1.13 (0.98 - 1.28)	0.67 (0.57 - 0.77)	4.5 (2.9 - 6.4)	28.1 (21.4 - 35.4)	9.2 (7.6 - 11.0)
Malawi	5.9 (5.47 - 6.4)	1.5 (1.31 - 1.66)	0.79 (0.69 - 0.9)	4.7 (3.2 - 6.5)	28.9 (22.1 - 36.3)	6.1 (5.1 - 7.3)
Mali	5.67 (5.26 - 6.14)	1.15 (0.97 - 1.36)	0.76 (0.65 - 0.89)	7.1 (5.1 - 9.6)	32.6 (25.4 - 40.4)	4.9 (4.1 - 6.0)
Mauritania	7.17 (6.65 - 7.77)	2.29 (1.98 - 2.69)	1.33 (1.15 - 1.52)	11.3 (8.3 - 14.9)	31.7 (24.3 - 40.0)	8.5 (6.7 - 10.8)
Mauritius	17.63 (16.32 - 19.06)	10.36 (9.62 - 10.96)	6.85 (6.07 - 7.59)	11.5 (8.4 - 15.2)	25.0 (18.9 - 31.9)	15.8 (13.6 - 18.2)
Morocco	9.65 (8.93 - 10.46)	2.06 (1.87 - 2.27)	1.39 (1.25 - 1.53)	25.6 (20.7 - 30.9)	26.1 (20.0 - 32.9)	8.3 (6.8 - 10.0)
Mozambique	5.29 (4.9 - 5.72)	1.01 (0.87 - 1.28)	0.65 (0.56 - 0.77)	6.0 (4.1 - 8.2)	29.1 (22.2 - 36.6)	7.8 (6.5 - 9.3)
Namibia	7.86 (7.3 - 8.54)	1.47 (1.28 - 1.72)	0.81 (0.7 - 0.94)	15.0 (11.5 - 18.7)	28.5 (22.3 - 35.0)	10.4 (8.9 - 12.2)
Niger	5.0 (4.62 - 5.4)	1.03 (0.86 - 1.26)	0.66 (0.56 - 0.79)	4.7 (3.2 - 6.7)	33.4 (25.9 - 41.4)	4.0 (3.2 - 4.9)
Nigeria	6.3 (5.81 - 6.89)	0.87 (0.72 - 1.07)	0.58 (0.49 - 0.69)	7.8 (5.9 - 9.9)	23.9 (18.7 - 29.5)	2.9 (2.3 - 3.6)
Rwanda	5.86 (5.41 - 6.38)	1.68 (1.46 - 1.94)	0.9 (0.78 - 1.03)	4.8 (3.2 - 6.7)	26.7 (19.7 - 34.3)	6.3 (5.3 - 7.4)
Sao Tome & Principe	8.10 (7.51 - 8.78)	4.32 (3.91 - 4.79)	2.72 (2.42 - 3.08)	10.6 (7.7 - 14.1)	25.8 (19.7 - 33.0)	2.9 (2.3 - 3.6)
Senegal	6.93 (6.43 - 7.51)	2.2 (1.93 - 2.58)	1.33 (1.16 - 1.56)	7.4 (5.2 - 9.9)	30.2 (23.0 - 38.0)	4.4 (3.7 - 5.3)
Seychelles	12.77 (11.85 - 13.76)	5.44 (5.06 - 5.79)	3.7 (3.33 - 4.07)	14.6 (11.0 - 18.6)	23.5 (17.6 - 30.2)	15.1 (12.6 - 17.7)
Sierra Leone	6.6 (6.12 - 7.15)	1.26 (1.1 - 1.44)	0.81 (0.7 - 0.94)	7.5 (5.3 - 10.1)	30.3 (23.4 - 37.2)	10.9 (9.3 - 12.8)
Somalia	5.14 (4.76 - 5.56)	1.39 (1.2 - 1.58)	0.8 (0.69 - 0.9)	6.9 (4.5 - 9.8)	32.9 (25.2 - 41.3)	6.0 (4.9 - 7.5)
South Africa	10.71 (9.94 - 11.57)	1.93 (1.79 - 2.05)	1.13 (1.05 - 1.21)	27.0 (23.4 - 30.8)	26.9 (21.7 - 32.7)	14.6 (13.9 - 15.3)
South Sudan	5.06 (4.70 - 5.47)	1.28 (1.08 - 1.49)	0.69 (0.58 - 0.81)	-	-	6.4 (5.1 - 7.9)
Sudan	5.85 (5.43 - 6.37)	1.52 (1.36 - 1.69)	0.96 (0.85 - 1.07)	-	-	1.0 (0.7 - 1.5)
Swaziland	8.18 (7.59 - 8.83)	2.1 (1.64 - 2.41)	1.3 (1.03 - 1.52)	13.5 (10.0 - 17.5)	29.8 (23.3 - 37.0)	4.7 (4.0 - 5.5)
Tanzania	5.63 (5.22 - 6.14)	1.7 (1.49 - 1.93)	0.91 (0.8 - 1.04)	7.1 (5.3 - 9.4)	27.3 (21.4 - 33.8)	6.9 (5.9 - 8.0)
Togo	6.92 (6.38 - 7.5)	1.5 (1.3 - 1.71)	0.98 (0.84 - 1.13)	7.1 (4.9 - 9.7)	28.9 (22.4 - 35.8)	3.9 (3.2 - 4.7)
Tunisia	11.15 (10.31 - 12.23)	2.48 (2.24 - 2.77)	1.62 (1.46 - 1.78)	27.3 (22.4 - 32.1)	23.2 (17.7 - 29.0)	19.9 (17.3 - 22.7)
Uganda	4.87 (4.51 - 5.28)	1.3 (1.13 - 1.44)	0.69 (0.6 - 0.77)	4.1 (2.8 - 5.8)	27.3 (21.0 - 34.2)	5.2 (4.4 - 6.2)
Zambia	5.26 (4.88 - 5.67)	0.57 (1.37 - 1.76)	0.86 (0.75 - 0.98)	6.5 (4.6 - 8.8)	27.1 (20.8 - 34.1)	6.5 (5.2 - 8.0)
Zimbabwe	6.7 (6.22 - 7.25)	1.48 (1.31 - 1.69)	0.89 (0.78 - 1.02)	12.3 (9.4 - 15.6)	28.2 (21.6 - 35.7)	8.8 (7.9 - 9.9)

Abbreviations:

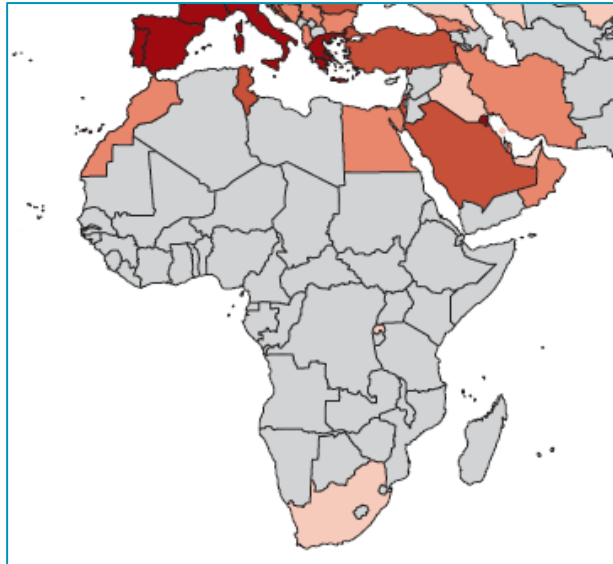
CKD (Chronic Kidney Disease),
DALYS (disability-adjusted life years),
BP (blood pressure),
CI (confidence interval)

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

Treated ESKD: all dialysis + transplant

* pmp (per million population)

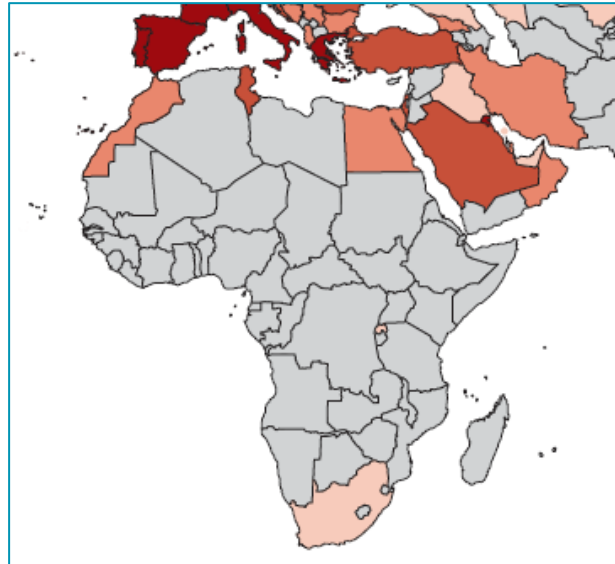
Data sources: Abu-Aisha & Elamin (Peritoneal Dialysis International) 2010, Jain et al. (JASN) 2012, Liyanage et al. (The Lancet) 2015, 2017/2018 USRDS Annual Data Report

‘ – ’: data not reported/unavailable

Country	Treated ESKD		Chronic dialysis (HD+PD)		Chronic Hemodialysis		Chronic Peritoneal dialysis	
	Incidence	Prevalence	Incidence	Prevalence	Incidence	Prevalence	Incidence	Prevalence
Algeria	-	-	-	251.4	-	240.3	-	11.1
Angola	-	-	-	23.6	-	23.6	-	0
Benin	-	-	-	30.2	-	30.2	-	0
Botswana	-	-	-	18.3	-	-	-	18.3
Burkina Faso	-	-	-	-	-	-	-	-
Burundi	-	-	-	-	-	-	-	-
Cabo Verde	-	-	-	-	-	-	-	-
Cameroon	-	-	-	23.6	-	12.2	-	0
C African Republic	-	-	-	-	-	-	-	-
Chad	-	-	-	-	-	-	-	-
Comoros	-	-	-	-	-	-	-	-
Congo, Dem. Rep.	-	-	-	0.6	-	0.34	-	0.34
Congo, Rep.	-	-	-	8.5	-	0.4	-	0.3
Cote d'Ivoire	-	-	-	23.3	-	23.3	-	0
Djibouti	-	-	-	-	-	-	-	-
Egypt, Arab Rep.	56	624	-	610	-	517.7	-	0.1
Equatorial Guinea	-	-	-	-	-	-	-	-
Eritrea	-	-	-	-	-	-	-	-
Ethiopia	-	-	-	5.8	-	5.8	-	0
Gabon	-	-	-	103	-	103	-	0
Gambia, The	-	-	-	-	-	-	-	-
Ghana	-	-	-	4.4	-	4.4	-	0
Guinea	-	-	-	-	-	-	-	-
Guinea-Bissau	-	-	-	-	-	-	-	-
Kenya	-	-	-	10.3	-	9.2	-	1.1
Lesotho	-	-	-	-	-	-	-	-

Burden of ESKD (cont'd)

Prevalence of treated ESKD



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

Treated ESKD: all dialysis + transplant

* pmp (per million population)

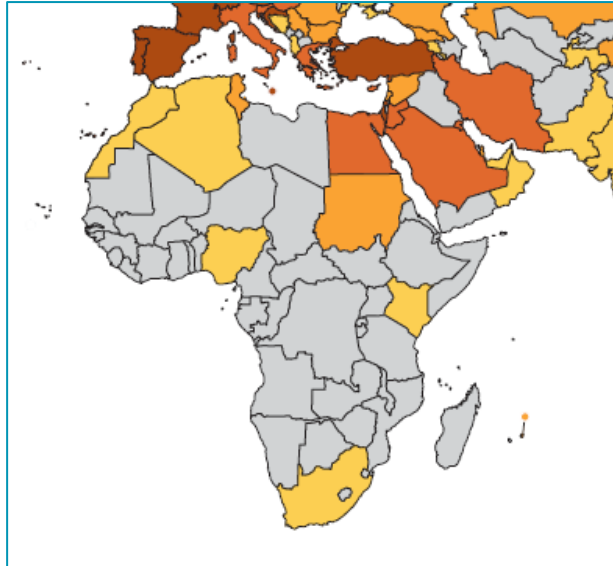
Data sources: Abu-Aisha & Elamin (Peritoneal Dialysis International) 2010, Jain et al. (JASN) 2012, Liyanage et al. (The Lancet) 2015, 2017/2018 USRDS Annual Data Report

‘—’: data not reported/unavailable

Country	Treated ESKD		Chronic dialysis (HD+PD)		Chronic Hemodialysis		Chronic Peritoneal dialysis	
	Incidence	Prevalence	Incidence	Prevalence	Incidence	Prevalence	Incidence	Prevalence
Liberia	-	-	-	-	-	-	-	-
Libya	-	-	-	360.1	-	347.1	-	8.3
Madagascar	-	-	-	5.1	-	5.1	-	0
Malawi	-	-	-	-	-	-	-	-
Mali	-	-	-	3.9	-	3.9	-	0
Mauritania	-	-	-	80.5	-	80.5	-	0
Mauritius	-	-	-	-	-	-	-	-
Morocco	144	541	-	185.6	-	185	-	0.6
Mozambique	-	-	-	0.92	-	0.92	-	0.92
Namibia	-	-	-	16.8	-	16.8	-	9.6
Niger	-	-	-	-	-	-	-	-
Nigeria	-	-	-	7.4	-	7.4	-	0
Rwanda	-	4.4	-	2.8	-	-	-	-
Sao Tome & Principe	-	-	-	-	-	-	-	-
Senegal	-	-	-	11.3	-	9.7	-	1.6
Seychelles	-	-	-	-	-	-	-	-
Sierra Leone	-	-	-	-	-	-	-	-
Somalia	-	-	-	-	-	-	-	-
South Africa	22	181	-	156	-	134.3	-	23.3
South Sudan	-	-	-	-	-	-	-	-
Sudan	-	-	-	70.4	-	67.9	-	2.5
Swaziland	-	-	-	15.4	-	15.4	-	0
Tanzania	-	-	-	0.5	-	0.5	-	0
Togo	-	-	-	8.3	-	8.3	-	0
Tunisia	239	1018	-	759.6	-	722.8	-	36.8
Uganda	-	-	-	1.2	-	1.2	-	0.66
Zambia	-	-	-	2.9	-	1.7	-	1.7
Zimbabwe	-	-	-	2.8	-	2.8	-	2.8

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

* pmp (per million population)

Data sources: GODT database

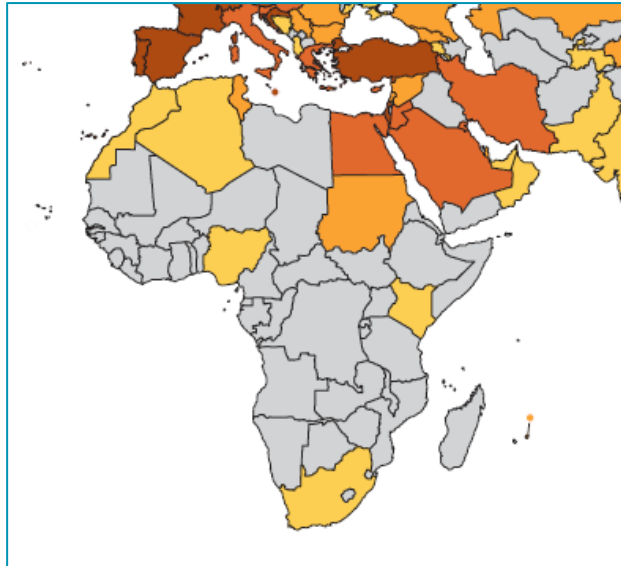
(<http://www.transplant-observatory.org/data-charts-and-tables/>)

‘—’: data not reported/unavailable

Country	Kidney transplantation				
	Incidence overall	Prevalence overall	Incidence of deceased donor	Incidence of living donor	Incidence of pre-emptive
Algeria	4.3	-	0.05	4.2	-
Angola	-	-	-	-	-
Benin	-	-	-	-	-
Botswana	-	-	-	-	-
Burkina Faso	-	-	-	-	-
Burundi	-	-	-	-	-
Cabo Verde	-	-	-	-	-
Cameroon	-	-	-	-	-
C African Republic	-	-	-	-	-
Chad	-	-	-	-	-
Comoros	-	-	-	-	-
Congo, Dem. Rep.	-	-	-	-	-
Congo, Rep.	-	-	-	-	-
Cote d'Ivoire	-	-	-	-	-
Djibouti	-	-	-	-	-
Egypt, Arab Rep.	15.5	-	0	15.5	-
Equatorial Guinea	-	-	-	-	-
Eritrea	-	-	-	-	-
Ethiopia	-	-	-	-	-
Gabon	-	-	-	-	-
Gambia, The	-	-	-	-	-
Ghana	-	-	-	-	-
Guinea	-	-	-	-	-
Guinea-Bissau	-	-	-	-	-
Kenya	0.6	-	0	0.6	-
Lesotho	-	-	-	-	-

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

* pmp (per million population)

Data sources: GODT database

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

‘ – ’ : data not reported/unavailable

Country	Kidney transplantation				
	Incidence overall	Prevalence overall	Incidence of deceased donor	Incidence of living donor	Incidence of pre-emptive
Liberia	-	-	-	-	-
Libya	-	-	-	-	-
Madagascar	-	-	-	-	-
Malawi	-	-	-	-	-
Mali	-	-	-	-	-
Mauritania	-	-	-	-	-
Mauritius	-	-	-	-	-
Morocco	1.5	-	0.6	0.9	-
Mozambique	-	-	-	-	-
Namibia	-	-	-	-	-
Niger	-	-	-	-	-
Nigeria	0.3	-	0	0.31	-
Rwanda	-	-	-	-	-
Sao Tome & Principe	-	-	-	-	-
Senegal	-	-	-	-	-
Seychelles	-	-	-	-	-
Sierra Leone	-	-	-	-	-
Somalia	-	-	-	-	-
South Africa	4.6	25.4	2.5	2.2	-
South Sudan	-	-	-	-	-
Sudan	5.3	-	0	5.3	-
Swaziland	-	-	-	-	-
Tanzania	-	-	-	-	-
Togo	-	-	-	-	-
Tunisia	11.06	-	1.6	0.9	-
Uganda	-	-	-	-	-
Zambia	-	-	-	-	-
Zimbabwe	-	-	-	-	-

Annual cost of kidney replacement therapy components

Country	Hemodialysis	Peritoneal dialysis	Kidney Transplant (First year)	Kidney Transplant (later years)	HD/PD cost ratio
Algeria	9,152	-	-	-	-
Angola	-	-	-	-	-
Benin	-	-	-	-	-
Botswana	-	-	-	-	-
Burkina Faso	-	-	-	-	-
Burundi	12,480	-	-	-	-
Cabo Verde	-	-	-	-	-
Cameroon	1,560	-	-	-	-
C African Republic					
Chad	-	-	-	-	-
Comoros	-	-	-	-	-
Congo, Dem. Rep.	43,902	34,165	-	-	1.28
Congo, Rep.	-	-	-	-	-
Cote d'Ivoire	-	-	-	-	-
Djibouti	-	-	-	-	-
Egypt, Arab Rep.	3,217	6,979	7,482	5,127	0.46
Equatorial Guinea	-	-	-	-	-
Eritrea	-	-	-	-	-
Ethiopia	-	-	-	-	-
Gabon	-	-	-	-	-
Gambia, The	-	-	-	-	-
Ghana	-	-	-	-	-
Guinea	-	-	-	-	-
Guinea-Bissau	-	-	-	-	-
Kenya	17,736	13,302	-	-	1.33
Lesotho	-	-	-	-	-
Liberia	-	-	-	-	-
Libya	-	-	-	-	-

*Cost is in \$US 2016

Abbreviations:

HD (hemodialysis),
PD (peritoneal dialysis)

Data sources: Abu Aisha & Elamin (2010),
El Matri et al. (2008), Mahmoud et al.
(2010), Soliman et al. (2012), Sumaili et al.
(2009), Tshamba et al. (2014), van der Tol
et al. (2019)

' - ' : data not reported/unavailable

Annual cost of kidney replacement therapy components (cont'd)

Country	Hemodialysis	Peritoneal dialysis	Kidney Transplant (First year)	Kidney Transplant (later years)	HD/PD ratio
Madagascar	-	-	-	-	-
Malawi	-	-	-	-	-
Mali	-	-	-	-	-
Mauritania	-	-	-	-	-
Mauritius	-	-	-	-	-
Morocco	5,282	6,812	7,357	1,500	0.78
Mozambique	-	-	-	-	-
Namibia	27,159	27,159	-	-	1
Niger	-	-	-	-	-
Nigeria	23,606	35,582	21,460	-	0.66
Rwanda	-	-	-	-	-
Sao Tome & Principe	-	-	-	-	-
Senegal	20,311	19,404	20,510	-	1.05
Seychelles	-	-	-	-	-
Sierra Leone	-	-	-	-	-
Somalia	-	-	-	-	-
South Africa	10,736	13,302	23,827	17,870	0.81
South Sudan	-	-	-	-	-
Sudan	11,639	13,202	15,680	10,879	0.88
Swaziland	-	-	-	-	-
Tanzania	28,446	-	-	-	-
Togo	-	-	-	-	-
Tunisia	5,980	5,520	17,870	8,339	1.08
Uganda	-	-	-	-	-
Zambia	-	-	-	-	-
Zimbabwe	-	-	-	-	-

*Cost is in \$US 2016

Abbreviations:

HD (hemodialysis),

PD (peritoneal dialysis)

Data sources: Abu Aisha & Elamin (2010), Elhassan et al. (2007), El Matri et al. (2008), Elsharif et al. (2010), Haddiya et al. (2012), Mushi et al. (2015), Niang et al. (2014), Okafor & Kankam (2012), van der Tol et al. (2019)

‘-’: data not reported/unavailable

Survey Response



- 42 of 54 countries in Africa (78%) responded to the 2018 survey
- This represents 96% 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
Africa															
Algeria 2017														11.38	9.10
Algeria 2019														12.00	1.92
Angola 2017															
Angola 2019														0.99	0.40
Benin 2017															
Benin 2019														0.88	0.53
Botswana 2017														0.46	0.00
Botswana 2019														0.67	0.89
Burkina Faso 2017														0.21	1.00
Burkina Faso 2019														0.66	0.86
Burundi 2017														0.19	0.09
Burundi 2019														0.17	
Cabo Verde 2017														3.66	
Cabo Verde 2019														3.52	3.52
Cameroon 2017														0.67	0.42
Cameroon 2019														0.60	0.31
Chad 2017														0.26	0.00
Chad 2019														0.19	
Congo, Dem Rep 2017														4.21	1.68
Congo, Dem Rep 2019														0.27	0.00
Congo, Republic 2017															
Congo, Republic 2019														1.58	0.00
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		

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

Country level scorecard (cont'd)

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
Cote d'Ivoire	2017													1.07	1.72
	2019													1.03	0.19
Djibouti	2017													2.41	0.00
	2019														
Egypt	2017													21.65	8.93
	2019													23.14	3.02
Eritrea	2017														
	2019														
Ethiopia	2017													0.09	0.02
	2019													0.14	0.06
Gabon	2017														
	2019													4.72	
Gambia	2017													0.51	0.51
	2019													0.48	0.48
Ghana	2017													0.38	0.11
	2019													0.28	0.14
Guinea	2017													0.34	0.93
	2019													0.51	0.67
Kenya	2017													0.50	0.28
	2019													0.62	0.08
Liberia	2017														
	2019													0.21	0.00
Libya	2017													12.48	18.72
	2019														
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	

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

Country level scorecard (cont'd)

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
Madagascar	2017															
	2019														0.19	0.23
Malawi	2017														0.06	0.11
	2019														0.00	0.00
Mali	2017														1.06	0.65
	2019															
Mauritania	2017														1.56	1.56
	2019														1.56	1.56
Morocco	2017														10.50	3.60
	2019														12.53	2.19
Mozambique	2017														0.08	0.00
	2019														0.11	0.11
Namibia	2017															
	2019														0.79	0.99
Niger	2017														0.33	0.28
	2019														0.35	0.00
Nigeria	2017														0.83	0.28
	2019														0.84	0.49
Rwanda	2017															
	2019															
Senegal	2017														0.61	0.79
	2019														2.00	4.33
Sierra Leone	2017															
	2019														0.16	0.00
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		

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

Country level scorecard (cont'd)

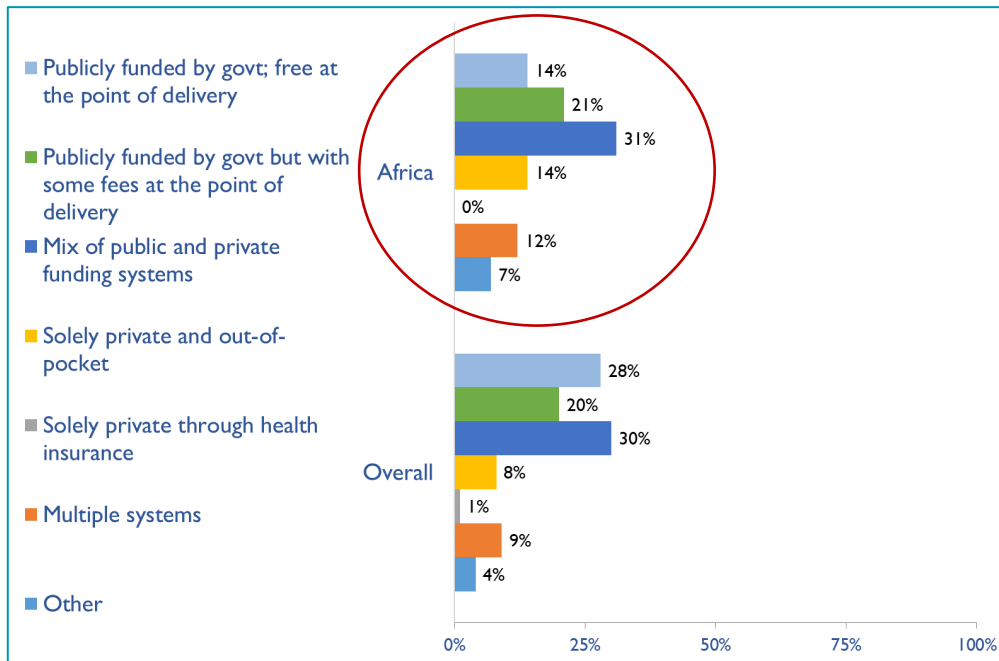
Countries	Availability of KRT and CKM				Funding for Medications		Availability and Distribution of Registry				Advocacy Group			Nephrology Workforce (PMP)	
	Chronic hemodialysis	Chronic peritoneal dialysis	Kidney transplantation	CKM	Dialysis medications	Transplant medications	CKD	Dialysis	Transplantation	AKI	CKD	AKI	ESKD/RRT	Nephrologists	Nephrologist trainees
Somalia	2017														
	2019													0.27	0.89
South Africa	2017													1.86	0.28
	2019													2.71	0.36
Sudan	2017													1.41	0.42
	2019													1.32	0.36
Swaziland	2017													0.70	0.70
	2019													0.92	0.92
Tanzania	2017													0.20	0.06
	2019													0.20	0.11
Togo	2017													0.13	0.40
	2019														
Tunisia	2017													16.31	5.44
	2019													15.63	5.51
Uganda	2017													0.11	0.05
	2019													0.24	
Zambia	2017													0.40	0.13
	2019													0.30	0.06
Zimbabwe	2017													0.39	0.00
	2019													0.36	0.00
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				

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

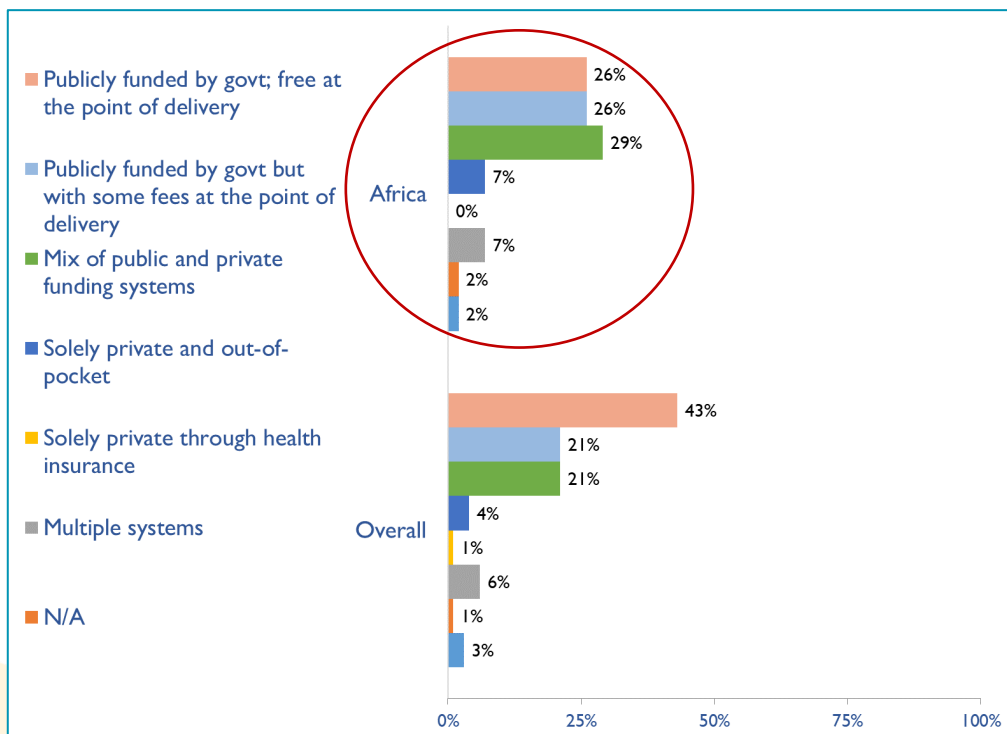
Funding for non-dialysis CKD



X : Yes

Country	Publicly funded by govt; free at the point of delivery	Publicly funded by govt but with some fees	Mix of public and private funding systems	Solely private and out-of-pocket	Solely private through health insurance	Multiple systems	Other
Algeria	X						
Angola	X						
Benin							X
Botswana			X				
Burkina Faso				X			
Burundi			X				
Cabo Verde		X					
Cameroon				X			
Chad		X					
Congo, Dem. Rep.						X	
Congo, Rep.			X				
Cote d'Ivoire		X					
Egypt, Arab Rep.			X				
Eritrea		X					
Ethiopia			X				
Gabon		X					
Gambia, The	X						
Ghana		X					
Guinea				X			
Kenya		X					
Liberia						X	
Libya			X				
Madagascar				X			
Malawi	X						
Mauritania				X			
Morocco						X	
Mozambique	X						
Namibia			X				
Niger							X
Nigeria				X			
Rwanda						X	
Senegal			X				
Sierra Leone							X
Somalia						X	
South Africa			X				
Sudan		X					
Swaziland		X					
Tanzania			X				
Tunisia			X				
Uganda			X				
Zambia	X						
Zimbabwe			X				

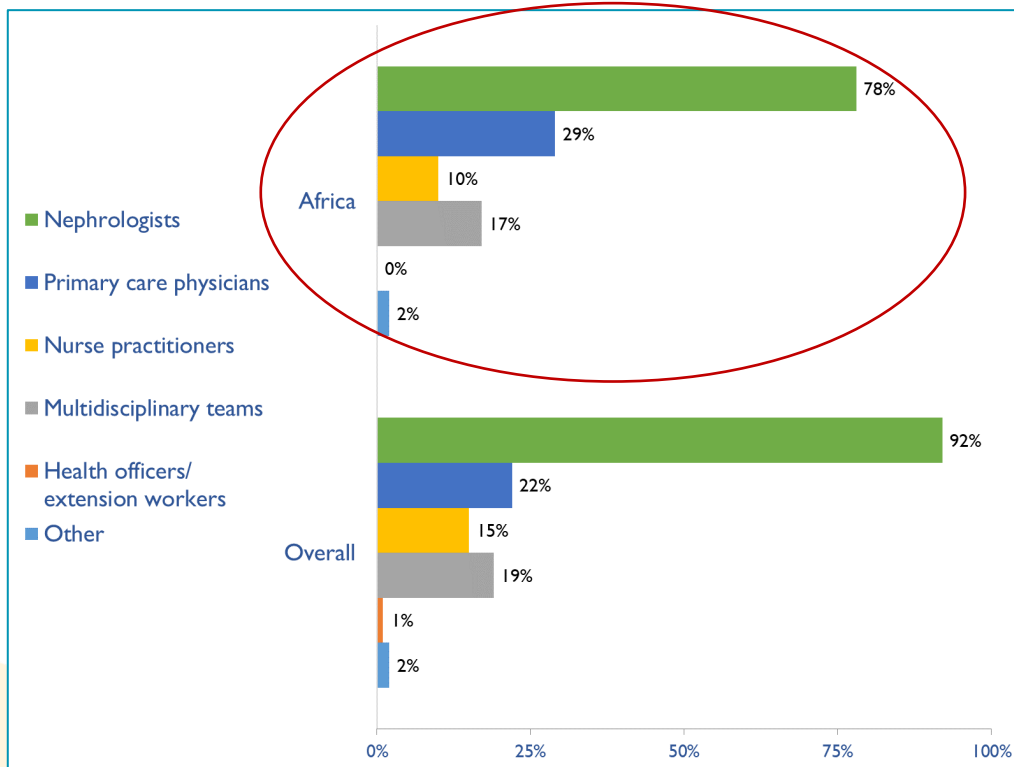
Funding for kidney replacement therapy (KRT)



Country	Publicly funded by govt; free at the point of delivery	Publicly funded by govt but with some fees	Mix of public and private funding systems	Solely private and out-of-pocket	Solely private through health insurance	Multiple systems	N/A	Other
Algeria	X							
Angola	X							
Benin	X							
Botswana			X					
Burkina Faso		X						
Burundi			X					
Cabo Verde	X							
Cameroon		X						
Chad	X							
Congo, Dem. Rep.			X					
Congo, Rep.	X							
Cote d'Ivoire			X					
Egypt, Arab Rep.	X							
Eritrea		X						
Ethiopia			X					
Gabon		X						
Gambia, The	X							
Ghana			X					
Guinea	X							
Kenya		X						
Liberia							X	
Libya			X					
Madagascar				X				
Malawi	X							
Mauritania	X							
Morocco						X		
Mozambique		X						
Namibia			X					
Niger		X						
Nigeria				X				
Rwanda						X		
Senegal		X						
Sierra Leone								X
Somalia				X				
South Africa			X					
Sudan						X		
Swaziland		X						
Tanzania			X					
Tunisia			X					
Uganda			X					
Zambia		X						
Zimbabwe		X						

X : Yes

Providers primarily responsible for ESKD care



X : Yes

Country	Nephrologists	Primary care physicians	Nurse practitioners	Multidisciplinary teams	Health officers/extension workers	Other
Algeria	X					
Angola	X	X	X			
Benin	X	X		X		
Botswana	X					
Burkina Faso	X					
Burundi	X					
Cabo Verde	X					
Cameroon	X	X				
Chad	X					
Congo, Dem. Rep.	X	X	X	X		
Congo, Rep.	X					
Cote d'Ivoire	X		X			
Egypt, Arab Rep.	X					
Eritrea						X
Ethiopia	X	X				
Gabon	X					
Gambia, The	X					
Ghana	X					
Guinea	X					
Kenya	X					
Liberia		X				
Libya	X					
Madagascar	X					
Malawi		X				
Mauritania	X	X				
Morocco	X					
Mozambique		X				
Namibia				X		
Niger	X					
Nigeria	X					
Rwanda						
Senegal	X		X			
Sierra Leone	X					
Somalia		X				
South Africa				X		
Sudan	X	X				
Swaziland				X		
Tanzania	X					
Tunisia	X			X		
Uganda	X					
Zambia				X		
Zimbabwe	X	X				

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
Algeria														
Angola														
Benin														
Botswana														
Burkina Faso														
Burundi														
Cabo Verde														
Cameroon														
Chad														
Congo, Dem. Rep.														
Congo, Rep.														
Cote d'Ivoire														
Egypt, Arab Rep.														
Eritrea														
Ethiopia														
Gabon														
Gambia, The														
Ghana														
Guinea														
Kenya														
Liberia														
Libya														

No shortage

Shortage

Shortage of ESKD care providers

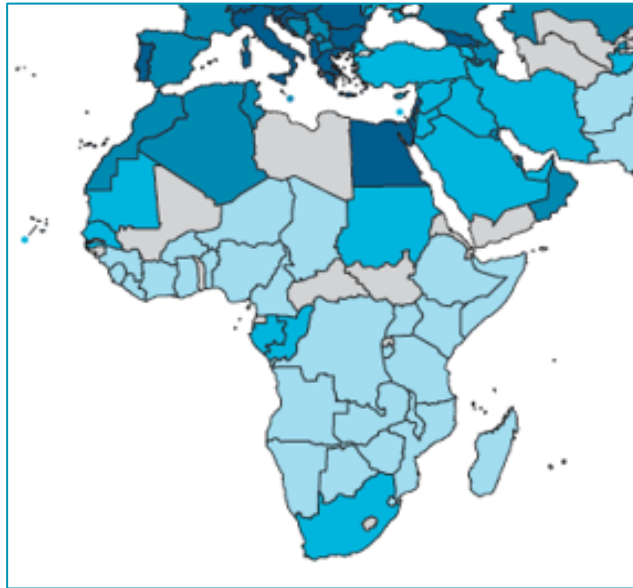
Country	Nephrologists	Transplant surgeons	Surgeons (HD access)	Surgeons (PD access)	Interventional radiologists (HD access)	Interventional radiologists (PD access)	Laboratory technicians	Dietitians	Radiologists (ultrasound)	Vascular access coordinators	Counsellors/psychologists	Transplant coordinators	Dialysis nurses	Dialysis technicians
Madagascar														
Malawi														
Mauritania														
Morocco														
Mozambique														
Namibia														
Niger														
Nigeria														
Senegal														
Sierra Leone														
Somalia														
South Africa														
Sudan														
Swaziland														
Tanzania														
Tunisia														
Uganda														
Zambia														
Zimbabwe														

No shortage

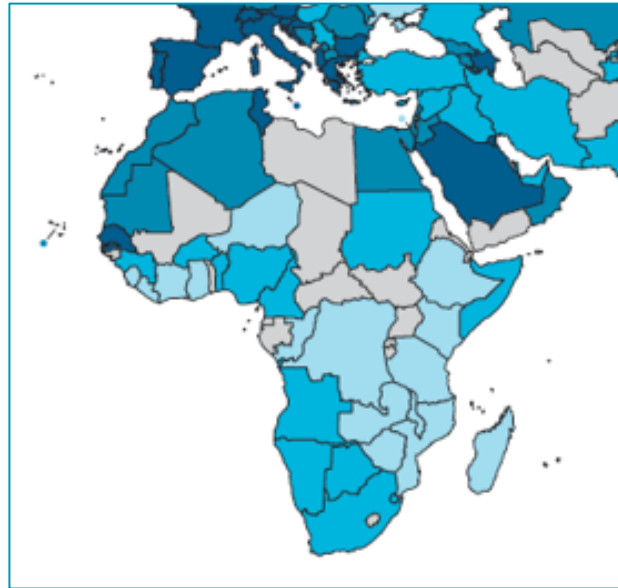
Shortage

Prevalence of nephrologists and trainees

Nephrologists



Nephrology trainees



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

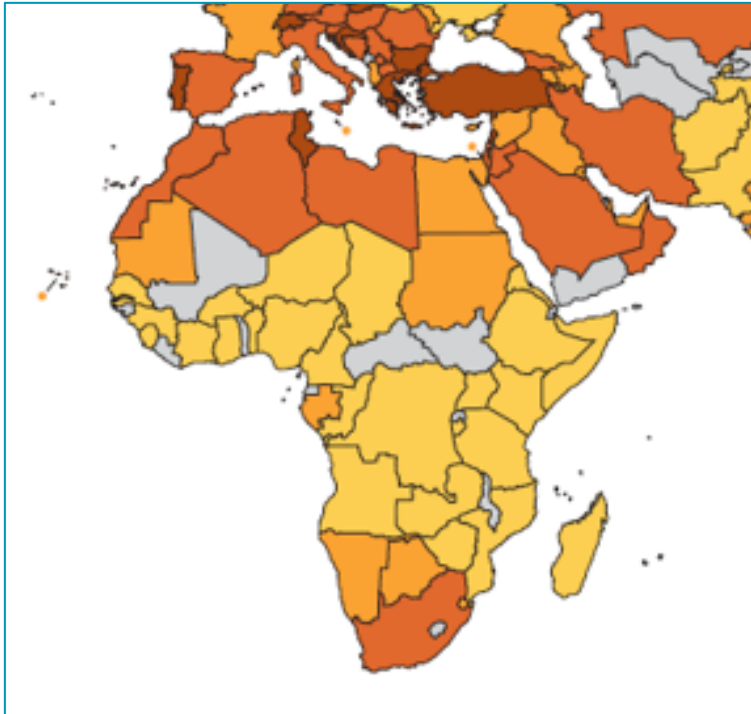
■ <0.3 pmp
 ■ 0.3–1.4 pmp
 ■ 1.5–3.7 pmp
 ■ >3.7 pmp
 ■ Data not reported

‘ – ’ : data not reported/unavailable

Country	Nephrologists PMP	Nephrology trainees PMP
Algeria	12.00	1.92
Angola	0.99	0.40
Benin	0.88	0.53
Botswana	0.67	0.89
Burkina Faso	0.66	0.86
Burundi	0.17	-
Cabo Verde	3.52	3.52
Cameroon	0.60	0.31
Chad	0.19	-
Congo, Dem. Rep.	0.27	0.00
Congo, Rep.	1.58	0.00
Cote d'Ivoire	1.03	0.19
Egypt, Arab Rep.	23.14	3.02
Eritrea	-	-
Ethiopia	0.14	0.06
Gabon	4.72	-
Gambia, The	0.48	0.48
Ghana	0.28	0.14
Guinea	0.51	0.67
Kenya	0.62	0.08
Liberia	0.21	0.00
Libya	-	-
Madagascar	0.19	0.23
Malawi	0.00	0.00
Mauritania	1.56	1.56
Morocco	12.53	2.19
Mozambique	0.11	0.11
Namibia	0.79	0.99
Niger	0.35	0.00
Nigeria	0.84	0.49
Rwanda	-	-
Senegal	2.00	4.33
Sierra Leone	0.16	0.00
Somalia	0.27	0.89
South Africa	2.71	0.36
Sudan	1.32	0.36
Swaziland	0.92	0.92
Tanzania	0.20	0.11
Tunisia	15.63	5.51
Uganda	0.24	-
Zambia	0.30	0.06
Zimbabwe	0.36	0.00

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

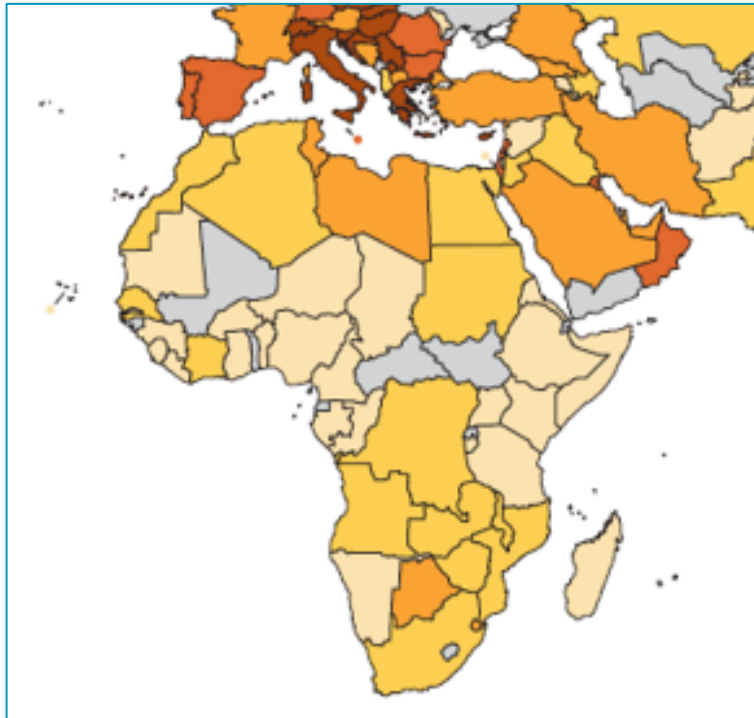
- Chronic HD services are available in all countries of the region
- The Africa average of HD treatment centers is 1.60 pmp

Country	Chronic HD Centers PMP
Algeria	7.68
Angola	0.33
Benin	0.35
Botswana	2.22
Burkina Faso	0.20
Burundi	0.17
Cabo Verde	1.76
Cameroon	0.39
Chad	0.13
Congo, Dem. Rep.	0.15
Congo, Rep.	0.99
Cote d'Ivoire	0.30
Egypt, Arab Rep.	3.02
Eritrea	0.33
Ethiopia	0.18
Gabon	2.83
Gambia, The	0.48
Ghana	0.53
Guinea	0.17
Kenya	0.83
Liberia	-
Libya	9.48
Madagascar	0.19
Malawi	-
Mauritania	4.17
Morocco	9.62
Mozambique	0.11
Namibia	1.97
Niger	0.15
Nigeria	0.73
Rwanda	-
Senegal	-
Sierra Leone	1.00
Somalia	0.32
South Africa	0.53
Sudan	4.66
Swaziland	1.72
Tanzania	2.76
Tunisia	0.34
Uganda	14.76
Zambia	0.17
Zimbabwe	0.36

‘ – ’ : data not reported/unavailable

Capacity for chronic dialysis (PD)

Chronic PD centers



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

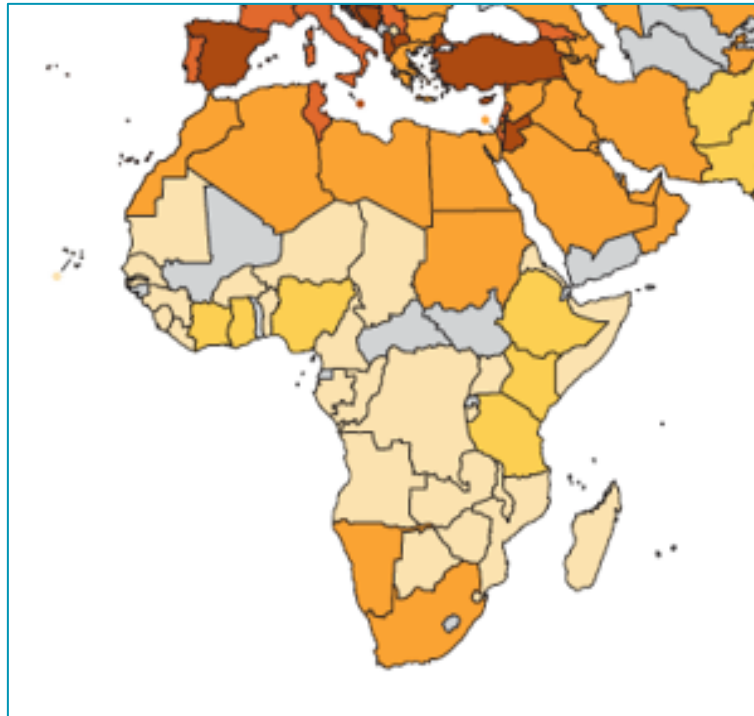
- Chronic PD services are available in 21 (51%) countries of the region
- The Africa average of PD treatment centers is 0.05 pmp

‘ – ’ : data not reported/unavailable

Country	Chronic PD Centers PMP
Algeria	0.24
Angola	0.03
Benin	-
Botswana	0.89
Burkina Faso	-
Burundi	-
Cabo Verde	-
Cameroon	-
Chad	-
Congo, Dem. Rep.	0.02
Congo, Rep.	-
Cote d'Ivoire	0.04
Egypt, Arab Rep.	0.10
Eritrea	-
Ethiopia	-
Gabon	-
Gambia, The	-
Ghana	-
Guinea	-
Kenya	-
Liberia	-
Libya	0.74
Madagascar	-
Malawi	0.05
Mauritania	-
Morocco	0.09
Mozambique	0.04
Namibia	-
Niger	-
Nigeria	-
Senegal	-
Sierra Leone	0.07
Somalia	-
South Africa	-
Sudan	0.29
Swaziland	0.09
Tanzania	0.92
Tunisia	-
Uganda	0.69
Zambia	-
Zimbabwe	0.30

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 14 (34%) countries of the region
- The Africa average of Kidney transplantation centers is 0.07 pmp

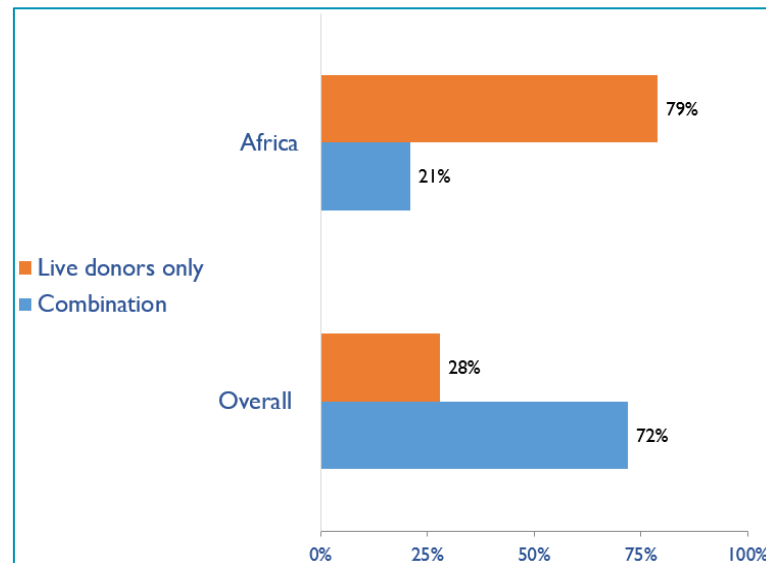
Country	Kidney Transplantation Availability	Transplant centers PMP
Algeria	X	0.17
Angola		-
Benin		-
Botswana		-
Burkina Faso		-
Burundi		-
Cabo Verde		-
Cameroon		-
Chad		-
Congo, Dem. Rep.		-
Congo, Rep.		-
Cote d'Ivoire	X	0.04
Egypt, Arab Rep.	X	0.15
Eritrea		-
Ethiopia	X	0.01
Gabon		-
Gambia, The		-
Ghana	X	0.04
Guinea		-
Kenya	X	0.10
Liberia		-
Libya	X	0.15
Madagascar		-
Malawi		-
Mauritania		-
Morocco	X	0.20
Mozambique		-
Namibia	X	0.39
Niger		-
Nigeria	X	0.10
Senegal		-
Sierra Leone		-
Somalia		-
South Africa	X	-
Sudan	X	0.18
Swaziland		0.00
Tanzania	X	0.04
Tunisia	X	0.04
Uganda		-
Zambia		-
Zimbabwe		-

‘ – ’ : data not reported/unavailable

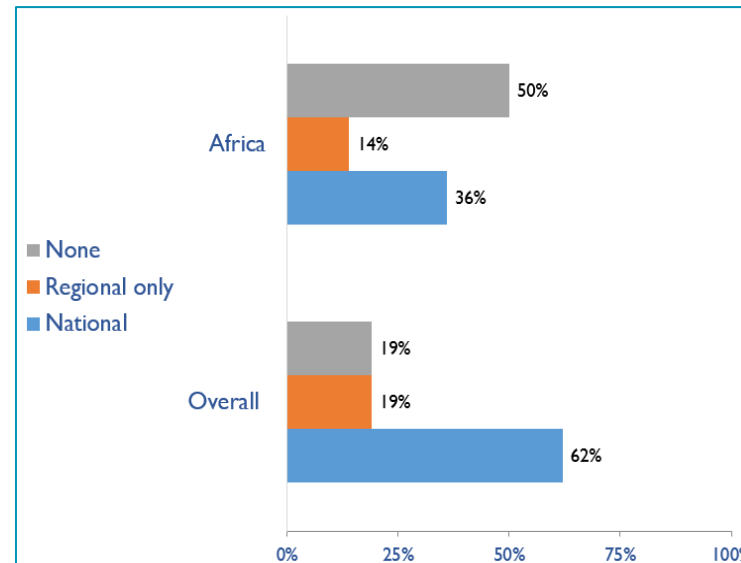
X : Yes

Capacity for Kidney Transplantation (cont'd)

Transplant donor type



Transplant waitlist

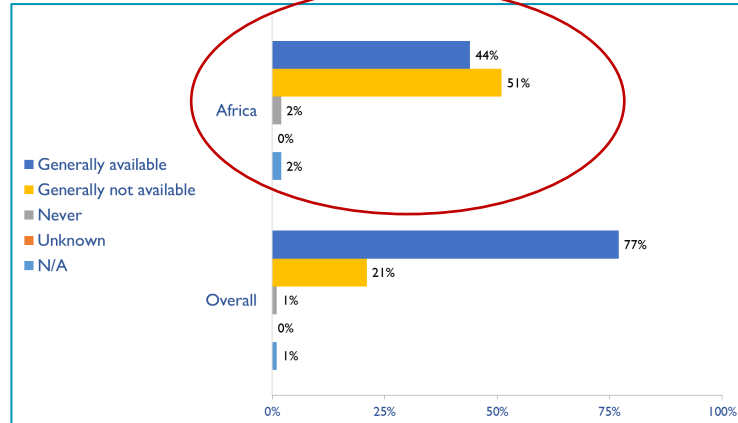


Country	Donor type		Transplant waitlist		
	Live donors only	Combination	National	Regional only	None
Algeria	X				X
Angola					
Benin					
Botswana					
Burkina Faso					
Burundi					
Cabo Verde					
Cameroon					
Chad					
Congo, Dem. Rep.					
Congo, Rep.					
Cote d'Ivoire	X				X
Egypt, Arab Rep.	X			X	
Eritrea					
Ethiopia	X				X
Gabon					
Gambia, The					
Ghana	X				X
Guinea					
Kenya	X			X	
Liberia					
Libya	X		X		
Madagascar					
Malawi					
Mauritania					
Morocco		X	X		
Mozambique					
Namibia	X		X		
Niger					
Nigeria	X				X
Senegal					
Sierra Leone					
Somalia					
South Africa		X	X		
Sudan	X				X
Swaziland					
Tanzania	X				X
Tunisia		X	X		
Uganda					
Zambia					
Zimbabwe					

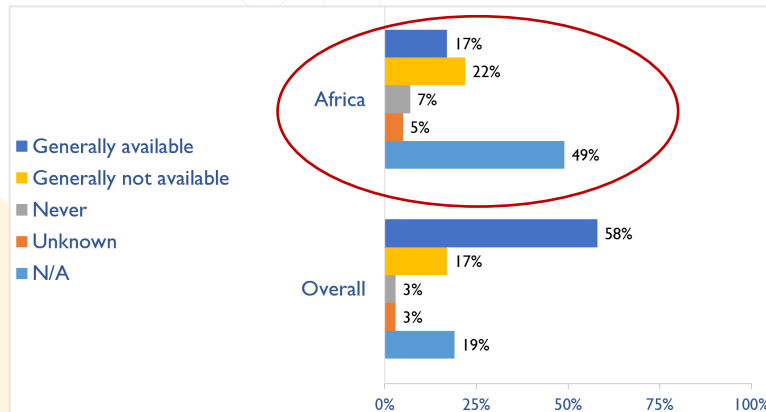
X : Yes

Availability of services within dialysis care

HD frequency



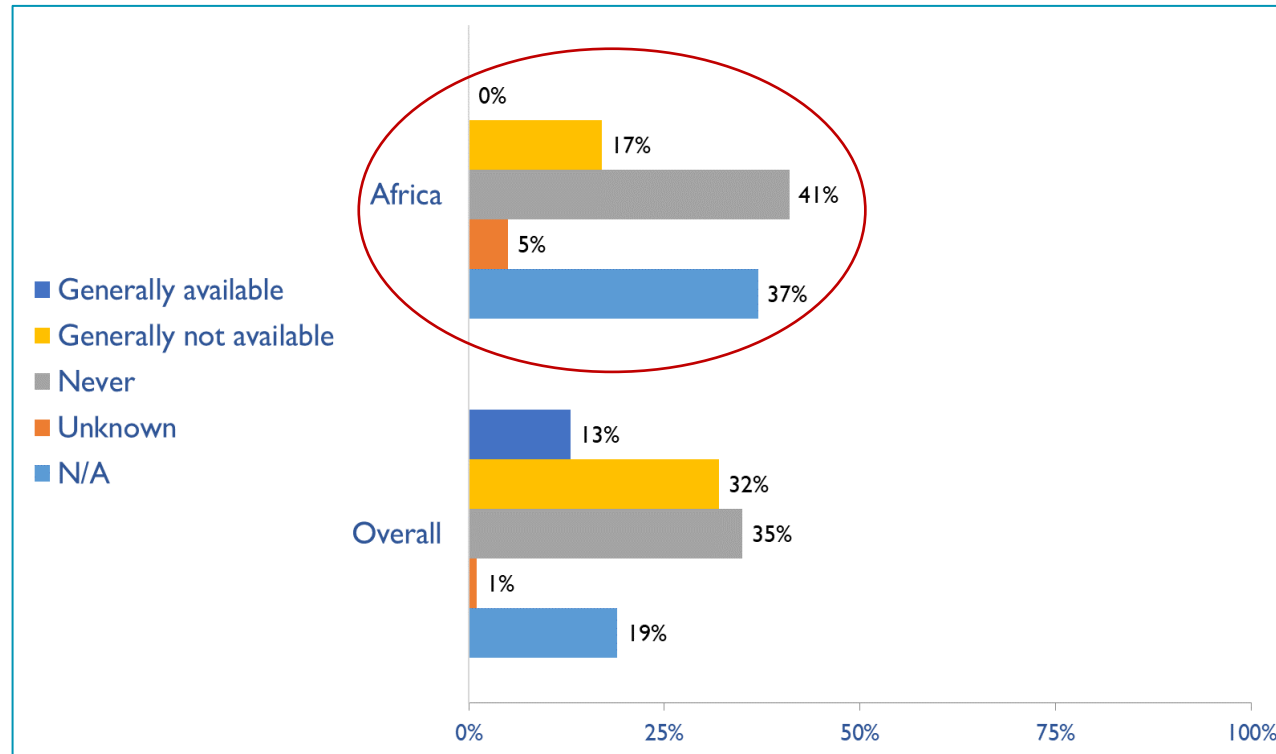
PD frequency



X : Yes

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	Generally available	Generally not available	Never	Unknown	N/A (dialysis not provided)
Algeria	X				X				
Angola	X					X			
Benin		X					X		
Botswana		X				X			
Burkina Faso		X							X
Burundi		X							X
Cabo Verde	X						X		
Cameroon		X							X
Chad		X							X
Congo, Dem. Rep.	X					X			
Congo, Rep.	X							X	
Cote d'Ivoire		X						X	
Egypt, Arab Rep.	X					X			
Eritrea		X					X		
Ethiopia		X					X		
Gabon	X								X
Gambia, The		X							X
Ghana			X						X
Guinea		X					X		
Kenya	X					X			
Liberia									X
Libya	X				X				
Madagascar	X						X		
Malawi		X				X			
Mauritania	X								X
Morocco	X				X				
Mozambique	X				X				
Namibia	X							X	
Niger		X							X
Nigeria		X				X			
Rwanda									
Senegal		X				X			
Sierra Leone		X					X		
Somalia	X								X
South Africa	X				X				
Sudan		X				X			
Swaziland		X				X			
Tanzania		X					X		
Tunisia	X				X				
Uganda		X					X		
Zambia	X				X				
Zimbabwe		X					X		

Availability of Home hemodialysis



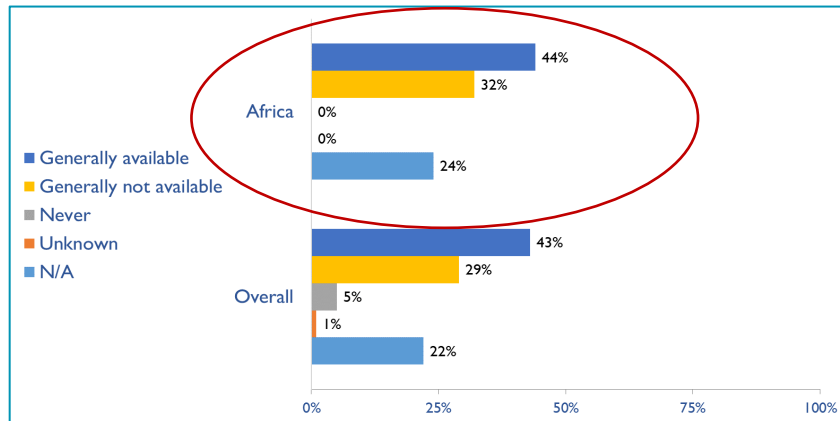
Home hemodialysis is generally not available in any country within ISN region Africa

Country	Availability of Home hemodialysis			
	Generally available	Generally not available	Home HD not available	Unknown
Algeria			X	
Angola			X	
Benin			X	
Botswana			X	
Burkina Faso			X	
Burundi			X	
Cabo Verde			X	
Cameroon			X	
Chad			X	
Congo, Dem. Rep.			X	
Congo, Rep.				X
Cote d'Ivoire			X	
Egypt, Arab Rep.			X	
Eritrea			X	
Ethiopia		X		
Gabon			X	
Gambia, The			X	
Ghana			X	
Guinea			X	
Kenya			X	
Liberia			X	
Libya			X	
Madagascar				X
Malawi			X	
Mauritania			X	
Morocco			X	
Mozambique			X	
Namibia		X		
Niger			X	
Nigeria		X		
Rwanda				
Senegal		X		
Sierra Leone			X	
Somalia			X	
South Africa		X		
Sudan		X		
Swaziland			X	
Tanzania			X	
Tunisia			X	
Uganda		X		
Zambia			X	
Zimbabwe			X	

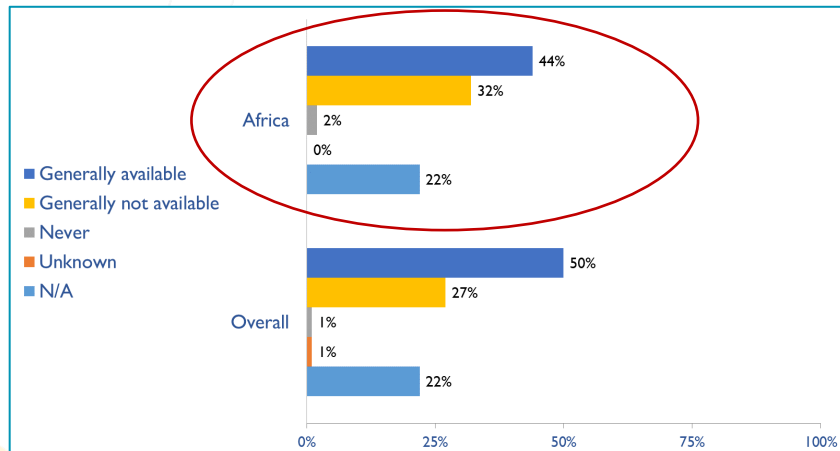
X : Yes

Capacity for conservative kidney management (CKM)

Choice–restricted CKM



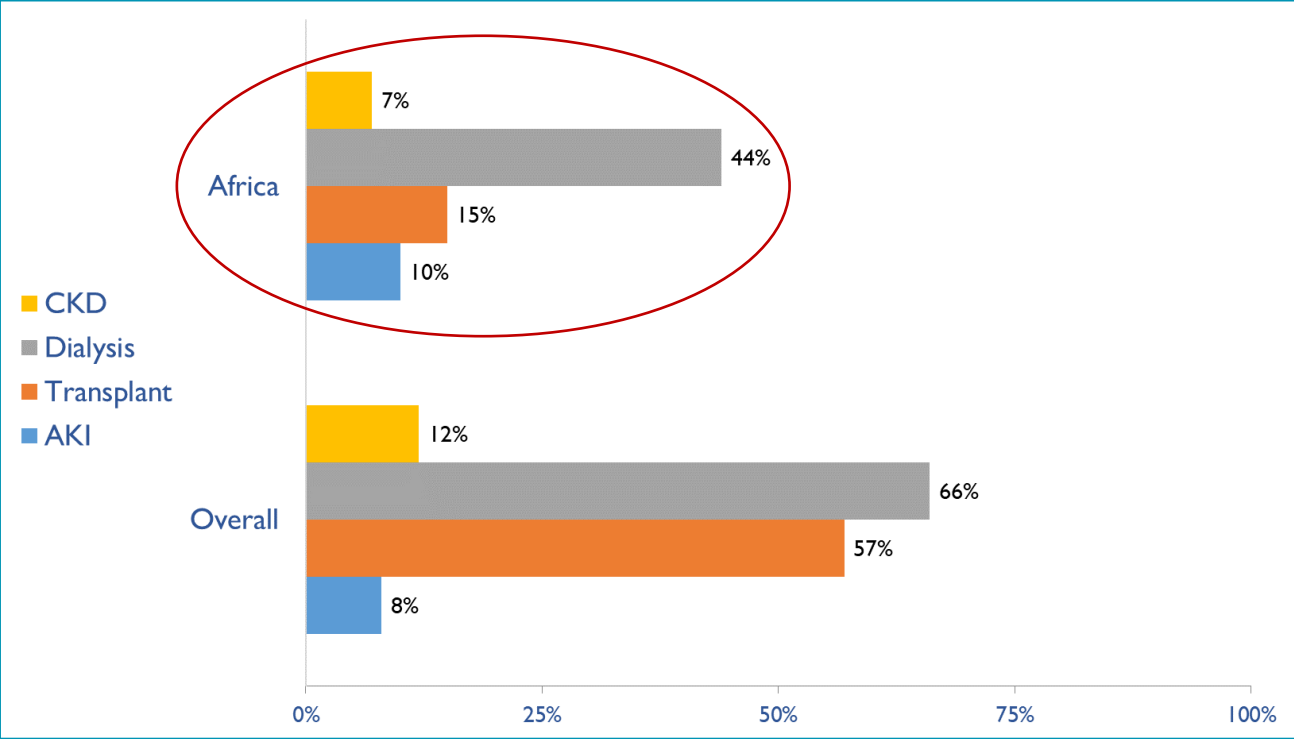
Chosen or medically advised CKM



Country	Established choice–restricted CKM					Established CKM 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)
Algeria	X					X				
Angola	X					X				
Benin		X					X			
Botswana					X					X
Burkina Faso	X						X			
Burundi		X					X			
Cabo Verde		X					X			
Cameroon	X									X
Chad		X					X			
Congo, Dem. Rep.	X					X				
Congo, Rep.	X					X				
Cote d'Ivoire					X		X			
Egypt, Arab Rep.	X					X				
Eritrea	X					X				
Ethiopia					X					X
Gabon	X					X				
Gambia, The		X						X		
Ghana	X						X			
Guinea	X					X				
Kenya	X					X				
Liberia		X					X			
Libya	X					X				
Madagascar	X					X				
Malawi		X					X			
Mauritania					X					X
Morocco	X					X				
Mozambique	X					X				
Namibia		X				X				
Niger		X					X			
Nigeria		X					X			
Rwanda										
Senegal		X					X			
Sierra Leone					X					X
Somalia					X	X				
South Africa	X					X				
Sudan					X					X
Swaziland					X					X
Tanzania					X					X
Tunisia	X					X				
Uganda		X					X			
Zambia		X				X				
Zimbabwe					X					X

X : Yes

Availability of official registry



Country	CKD	Dialysis	Transplant	AKI
Algeria		X	X	
Angola		X		
Benin				
Botswana				
Burkina Faso				
Burundi				
Cabo Verde				
Cameroon				
Chad				
Congo, Dem. Rep.				
Congo, Rep.	X	X		X
Cote d'Ivoire		X		
Egypt, Arab Rep.		X	X	
Eritrea	X	X		X
Ethiopia		X		
Gabon				
Gambia, The				
Ghana		X	X	
Guinea	X	X		X
Kenya				
Liberia				
Libya		X		
Madagascar				
Malawi				
Mauritania				
Morocco		X		
Mozambique				
Namibia		X		
Niger		X		
Nigeria		X		
Rwanda				
Senegal				
Sierra Leone				
Somalia				
South Africa		X	X	
Sudan		X		
Swaziland				
Tanzania				
Tunisia		X	X	
Uganda				
Zambia		X	X	X
Zimbabwe				

X : Yes

Summary of 2019 GKHA findings



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

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

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www.theisn.org/global-atlas