



# 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



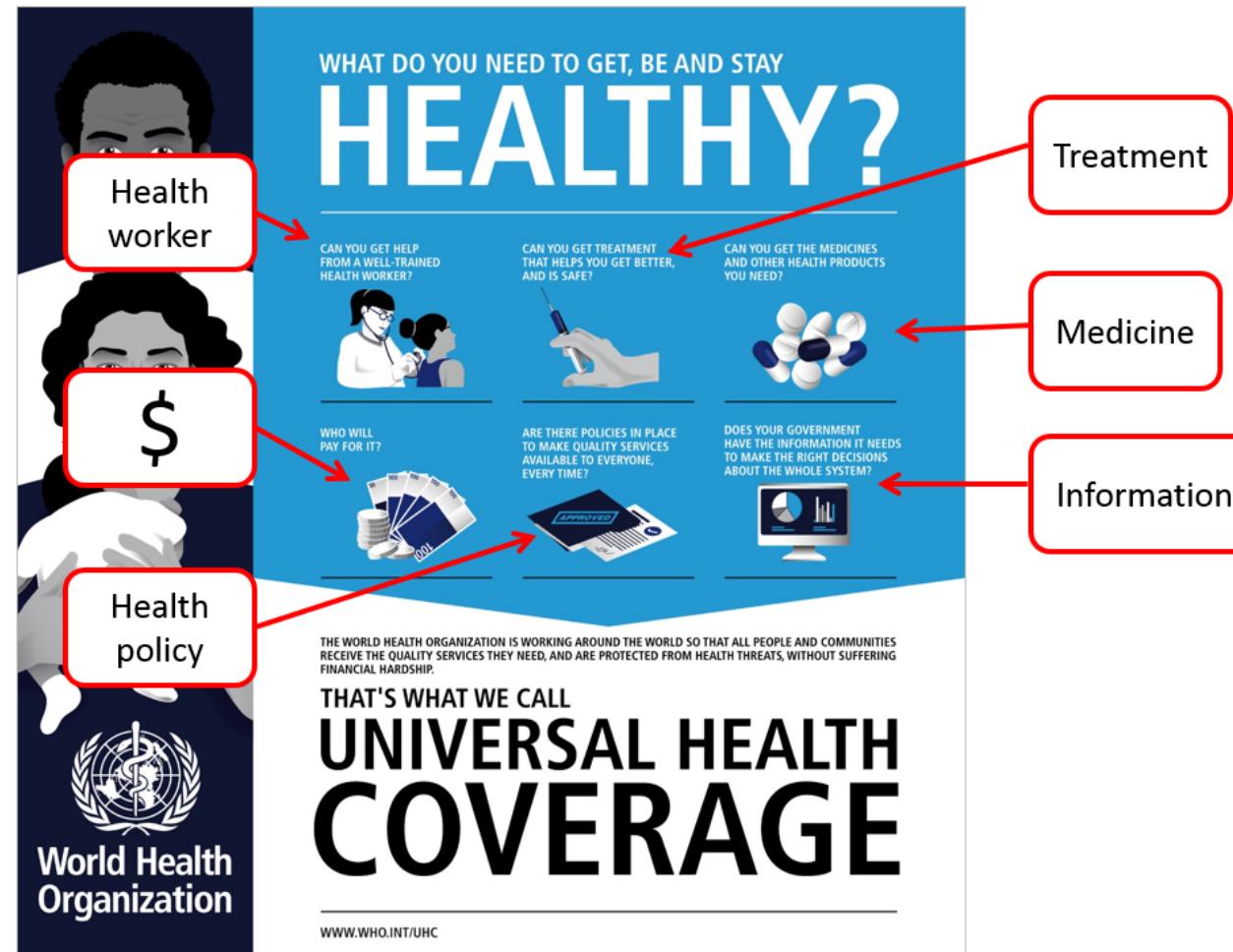
## Desk research (across countries and regions)

- 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



# Overall GKHA Response



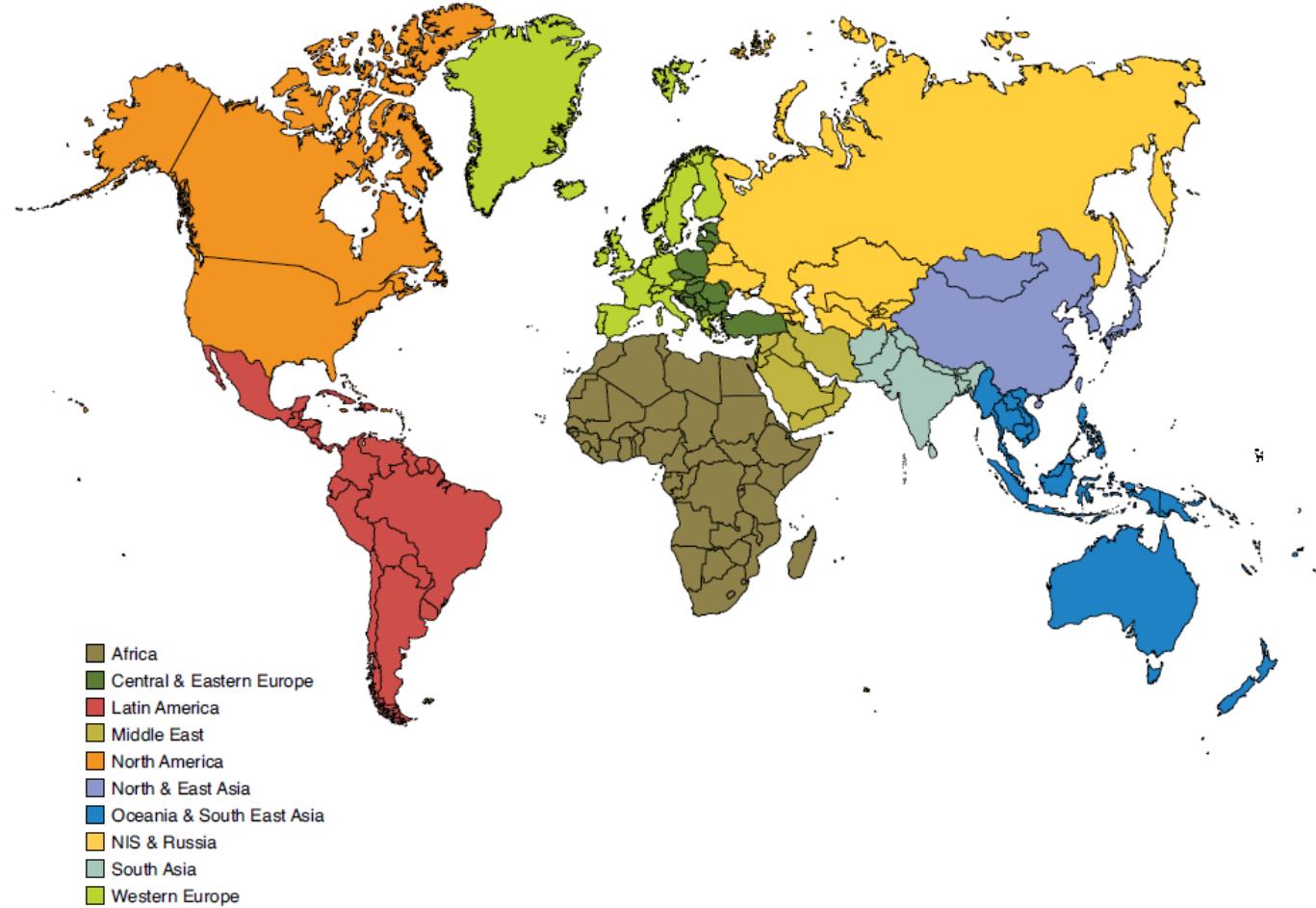
■ Participated in survey   ■ Did not participate in survey



**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: Latin America



# Demographics



'-' : data not reported/unavailable

Country	World bank ranking	Area (sq km)	Total population (2018)	GDP (PPP) (\$ billion)	Total health expenditures (% of GDP)
Argentina	Upper middle income	2,780,400	44,694,198	922.1	6.8
Belize	Upper middle income	22,966	385,854	3.218	6.1
Bolivia	Lower middle income	1,098,581	11,306,341	83.72	6.4
Brazil	Upper middle income	8,515,770	208,846,892	3248	8.9
British Virgin Islands	High income	1,910	106,977	3.872	-
Chile	High income	756,102	17,925,262	452.1	8.1
Colombia	Upper middle income	1,138,910	48,168,996	711.6	6.2
Costa Rica	Upper middle income	51,100	4,987,142	83.94	7.6
Cuba	Upper middle income	110,860	11,116,396	137	10.9
Dominica	Upper middle income	751	74,027	0.783	5.3
Dominican Republic	Upper middle income	48,670	10,298,756	173	6.2
Ecuador	Upper middle income	283,561	16,498,502	193	8.4
El Salvador	Lower middle income	21,041	6,187,271	51.17	6.9
French Guiana	-	-	-	-	-
Guadeloupe	-	-	-	-	-
Guatemala	Lower middle income	108,889	16,581,273	138.1	5.7
Guyana	Upper middle income	214,969	740,685	6.301	4.2
Haiti	Low income	27,750	10,788,440	19.97	6.9
Honduras	Lower middle income	112,090	9,182,766	46.3	8.4
Martinique	-	-	-	-	-
Mexico	Upper middle income	1,964,375	125,959,205	2463	5.9
Nicaragua	Lower middle income	130,370	6,085,213	36.4	8.7
Panama	High income	75,420	3,800,644	104.1	7.0
Paraguay	Upper middle income	406,752	7,025,763	88.91	7.8
Peru	Upper middle income	1,285,216	31,331,228	430.3	5.3
Puerto Rico	High income	13,791	3,294,626	130	-
St. Barthelemy	-	25	7,160	-	-
St. Martin	High income	54.4	32,284	0.5615	-
Suriname	Upper middle income	163,820	597,927	8.688	6.1
Uruguay	High income	176,215	3,369,299	78.16	9.2
Venezuela, RB	High income	912,050	31,689,176	381.6	3.2

# 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)
Argentina	9.33 (8.68 - 10.04)	3.26 (3.09 - 3.42)	1.99 (1.81 - 2.16)	28.5 (23.7 - 33.7)	22.6 (17.0 - 28.9)	17.7 (15.5 - 19.9)
Belize	7.57 (7.06 - 8.14)	4.51 (4.26 - 4.75)	2.76 (2.52 - 3.03)	22.4 (17.5 - 27.9)	22.7 (16.6 - 29.7)	7.1 (5.5 - 8.9)
Bolivia	6.43 (5.98 - 6.96)	4.75 (4.17 - 5.22)	2.49 (2.12 - 2.86)	18.7 (14.2 - 23.7)	17.9 (12.5 - 24.1)	19.6 (16.5 - 23.1)
Brazil	8.20 (7.61 - 8.86)	2.62 (2.57 - 2.67)	1.6 (1.49 - 1.7)	22.3 (18.9 - 25.9)	23.3 (18.1 - 28.8)	10.6 (9.8 - 11.5)
British Virgin Islands	14.44 (13.33 - 15.7)	3.81 (3.51 - 4.08)	3.02 (2.75 - 3.28)	-	-	4.1 (3.1 - 5.5)
Chile	9.34 (8.71 - 10.14)	3.76 (3.6 - 3.93)	2.05 (1.84 - 2.25)	28.8 (24.2 - 33.7)	20.9 (15.8 - 26.8)	25.6 (22.7 - 28.4)
Colombia	10.73 (9.95 - 11.68)	3.63 (3.45 - 3.8)	2.05 (1.87 - 2.22)	22.1 (18.3 - 26.2)	19.2 (14.2 - 24.7)	10.4 (8.1 - 13.0)
Costa Rica	11.43 (10.60 - 12.37)	5.37 (5.07 - 5.74)	3.1 (2.78 - 3.42)	25.7 (21.2 - 30.6)	18.7 (14.0 - 24.3)	7.8 (6.0 - 9.9)
Cuba	11.98 (11.06 - 13.02)	2.31 (2.2 - 2.41)	2.02 (1.86 - 2.19)	26.7 (21.9 - 31.7)	19.0 (13.8 - 25.3)	16.2 (13.1 - 19.6)
Dominica	12.53 (11.63 - 13.49)	4.79 (4.54 - 5.09)	3.56 (3.25 - 3.88)	28.2 (22.6 - 33.9)	22.5 (16.5 - 29.3)	3.9 (2.9 - 5.0)
Dominican Republic	8.11 (7.54 - 8.77)	3.44 (2.8 - 3.78)	2.22 (1.86 - 2.5)	26.9 (22.0 - 32.2)	21.5 (15.4 - 28.4)	6.7 (5.2 - 8.5)
Ecuador	7.58 (7.04 - 8.17)	6.57 (6.27 - 6.88)	3.26 (2.91 - 3.63)	19.3 (14.9 - 24.3)	17.9 (12.6 - 23.7)	5.0 (4.2 - 6.0)
El Salvador	10.67 (9.93 - 11.56)	9.89 (6.8 - 10.8)	6.07 (4.14 - 6.97)	22.7 (18.0 - 27.7)	18.7 (13.3 - 24.7)	6.1 (4.6 - 8.0)
French Guiana	-	-	-	-	-	-
Guadeloupe	-	-	-	-	-	-
Guatemala	8.39 (7.81 - 9.03)	5.69 (5.36 - 6.03)	3.01 (2.74 - 3.33)	18.8 (14.9 - 23.2)	21.2 (15.3 - 27.7)	7.2 (5.5 - 9.2)
Guyana	8.80 (8.18 - 9.51)	3.25 (3.03 - 3.49)	2.3 (2.1 - 2.54)	19.2 (14.5 - 24.4)	23.1 (16.7 - 30.6)	8.6 (6.9 - 10.7)
Haiti	6.29 (5.83 - 6.79)	2.35 (2.09 - 2.64)	1.47 (1.28 - 1.68)	20.5 (16.0 - 25.6)	24.5 (17.8 - 31.9)	5.2 (4.1 - 6.7)
Honduras	7.54 (7.00 - 8.15)	1.67 (1.49 - 1.83)	1.09 (0.99 - 1.2)	19.4 (15.1 - 24.1)	21.4 (15.6 - 27.9)	9.0 (7.3 - 10.9)
Martinique	-	-	-	-	-	-
Mexico	11.83 (10.99 - 12.74)	9.14 (8.89 - 9.32)	5.5 (5.05 - 5.94)	28.4 (24.7 - 32.3)	19.7 (14.8 - 25.1)	9.5 (9.1 - 10.1)
Nicaragua	9.29 (8.63 - 9.99)	9.89 (8.59 - 10.52)	5.31 (4.28 - 6.09)	21.8 (17.3 - 26.7)	20.8 (15.1 - 27.3)	8.8 (6.6 - 11.4)
Panama	10.65 (9.89 - 11.52)	5.01 (4.77 - 5.26)	2.74 (2.48 - 3.01)	22.5 (18.0 - 27.4)	19.9 (14.8 - 25.8)	3.5 (2.8 - 4.3)
Paraguay	7.31 (6.79 - 7.91)	4.9 (3.96 - 5.27)	2.64 (2.21 - 3.02)	19.0 (13.9 - 24.6)	24.6 (17.9 - 31.8)	9.9 (7.6 - 12.7)
Peru	7.14 (6.66 - 7.75)	3.73 (3.49 - 3.99)	1.9 (1.69 - 2.12)	19.1 (16.0 - 22.4)	13.7 (10.5 - 17.4)	8.1 (6.5 - 10.0)
Puerto Rico	15.39 (14.27 - 16.66)	4.9 (4.68 - 5.14)	3.27 (2.98 - 3.52)	-	-	8.8 (7.2 - 10.8)
St. Barthelemy	-	-	-	-	-	-
St. Martin	-	-	-	-	-	-
Suriname	10.03 (9.30 - 10.82)	4.87 (4.61 - 5.15)	3.16 (2.87 - 3.44)	26.5 (21.3 - 31.9)	22.4 (16.2 - 29.5)	17.7 (15.2 - 20.4)
Uruguay	10.63 (9.89 - 11.54)	2.35 (2.21 - 2.48)	1.54 (1.41 - 1.66)	28.9 (23.7 - 34.4)	20.7 (15.3 - 26.6)	18.6 (16.4 - 20.9)
Venezuela, RB	10.45 (9.66 - 11.31)	4.87 (4.63 - 5.11)	2.76 (2.51 - 3.02)	25.2 (20.9 - 29.8)	18.6 (13.7 - 24.1)	13.3 (10.6 - 16.5)

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

Data source: GBD study database  
[\(<http://www.healthdata.org/gbd>\)](http://www.healthdata.org/gbd),

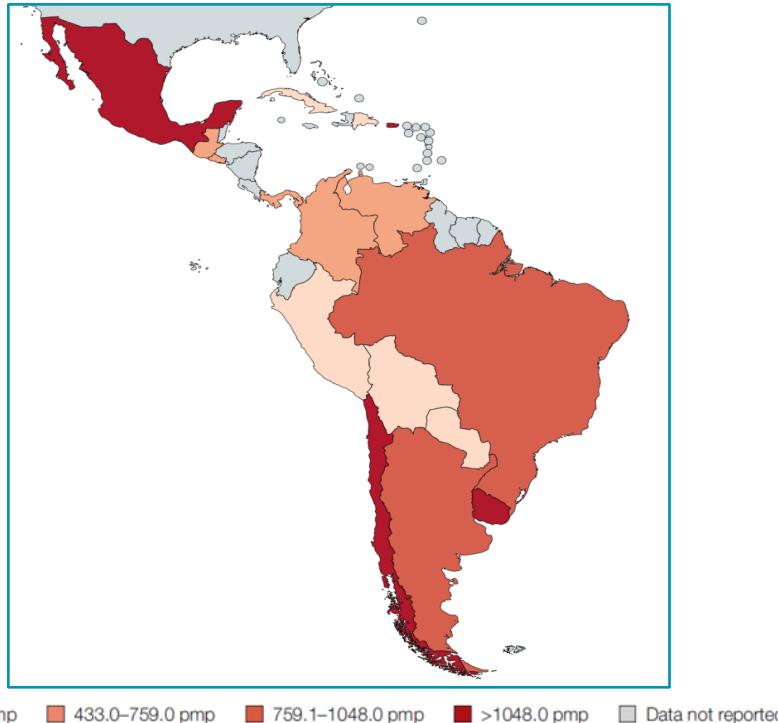
WHO data observatory (<https://www.who.int/gho/en/>)

'-' : data not reported/unavailable

# Burden of ESKD



Prevalence of treated ESKD



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 HD		Chronic PD	
	Incidence	Prevalence	Incidence	Prevalence	Incidence	Prevalence	Incidence	Prevalence
Argentina	165	872	-	664	-	626.6	-	36
Belize	-	-	-	-	-	-	-	-
Bolivia	94.8	245.1	-	213.5	-	195.2	-	18.3
Brazil	194	865	-	610	-	449.6	-	45.6
British Virgin Islands	-	-	-	1441.5	-	1399.1	-	42.4
Chile	169	1382	-	1180	-	1019.1	-	61.2
Colombia	80	672	-	543	-	349	-	143.6
Costa Rica	-	400.9	-	118.4	-	42.3	-	76
Cuba	103.1	347.6	-	269.3	-	259.1	-	10.1
Dominica	-	-	-	-	-	-	-	-
Dominican Republic	208.3	278.9	-	226.1	-	178.8	-	47.3
Ecuador	177.6	550.2	-	529.8	-	481.8	-	48
El Salvador	390.1	594.7	-	521.1	-	232.5	-	288.7
French Guiana	-	-	-	-	-	-	-	-
Guadeloupe	-	-	-	-	-	-	-	-
Guatemala	124.8	433	-	379	-	157.7	-	221.3
Guyana	-	-	-	-	-	-	-	-
Haiti	-	-	-	-	-	-	-	-
Honduras	176.7	209.6	-	201.3	-	186.9	-	14.4
Martinique	-	-	-	-	-	-	-	-
Mexico	355	1447	-	813	-	599.4	-	486.7
Nicaragua	24.4	257.1	-	235.9	-	211.5	-	24.4
Panama	462.1	696	-	585.3	-	495	-	90.3
Paraguay	20.2	189.6	-	169.7	-	165.7	-	4
Peru	30	378.5	-	315.3	-	272.2	-	43.1
Puerto Rico	432.9	1846.7	-	1468.3	-	1362.1	-	106.2
St. Barthelemy	-	-	-	-	-	-	-	-
St. Martin	-	-	-	-	-	-	-	-
Suriname	-	-	-	-	-	-	-	-
Uruguay	166	1120	-	762	-	692.2	-	71.6
Venezuela, RB	-	565.9	-	505.1	-	505.1	-	58.5

# 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: GDOT 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
Argentina	33	208	24.59	8.41	-
Belize	-	-	-	-	-
Bolivia	6.79	33	0.71	6.07	-
Brazil	28.33	255	23.43	4.9	-
British Virgin Islands	-	-	-	-	-
Chile	20.17	202	16.13	4.03	-
Colombia	17.45	128	14.63	2.83	-
Costa Rica	12.6	288.9	8.4	4.2	-
Cuba	15.04	71.2	13.91	1.13	-
Dominica	-	-	-	-	-
Dominican Republic	4.95	28.8	1.19	3.76	-
Ecuador	14.73	19.5	13.43	1.3	-
El Salvador	5.31	66.3	0	5.31	-
French Guiana	-	-	-	-	-
Guadeloupe	-	-	-	-	-
Guatemala	6.69	28.8	0.58	6.1	-
Guyana	-	-	-	-	-
Haiti	-	-	-	-	-
Honduras	1.4	3.8	0	1.4	-
Martinique	-	-	-	-	-
Mexico	23.56	634	7.46	16.09	-
Nicaragua	2.54	5.2	0.16	2.38	-
Panama	10.95	80.6	9.05	1.9	-
Paraguay	5.94	20.9	3.62	2.32	-
Peru	4.82	50	3.53	1.29	-
Puerto Rico	-	173.1	-	-	-
St. Barthelemy	-	-	-	-	-
St. Martin	-	-	-	-	-
Suriname	-	-	-	-	-
Uruguay	46	358	42.29	3.71	-
Venezuela, RB	1.23	59.1	0	1.23	-

# Annual cost of kidney replacement therapy components



Country	Hemodialysis	Peritoneal dialysis	Kidney Transplant (First year)	Kidney Transplant (later years)	HD/PD cost ratio
Argentina	15,600	18,000	21,207	-	0.87
Belize	-	-	-	-	-
Bolivia	20,701	16,732	13,784	-	1.24
Brazil	18,724	24,358	7,458	-	0.77
British Virgin Islands	-	-	-	-	-
Chile	22,758	20,524	-	-	1.11
Colombia	16,701	16,919	16,890	-	0.99
Costa Rica	-	-	-	-	-
Cuba	-	-	-	-	-
Dominica	-	-	-	-	-
Dominican Republic	-	-	-	-	-
Ecuador	-	-	-	-	-
El Salvador	-	-	-	-	-
French Guiana	-	-	-	-	-
Guadeloupe	-	-	-	-	-
Guatemala	-	-	-	-	-
Guyana	-	-	-	-	-
Haiti	-	-	-	-	-
Honduras	-	-	-	-	-
Martinique	-	-	-	-	-
Mexico	16,148	10,927	15,913	4,294	1.48
Nicaragua	-	-	-	-	-
Panama	20,721	20,075	-	-	1.03
Paraguay	14,040	15,330	-	-	0.92
Peru	10,673	13,870	-	-	0.77
Puerto Rico	-	-	-	-	-
St. Barthelemy	-	-	-	-	-
St. Martin	-	-	-	-	-
Suriname	-	-	-	-	-
Uruguay	18,207	15,277	-	-	1.19
Venezuela, RB	-	-	-	-	-

\*Cost is in \$US 2016

**Abbreviations:**

HD (hemodialysis),

PD (peritoneal dialysis)

Data source: Aimaretti & Arze (2016), Arredondo et al. (1998), Arze & Zambrana (2016), Balshaw et al. (2005), Cortes-Sanabria et al. (2013), Cueto-Manzano & Rojas-Campos (2007), de Abreu et al. (2013), Gadola et al. (2008), Hurtado et al. (2005), Neil et al. (2009), Pacheco et al. (2007), Pecoits-Filho et al. (2009), Rafael Alberto Gomez (2006), Rosselli et al. (2015), Sesso et al. (1990 & 2007), van der Tol et al. (2019), Villarreal-Rios et al. (2014)

'-' : data not reported/unavailable

# Survey response



- 18 of 31 countries in Latin America (58%) responded to the 2018 survey
- This represents 93% 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/RRRT	Nephrologists	Nephrologist trainees
<b>Latin America</b>															
Argentina	2017	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	34.54	5.76
	2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	31.32	3.36
Bolivia	2017	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	5.56	1.11
	2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9.55	3.18
Brazil	2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	20.35	2.20
	2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	19.73	2.39
British Virgin Islands	2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	0.00	0.00
	2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10.28	0.91
Chile	2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	18.13	1.39
	2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	5.56	0.43
Colombia	2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	5.19	0.42
	2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	5.19	0.42
Costa Rica	2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	5.19	0.62
	2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	5.19	0.62
Cuba	2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	38.95	20.60
	2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	14.31	3.15
Dominican Republic	2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	15.92	3.40
	2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	7.82	0.98
El Salvador	2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8.73	1.29
	2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	3.02	0.94
Guatemala	2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	4.34	0.84
	2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	3.02	0.94
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)



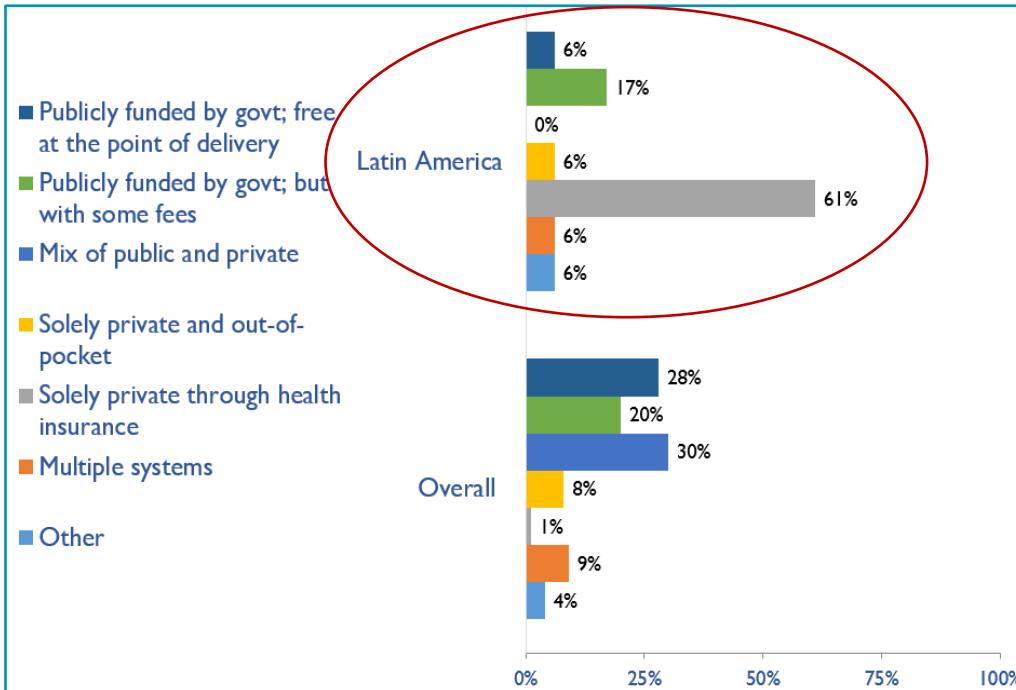
Countries	Availability of KRT and CKM				Funding for Medications			Availability and Distribution of Registry			Advocacy Group		Nephrology Workforce (PMP)		
	Chronic hemodialysis	Chronic peritoneal dialysis	Kidney transplantation	CKM	Dialysis medications	Transplant medications	CKD	Dialysis	Transplantation	AKI	CKD	AKI	ESKD/RRT	Nephrologists	Nephrologist trainees
<b>Latin America</b>															
Haiti	2017														
	2019	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	0.56	0.00
Mexico	2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8.21	1.23
	2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8.73	1.19
Nicaragua	2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	3.72	0.00
	2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Panama	2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8.75	1.09
	2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9.21	0.92
Paraguay	2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	7.96	1.18
	2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9.96	1.35
Peru	2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8.21	0.49
	2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9.26	0.77
Puerto Rico	2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
	2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	30.35	1.52
Uruguay	2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	44.88	4.79
	2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	53.42	4.45
Venezuela	2017	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	20.49	2.05
	2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	15.94	1.64
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

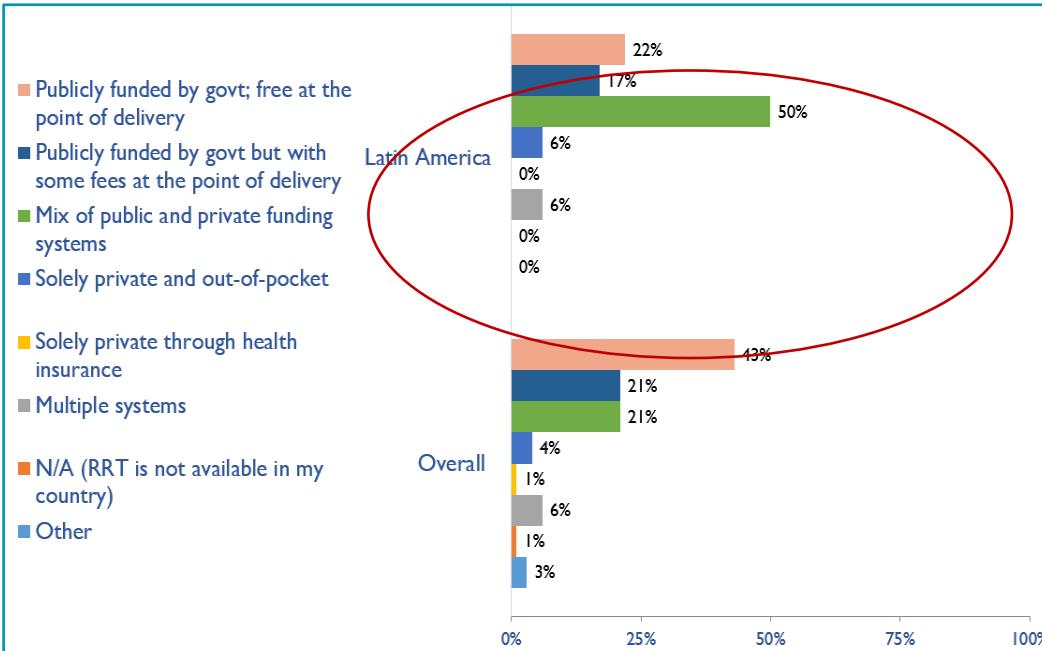
# Funding for non-dialysis CKD



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
Argentina			X				
Bolivia			X				
Brazil			X				
British Virgin Islands		X					
Chile			X				
Colombia						X	
Cuba	X						
Dominican Republic			X				
El Salvador						X	
Guatemala			X				
Haiti				X			
Mexico						X	
Panama			X				
Paraguay			X				
Peru			X				
Puerto Rico			X				
Uruguay			X				
Venezuela, RB						X	

X : Yes

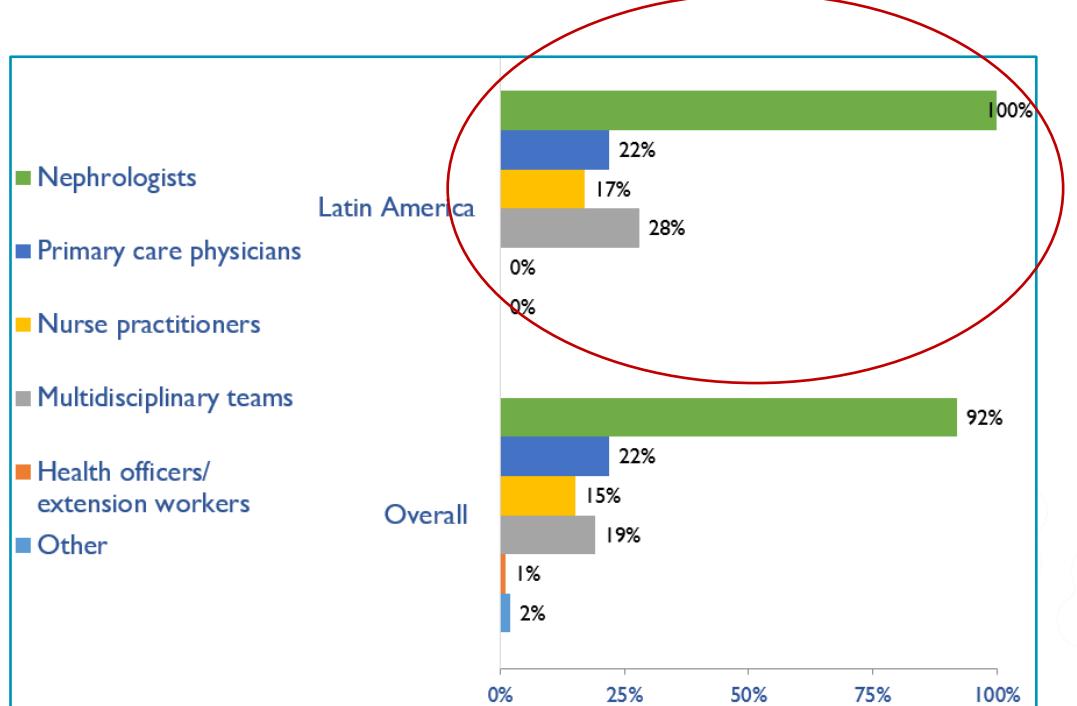
# Funding for kidney replacement therapy (KRT)



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	Other
Argentina			X					
Bolivia			X					
Brazil	X							
British Virgin Islands	X							
Chile		X						
Colombia						X		
Cuba	X							
Dominican Republic		X						
El Salvador			X					
Guatemala			X					
Haiti					X			
Mexico		X						
Panama			X					
Paraguay			X					
Peru			X					
Puerto Rico			X					
Uruguay			X					
Venezuela, RB	X							

X : Yes

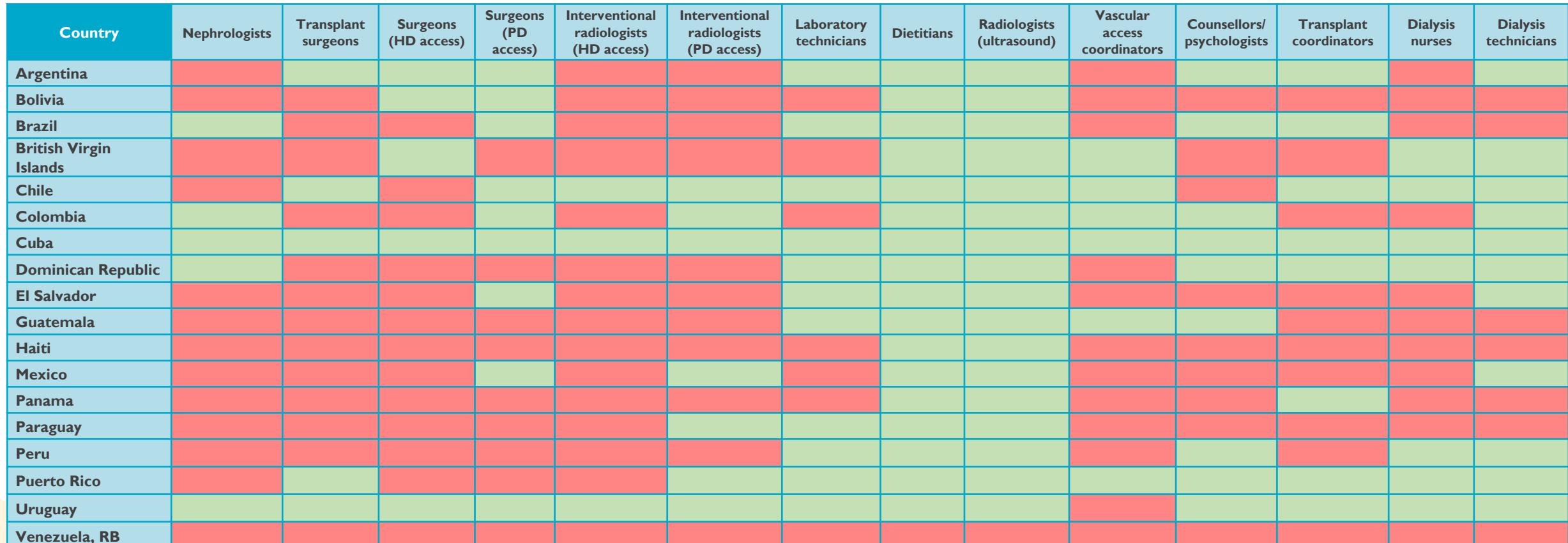
# Providers primarily responsible for ESKD care



Country	Nephrologists	Primary care physicians	Nurse practitioners or specialized nurses	Multidisciplinary teams	Health officers/extension workers	Other
Argentina	X		X	X		
Bolivia	X					
Brazil	X					
British Virgin Islands	X	X	X	X		
Chile	X					
Colombia	X					
Cuba	X	X		X		
Dominican Republic	X					
El Salvador	X					
Guatemala	X					
Haiti	X					
Mexico	X	X	X	X		
Panama	X					
Paraguay	X			X		
Peru	X					
Puerto Rico	X	X				
Uruguay	X					
Venezuela, RB	X					

X : Yes

# Shortage of ESKD care providers



No shortage

Shortage

# Prevalence of nephrologists and trainees



Nephrologists



Nephrology trainees



Country	Nephrologists PMP	Nephrology trainees PMP
Argentina	31.32	3.36
Bolivia	9.55	3.18
Brazil	19.73	2.39
British Virgin Islands	0.00	0.00
Chile	18.13	1.39
Colombia	5.19	0.42
Cuba	38.95	20.60
Dominican Republic	15.92	3.40
El Salvador	8.73	1.29
Guatemala	4.34	0.84
Haiti	0.56	0.00
Mexico	8.73	1.19
Panama	9.21	0.92
Paraguay	9.96	1.35
Peru	9.26	0.77
Puerto Rico	30.35	1.52
Uruguay	53.42	4.45
Venezuela, RB	15.94	1.64

'-' : data not reported/unavailable

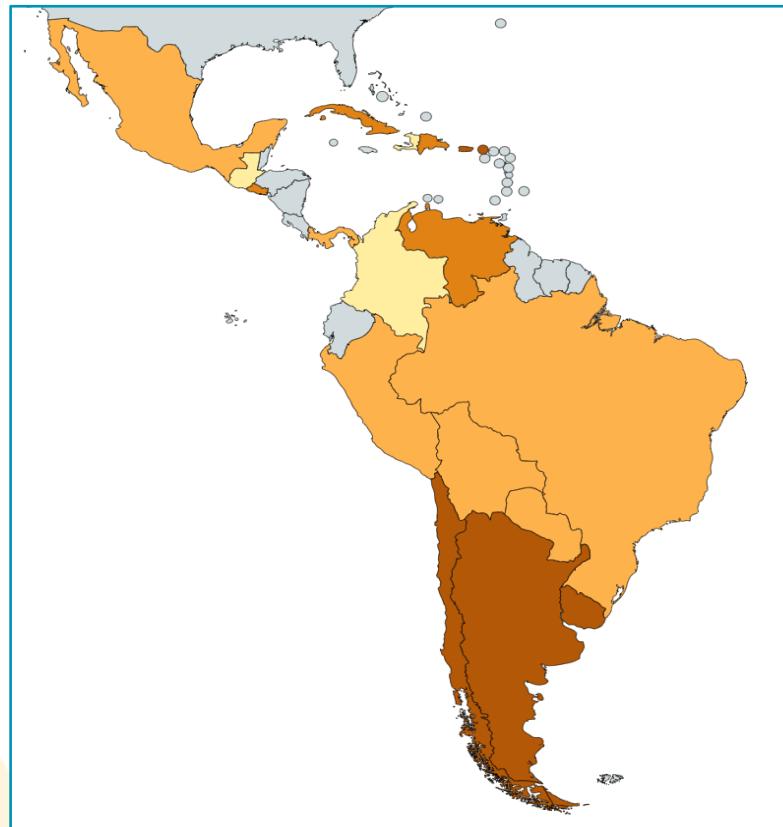
<1.2 pmp    1.2–10.0 pmp    10.1–22.9 pmp    >22.9 pmp    Data not reported

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

# Capacity for chronic dialysis (HD)



Chronic HD centers



- Chronic HD services are available in all countries of the region
- The Latin America average of HD treatment centers is **4.6 pmp**

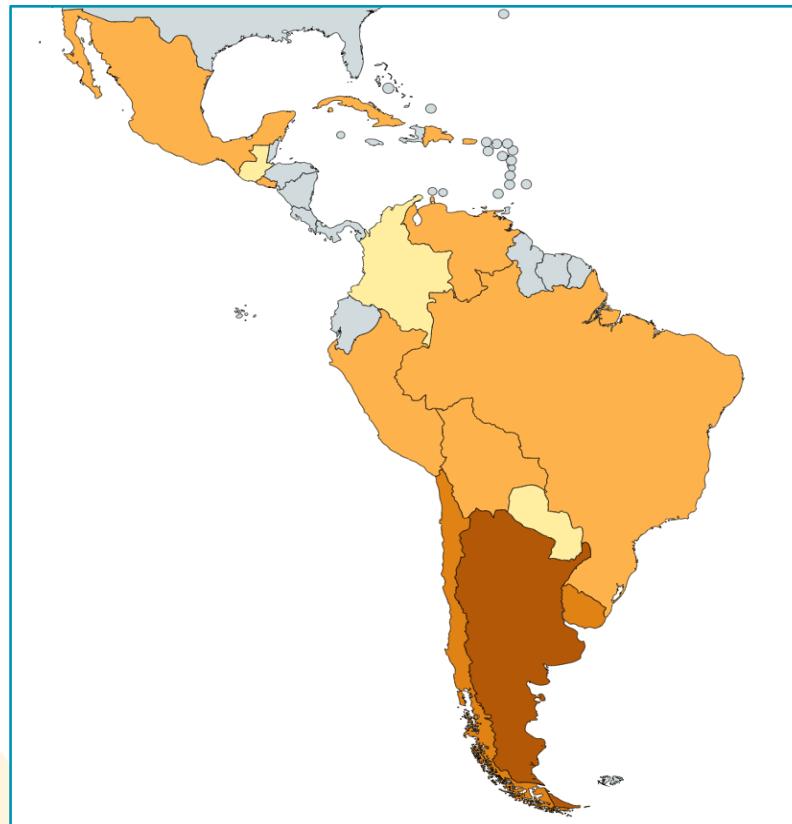
Country	Chronic HD Centres PMP
Argentina	10.87
Bolivia	4.25
Brazil	3.61
British Virgin Islands	27.93
Chile	12.64
Colombia	1.04
Cuba	5.04
Dominican Republic	8.74
El Salvador	4.85
Guatemala	0.90
Haiti	0.65
Mexico	2.48
Panama	4.47
Paraguay	3.70
Peru	2.87
Puerto Rico	16.39
Uruguay	11.28
Venezuela, RB	4.64

'-' : data not reported/unavailable

# Capacity for chronic dialysis (PD)



Chronic PD centers



- Chronic PD services are available in 16 (89%) countries of the region
- The Latin America average of PD treatment centers is 0.96 pmp

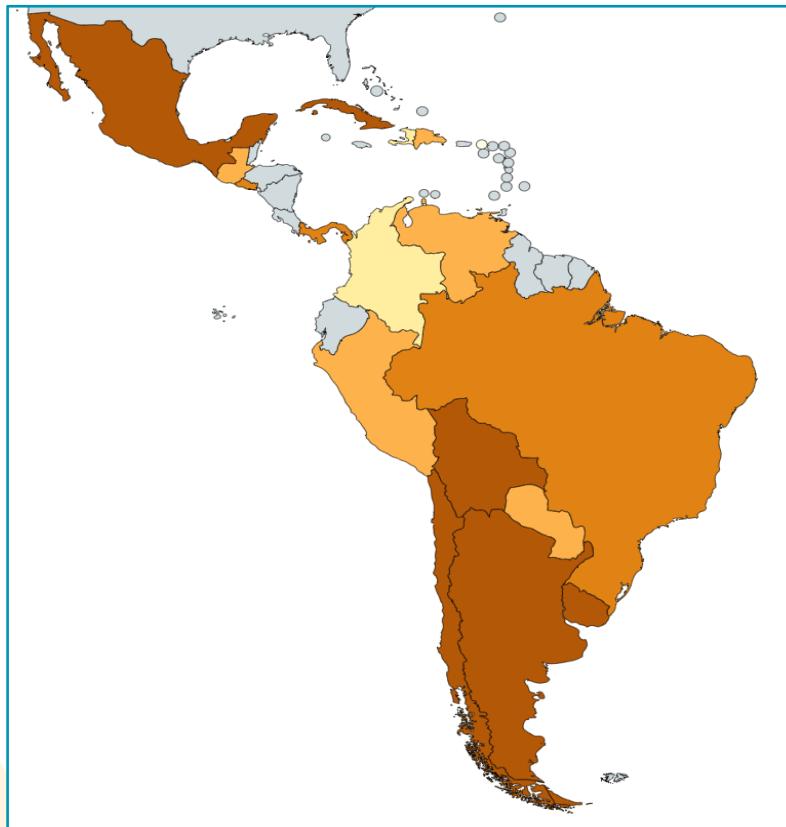
Country	Chronic PD Centres PMP
Argentina	4.47
Bolivia	0.44
Brazil	0.72
British Virgin Islands	-
Chile	2.09
Colombia	0.21
Cuba	0.90
Dominican Republic	0.78
El Salvador	1.13
Guatemala	0.12
Haiti	-
Mexico	1.21
Panama	1.84
Paraguay	0.28
Peru	1.02
Puerto Rico	1.21
Uruguay	2.37
Venezuela, RB	0.54

'-' : data not reported/unavailable

# Capacity for kidney transplantation



## Kidney transplantation centers



- Kidney transplantation services are available in 17 (94%) countries of the region
- The Latin America average of Kidney transplantation centers is 0.51 pmp

Country	Kidney Transplantation availability	Transplant centers PMP
Argentina	X	1.28
Bolivia	X	0.88
Brazil	X	0.48
British Virgin Islands		-
Chile	X	0.84
Colombia	X	0.17
Cuba	X	0.81
Dominican Republic	X	0.39
El Salvador	X	0.65
Guatemala	X	0.24
Haiti	X	0.00
Mexico	X	1.36
Panama	X	0.53
Paraguay	X	0.36
Peru	X	0.38
Puerto Rico	X	-
Uruguay	X	0.89
Venezuela, RB	X	0.25

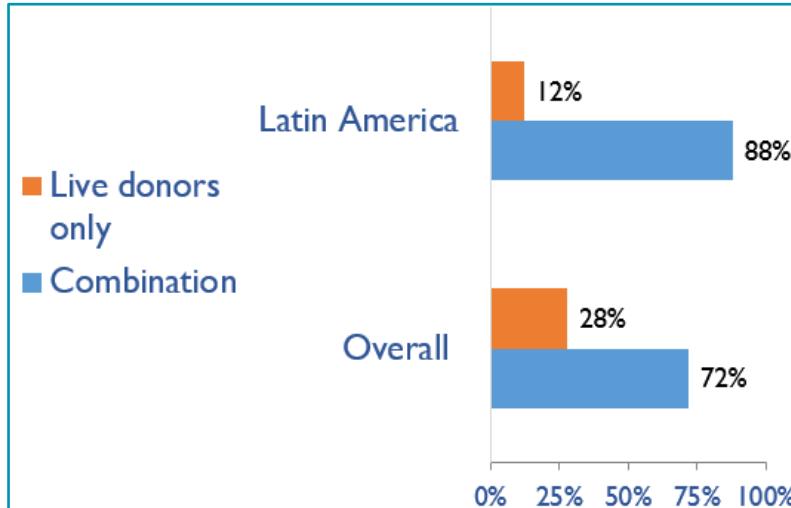
X : Yes

' - ' : data not reported/unavailable

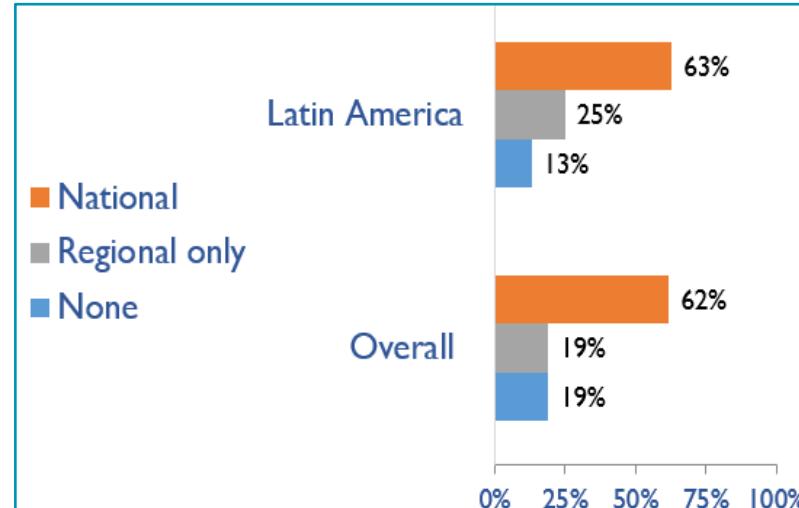
Legend:  
Kidney transplantation not provided  
<0.2 pmp  
0.2–0.4 pmp  
0.5–0.7 pmp  
>0.7 pmp  
Data not reported

# Capacity for kidney transplantation (cont'd)

Transplant donor type



Transplant waitlist

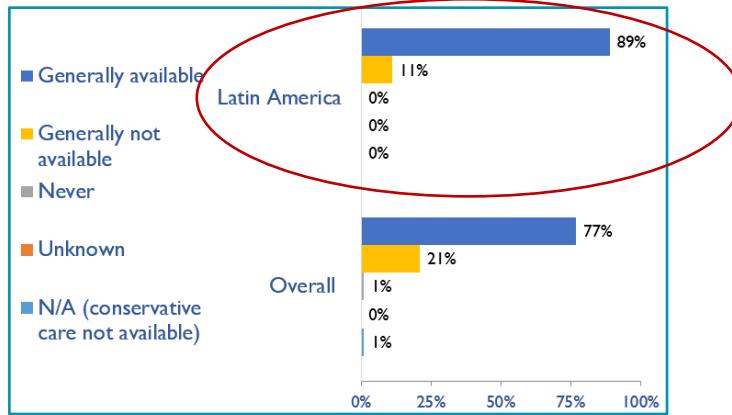


Country	Donor type		Transplant waitlist		
	Live donors only	Combination	National	Regional only	None
Argentina			X	X	
Bolivia			X		X
Brazil			X	X	
British Virgin Islands					
Chile			X	X	
Colombia			X		X
Cuba			X	X	
Dominican Republic			X		X
El Salvador	X				X
Guatemala		X		X	
Haiti	X				X
Mexico			X	X	
Panama			X	X	
Paraguay			X	X	
Peru			X	X	
Puerto Rico			X		
Uruguay			X	X	
Venezuela, RB			X	X	

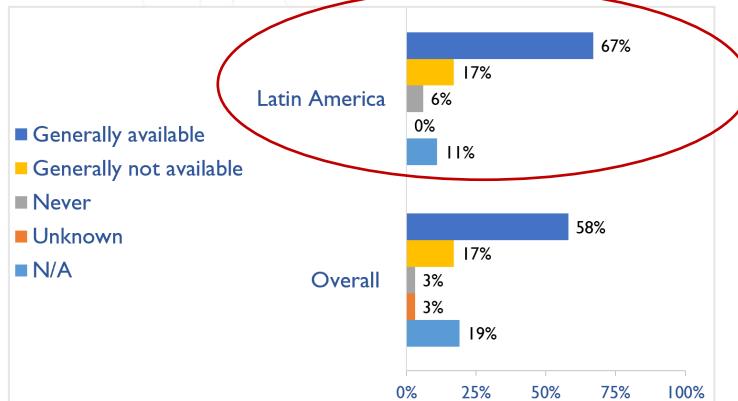
X : Yes

# Availability of services within dialysis care

## HD frequency



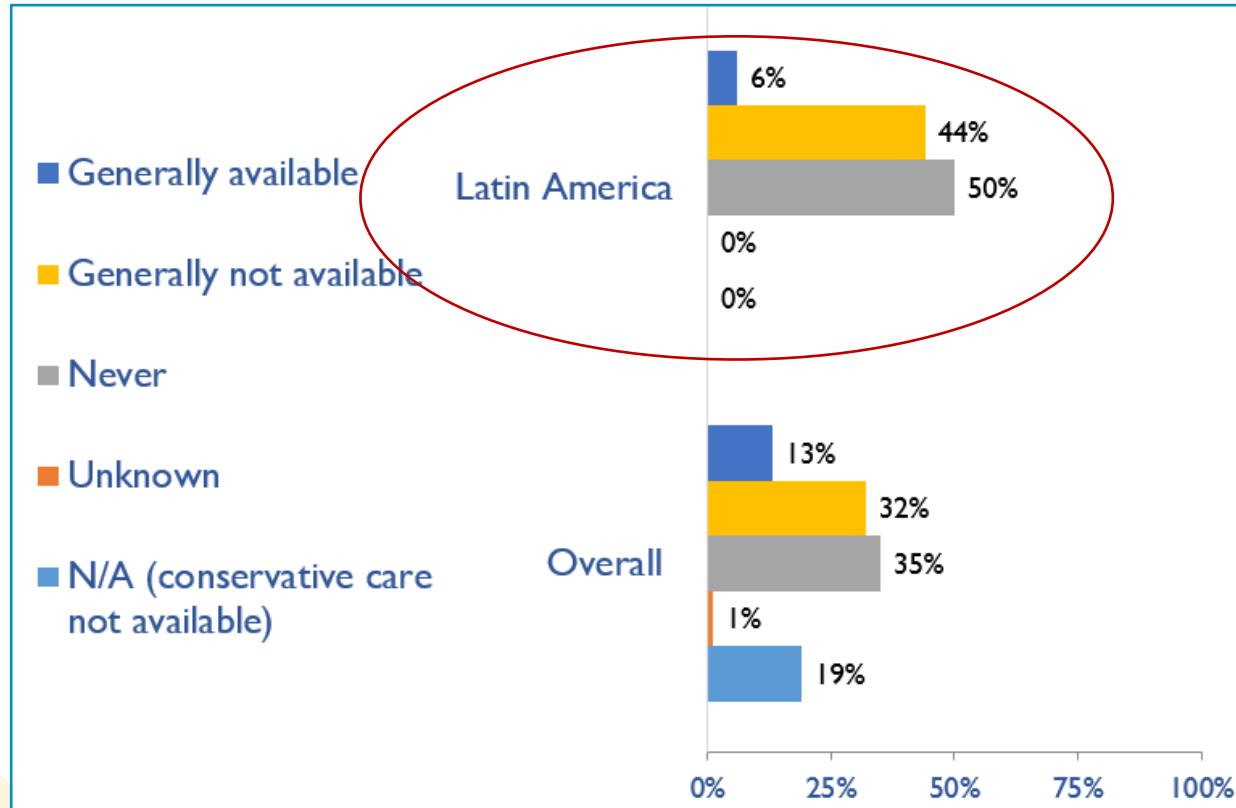
## PD frequency



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	Generally available	Generally not available	Never	Unknown
Argentina		X				X		
Bolivia	X						X	
Brazil	X				X			
British Virgin Islands	X							X
Chile	X				X			
Colombia	X					X		
Cuba	X				X			
Dominican Republic	X				X			
El Salvador		X			X			
Guatemala	X				X			
Haiti	X							X
Mexico	X				X			
Panama	X				X			
Paraguay	X					X		
Peru	X				X			
Puerto Rico	X				X			
Uruguay	X				X			
Venezuela, RB	X				X			

X : Yes

# Availability of home hemodialysis



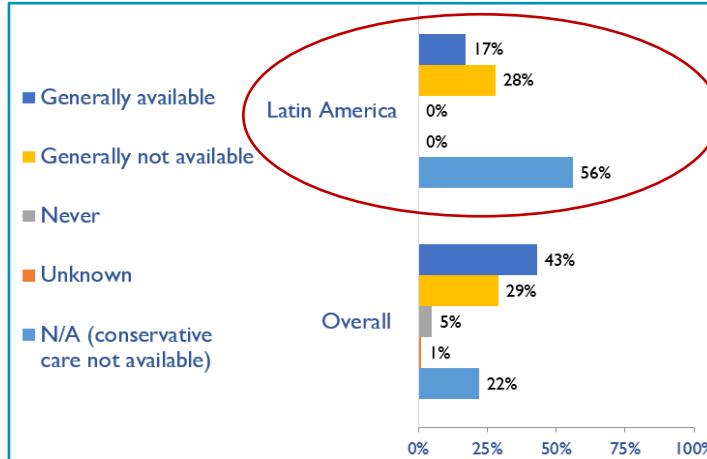
Country	Availability of Home hemodialysis				
	Generally available	Generally not available	Never	Unknown	N/A (dialysis not provided)
Argentina		X			
Bolivia			X		
Brazil		X			
British Virgin Islands			X		
Chile		X			
Colombia			X		
Cuba			X		
Dominican Republic			X		
El Salvador			X		
Guatemala		X			
Haiti			X		
Mexico		X			
Panama		X			
Paraguay			X		
Peru		X			
Puerto Rico	X				
Uruguay			X		
Venezuela, RB		X			

X : Yes

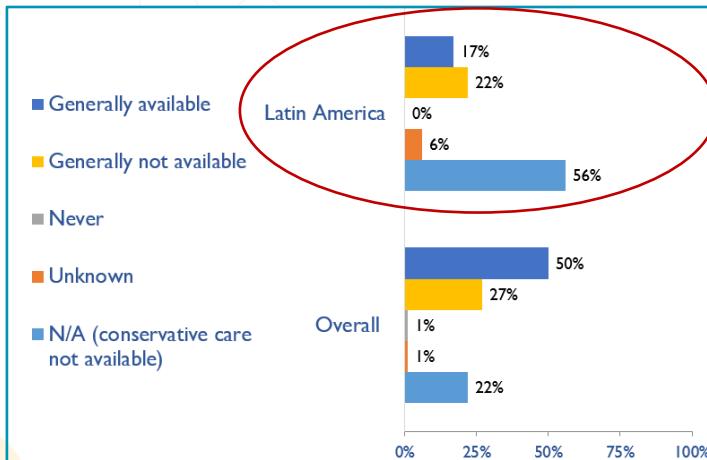
# Capacity for conservative kidney management (CKM)



## Choice-restricted CKM



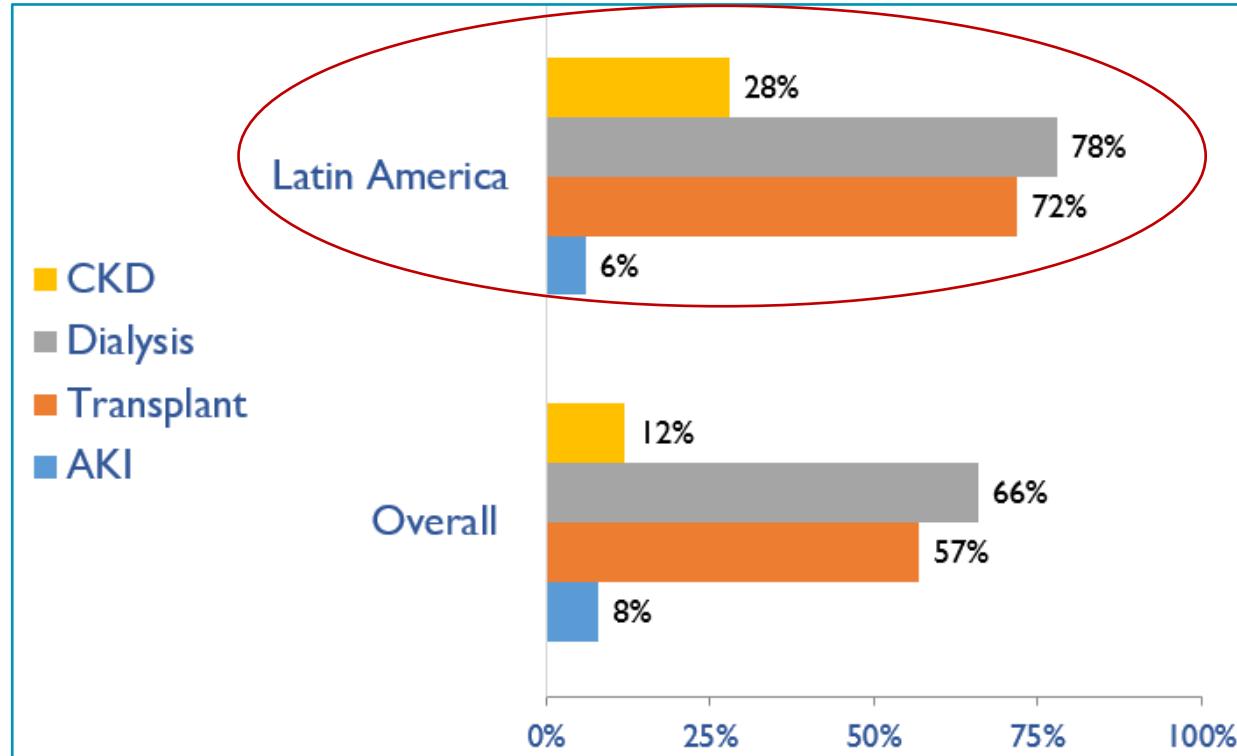
## Chosen or medically advised CKM



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)
Argentina	X					X				
Bolivia						X				X
Brazil						X				X
British Virgin Islands	X						X			
Chile						X				X
Colombia		X					X			
Cuba		X					X			
Dominican Republic		X					X			
El Salvador					X					X
Guatemala					X					X
Haiti		X							X	
Mexico					X					X
Panama		X					X			
Paraguay	X						X			
Peru					X					X
Puerto Rico					X					X
Uruguay					X					X
Venezuela, RB					X					X

X : Yes

# Availability of official registry



Country	CKD	Dialysis	Transplant	AKI
Argentina	X	X	X	
Bolivia	X	X	X	
Brazil		X	X	
British Virgin Islands		X	X	X
Chile		X	X	
Colombia	X	X	X	
Cuba		X	X	
Dominican Republic		X	X	
El Salvador				
Guatemala		X		
Haiti				
Mexico			X	
Panama		X	X	
Paraguay		X	X	
Peru				
Puerto Rico	X	X	X	
Uruguay	X	X	X	
Venezuela, RB		X		

X : Yes

# Summary of 2019 GKHA findings



- Most countries in the region offer hemodialysis, peritoneal dialysis, and kidney transplantation
- Home hemodialysis is uncommon in Latin America and the Caribbean
- Availability of conservative kidney management is low in the region
- Government funding for kidney care is low; particularly for non-dialysis CKD services
- Most countries in the region have registries for CKD and transplant
- Many workforce limitations, especially nephrologists
- Little advocacy for kidney disease in Latin America and the Caribbean

# 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:



[www.theisn.org/global-atlas](http://www.theisn.org/global-atlas)