

# THE GLOBAL KIDNEY HEALTH ATLAS



<Congress title>

Date

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

# Overview

- **Aim**
- **Methods**
- **Key Results**
- **Implications**

# Aim of the Global Kidney Health Atlas

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**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

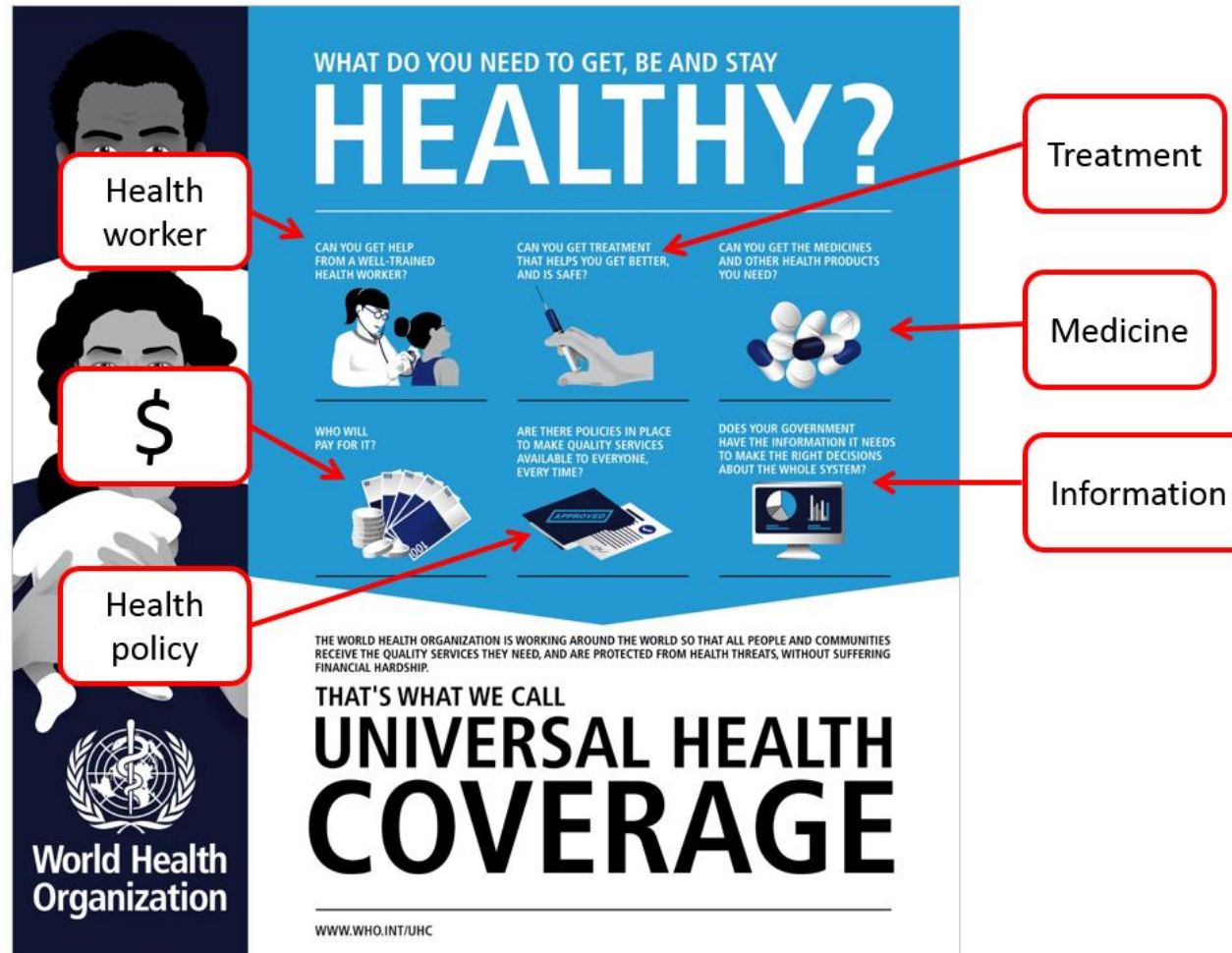
## Desk research (across countries and regions)

- 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

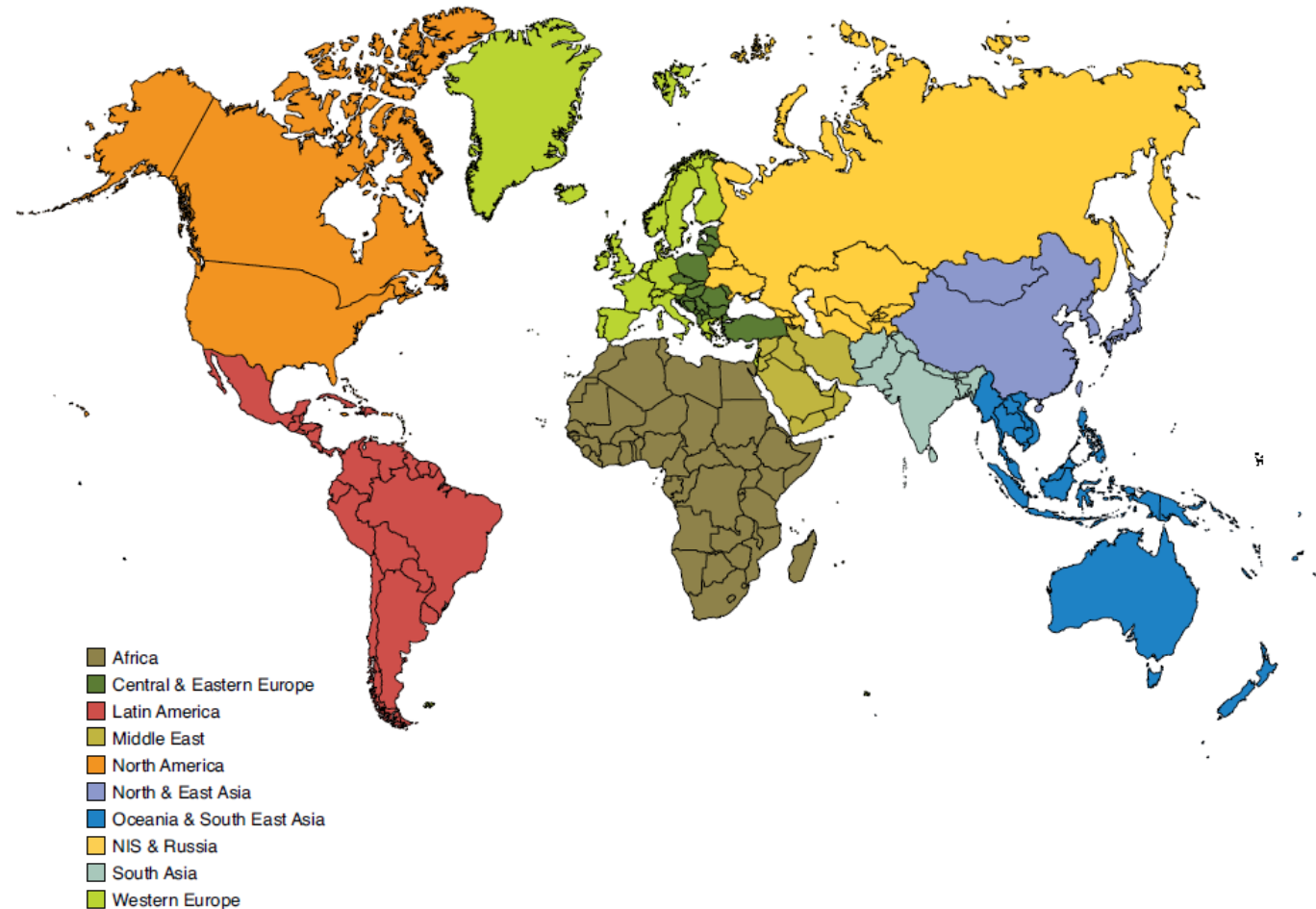
■ Participated in survey   ■ Did not participate in survey



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

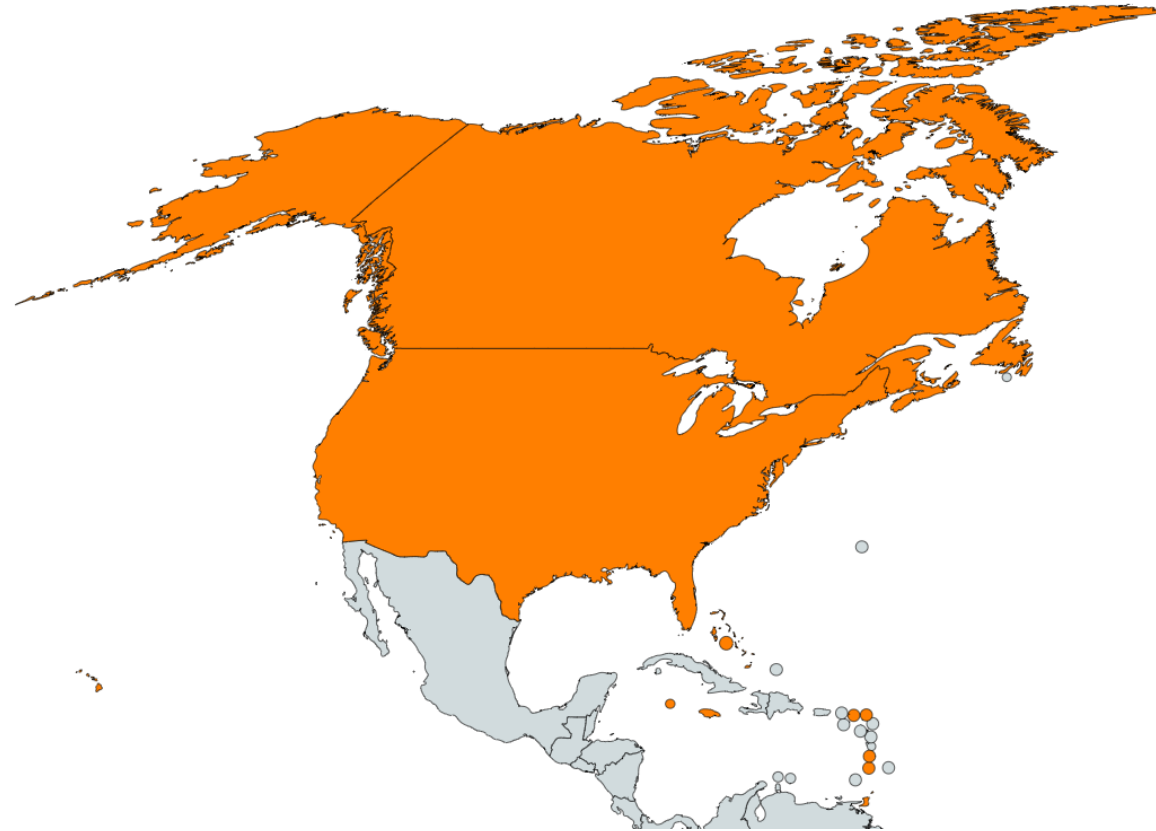
113 countries participated  
in both GKHA surveys

# Results presented by ISN regions



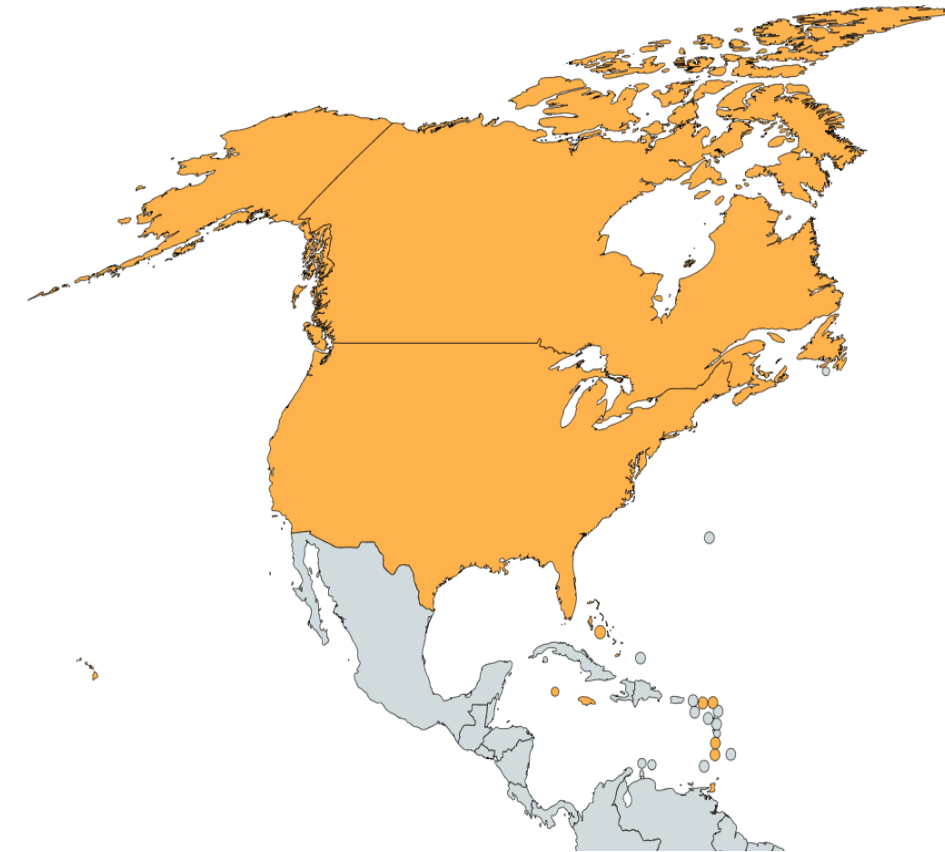


# ISN Region: North America and the Caribbean



# Demographics

| Country                        | World bank ranking  | Area (sq km) | Total population (2018) | GDP (PPP) (\$ billion) | Total health expenditures (% of GDP) |
|--------------------------------|---------------------|--------------|-------------------------|------------------------|--------------------------------------|
| Antigua and Barbuda            | High income         | 443          | 95,882                  | 2.398                  | 4.3                                  |
| Bahamas                        | High income         | 13,880       | 332,634                 | 12.06                  | 6.4                                  |
| Barbados                       | High income         | 430          | 293,131                 | 5.218                  | 7.0                                  |
| Bermuda                        | High income         | 54           | 71,176                  | 6.127                  | -                                    |
| Canada                         | High income         | 9,984,670    | 35,881,659              | 1774                   | 10.5                                 |
| Cayman Islands                 | High income         | 264          | 59,613                  | 2.507                  | -                                    |
| Jamaica                        | Upper middle income | 10,991       | 2,812,090               | 26.06                  | 5.9                                  |
| St. Kitts and Nevis            | High income         | 261          | 53,094                  | 1.55                   | 5.6                                  |
| St. Lucia                      | Upper middle income | 616          | 165,510                 | 2.542                  | 6.0                                  |
| St. Vincent and the Grenadines | Upper middle income | 389          | 101,844                 | 1.265                  | 4.2                                  |
| Trinidad and Tobago            | High income         | 5,128        | 1,215,527               | 42.85                  | 6.0                                  |
| Turks and Caicos Islands       | High income         | 948          | 53,701                  | 0.632                  | -                                    |
| United States                  | High income         | 9,833,517    | 329,256,465             | 19490                  | 16.8                                 |
| Virgin Islands (U.S.)          | High income         | 1,910        | 106,977                 | 3.872                  | -                                    |



‘—’: data not reported/unavailable

# CKD and its risk factors burden

| Country                        | CKD Prevalence<br>% (95% CI) | Death attributed to<br>CKD<br>% (95% CI) | DALYS attributed to<br>CKD<br>% (95% CI) | Obesity<br>% (95% CI) | Increased BP<br>% (95% CI) | Smoking<br>% (95% CI) |
|--------------------------------|------------------------------|--|--|-----------------------|----------------------------|-----------------------|
| Antigua and Barbuda            | 10.79 (10.01 - 11.63)        | 4.61 (4.36 - 4.89)                       | 3.15 (2.83 - 3.47)                       | 19.1 (13.9 - 24.8)    | 23.4 (16.6 - 31.1)         | 3.3 (2.5 - 4.5)       |
| Bahamas, The                   | 9.93 (9.23 - 10.71)          | 3.68 (3.47 - 3.88)                       | 2.62 (2.4 - 2.84)                        | 32.1 (26.1 - 38.5)    | 20.9 (15.1 - 27.9)         | 6.1 (4.7 - 8.0)       |
| Barbados                       | 13.63 (12.65 - 14.72)        | 3.22 (3.03 - 3.42)                       | 2.6 (2.39 - 2.81)                        | 24.8 (19.8 - 30.2)    | 24.4 (18.0 - 31.5)         | 4.2 (3.2 - 5.5)       |
| Bermuda                        | 13.86 (12.87 - 15.07)        | 3.09 (2.9 - 3.3)                         | 2.31 (2.09 - 2.52)                       | -                     | -                          | 9.0 (7.1 - 11.2)      |
| Canada                         | 10.25 (9.48 - 11.15)         | 2.18 (2.06 - 2.31)                       | 1.29 (1.18 - 1.4)                        | 31.3 (27.4 - 35.3)    | 13.2 (9.4 - 17.7)          | 13.8 (12.0 - 15.9)    |
| Cayman Islands                 | -                            | -  | -  | -                     | -                          | -                     |
| Jamaica                        | 10.67 (9.91 - 11.49)         | 4 (3.63 - 4.32)                          | 2.89 (2.56 - 3.22)                       | 24.4 (19.9 - 29.2)    | 21.8 (16.0 - 28.4)         | 9.4 (7.3 - 11.7)      |
| St. Kitts and Nevis            | -                            | -  | -  | 23.1 (17.7 - 29.1)    | 25.3 (18.7 - 32.4)         | -                     |
| St. Lucia                      | 11.17 (10.38 - 12.01)        | 4.16 (3.87 - 4.43)                       | 3.04 (2.76 - 3.32)                       | 19.8 (14.9 - 25.1)    | 27.1 (20.2 - 35.0)         | 8.0 (6.4 - 10.1)      |
| St. Vincent and the Grenadines | 11.65 (10.86 - 12.55)        | 3.64 (3.42 - 3.86)                       | 2.83 (2.58 - 3.06)                       | 23.8 (18.4 - 29.8)    | 23.3 (17.0 - 30.5)         | 6.4 (5.0 - 8.0)       |
| Trinidad and Tobago            | 11.46 (10.62 - 12.45)        | 4.14 (3.91 - 4.41)                       | 2.93 (2.64 - 3.24)                       | 19.7 (14.5 - 25.7)    | 25.8 (18.7 - 33.9)         | 14.6 (12.1 - 17.2)    |
| Turks and Caicos Islands       | -                            | -  | -  | -                     | -                          | -                     |
| United States                  | 12.75 (11.87 - 13.78)        | 2.97 (2.93 - 3.02)                       | 1.9 (1.76 - 2.04)                        | 37.3 (33.4 - 41.3)    | 12.9 (9.8 - 16.8)          | 13.3 (13.0 - 13.6)    |
| Virgin Islands (U.S.)          | 14.44 (13.33 - 15.70)        | 3.81 (3.51 - 4.08)                       | 3.02 (2.75 - 3.28)                       | -                     | -                          | 4.1 (3.1 - 5.5)       |

## 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>),  
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 source: Annual Statistics on Organ Replacement in Canada: Dialysis, Transplantation and Donation (2017 Data), Jain et al. (JASN) 2012, Soyibo & Barton (West Indian Medical Journal) 2007, 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 |
| Antigua and Barbuda            | -            | -          | -                        | -          | -          | -          | -          | -          |
| Bahamas, The                   | -            | 651.1      | -                        | -          | -          | -          | -          | -          |
| Barbados                       | -            | 682.5      | -                        | 678.8      | -          | 678.8      | -          | 0          |
| Bermuda                        | -            | -          | -                        | -          | -          | -          | -          | -          |
| Canada                         | 197.7        | 1371.5     | 191.4                    | 794.4      | 146        | 633.3      | 45.4       | 161.1      |
| Cayman Islands                 | -            | 819.5      | -                        | 963.8      | -          | 963.8      | -          | 0          |
| Jamaica                        | -            | 137.4      | -                        | 131.5      | -          | 192.7      | -          | 11.5       |
| St. Kitts and Nevis            | -            | -          | -                        | -          | -          | -          | -          | -          |
| St. Lucia                      | -            | -          | -                        | -          | -          | -          | -          | -          |
| St. Vincent and the Grenadines | -            | -          | -                        | -          | -          | -          | -          | -          |
| Trinidad and Tobago            | -            | 334.6      | -                        | 334.61     | -          | 278.6      | -          | 56.02      |
| Turks and Caicos Islands       | -            | -          | -                        | 1882.4     | -          | 1882.4     | -          | 0          |
| United States                  | 378          | 2196       | 374.1                    | 1582       | 336.7      | 1416.07    | 37.4       | 157.9      |
| Virgin Islands (U.S.)          | -            | -          | -                        | 1441.5     | -          | 1399.1     | -          | 42.4       |

# 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 source: Annual Statistics on Organ Replacement in Canada:  
 Dialysis, Transplantation and Donation (2017 Data), Jain et al. (JASN)  
 2012, Soyibo & Barton (West Indian Medical Journal) 2007, 2017/2018  
 USRDS Annual Data Report

'-': data not reported/unavailable

| Country                        | Kidney transplantation |                    |                             |                           |                          |
|--------------------------------|------------------------|--------------------|-----------------------------|---------------------------|--------------------------|
|                                | Incidence overall      | Prevalence overall | Incidence of deceased donor | Incidence of living donor | Incidence of pre-emptive |
| Antigua and Barbuda            | -                      | -                  | -                           | -                         | -                        |
| Bahamas, The                   | -                      | 3.1                | -                           | -                         | -                        |
| Barbados                       | -                      | 3.7                | -                           | -                         | -                        |
| Bermuda                        | -                      | -                  | -                           | -                         | -                        |
| Canada                         | 48.39                  | 577                | 35.49                       | 12.9                      | 6.3                      |
| Cayman Islands                 | -                      | -                  | -                           | -                         | -                        |
| Jamaica                        | -                      | 6.8                | -                           | -                         | -                        |
| St. Kitts and Nevis            | -                      | -                  | -                           | -                         | -                        |
| St. Lucia                      | -                      | -                  | -                           | -                         | -                        |
| St. Vincent and the Grenadines | -                      | -                  | -                           | -                         | -                        |
| Trinidad and Tobago            | -                      | -                  | -                           | -                         | -                        |
| Turks and Caicos Islands       | -                      | -                  | -                           | -                         | -                        |
| United States                  | 63.6                   | 666                | 45.69                       | 17.91                     | -                        |
| Virgin Islands (U.S.)          | -                      | -                  | -                           | -                         | -                        |

# Annual cost of kidney replacement therapy components

| Country                           | Hemodialysis | Peritoneal dialysis | Kidney Transplant<br>(First year) | Kidney Transplant<br>(later years) | HD/PD cost ratio |
|-----------------------------------|--------------|---------------------|-----------------------------------|------------------------------------|------------------|
| Antigua and Barbuda               | -            | -                   | -                                 | -                                  | -                |
| Bahamas, The                      | -            | -                   | -                                 | -                                  | -                |
| Barbados                          | -            | -                   | -                                 | -                                  | -                |
| Bermuda                           | -            | -                   | -                                 | -                                  | -                |
| Canada                            | 73,789       | 44,434              | 82,852                            | 22,168                             | 1.66             |
| Cayman Islands                    | -            | -                   | -                                 | -                                  | -                |
| Jamaica                           | -            | -                   | -                                 | -                                  | -                |
| St. Kitts and Nevis               | -            | -                   | -                                 | -                                  | -                |
| St. Lucia                         | -            | -                   | -                                 | -                                  | -                |
| St. Vincent and the<br>Grenadines | -            | -                   | -                                 | -                                  | -                |
| Trinidad and Tobago               | -            | -                   | -                                 | -                                  | -                |
| Turks and Caicos Islands          | -            | -                   | -                                 | -                                  | -                |
| United States                     | 88,395       | 68,139              | 35,325                            | -                                  | 1.30             |
| Virgin Islands (U.S.)             | -            | -                   | -                                 | -                                  | -                |

\*Cost is in \$US 2016

**Abbreviations:**

HD (hemodialysis),  
PD (peritoneal dialysis)

Data source: Barnieh et al. (2014), Berger et al. (2009), Bruns et al. (1998), Coyte et al. (1996), Damien et al. (2016), De Vecchi et al. (1994), Goeree et al. (1995), Klarenbach et al. (2014), Komenda et al. (2012), Laupacis et al. (1996), Lee et al. (2002), McMurray and Miller (1997), Neil et al. (2009), Rivara & Mehrotra (2014), Shih et al. (2005), van der Tol et al. (2019)

‘ - ’ : data not reported/unavailable



# Survey response

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- 10 of 14 countries in North America and the Caribbean (71%) responded to the 2018 survey
- This represents 99% of the region's population

# Country level scorecard

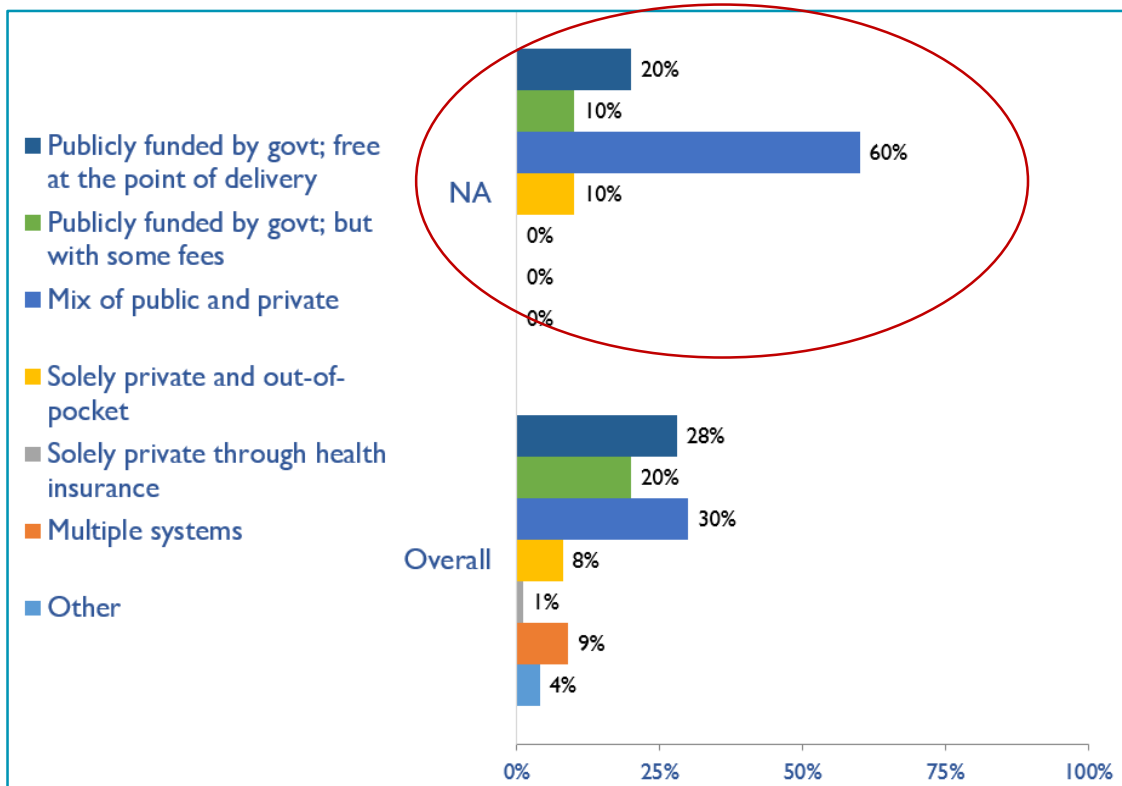
| Countries                     |      | Availability of KRT and CKM |                             |                        |     | Funding for Medications |                        | Availability and Distribution of Registry |          |                 |     | Advocacy Group |     |           | Nephrology 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 |
| <b>North America</b>          |      |                             |                             |                        |     |                         |                        |   |          |                 |     |                |     |           |                            |                       |
| Antigua & Barbuda             | 2017 |                             |                             |                        |     |                         |                        |   |          |                 |     |                |     |           |                            |                       |
|                               | 2019 |                             |                             |                        |     |                         |                        |   |          |                 |     |                |     |           | 31.29                      | 0.00                  |
| Bahamas, The                  | 2017 |                             |                             |                        |     |                         |                        |   |          |                 |     |                |     |           |                            |                       |
|                               | 2019 |                             |                             |                        |     |                         |                        |   |          |                 |     |                |     |           |                            |                       |
| Canada                        | 2017 |                             |                             |                        |     |                         |                        |   |          |                 |     |                |     |           | 17.81                      | 2.14                  |
|                               | 2019 |                             |                             |                        |     |                         |                        |   |          |                 |     |                |     |           | 15.33                      | 1.74                  |
| Cayman Islands                | 2017 |                             |                             |                        |     |                         |                        |   |          |                 |     |                |     |           |                            |                       |
|                               | 2019 |                             |                             |                        |     |                         |                        |   |          |                 |     |                |     |           | 16.77                      | 0.00                  |
| Jamaica                       | 2017 |                             |                             |                        |     |                         |                        |   |          |                 |     |                |     |           |                            |                       |
|                               | 2019 |                             |                             |                        |     |                         |                        |   |          |                 |     |                |     |           | 4.27                       |                       |
| St Kitts and Nevis            | 2017 |                             |                             |                        |     |                         |                        |   |          |                 |     |                |     |           |                            |                       |
|                               | 2019 |                             |                             |                        |     |                         |                        |   |          |                 |     |                |     |           | 18.83                      | 18.83                 |
| St Lucia                      | 2017 |                             |                             |                        |     |                         |                        |   |          |                 |     |                |     |           |                            |                       |
|                               | 2019 |                             |                             |                        |     |                         |                        |   |          |                 |     |                |     |           | 18.13                      | 0.00                  |
| St Vincent and the Grenadines | 2017 |                             |                             |                        |     |                         |                        |   |          |                 |     |                |     |           |                            |                       |
|                               | 2019 |                             |                             |                        |     |                         |                        |   |          |                 |     |                |     |           | 29.46                      | 0.00                  |
| Trinidad and Tobago           | 2017 |                             |                             |                        |     |                         |                        |   |          |                 |     |                |     |           |                            |                       |
|                               | 2019 |                             |                             |                        |     |                         |                        |   |          |                 |     |                |     |           | 5.76                       | 0.00                  |
| United States                 | 2017 |                             |                             |                        |     |                         |                        |   |          |                 |     |                |     |           | 24.89                      | 1.24                  |
|                               | 2019 |                             |                             |                        |     |                         |                        |   |          |                 |     |                |     |           | 29.54                      | 1.74                  |
| 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

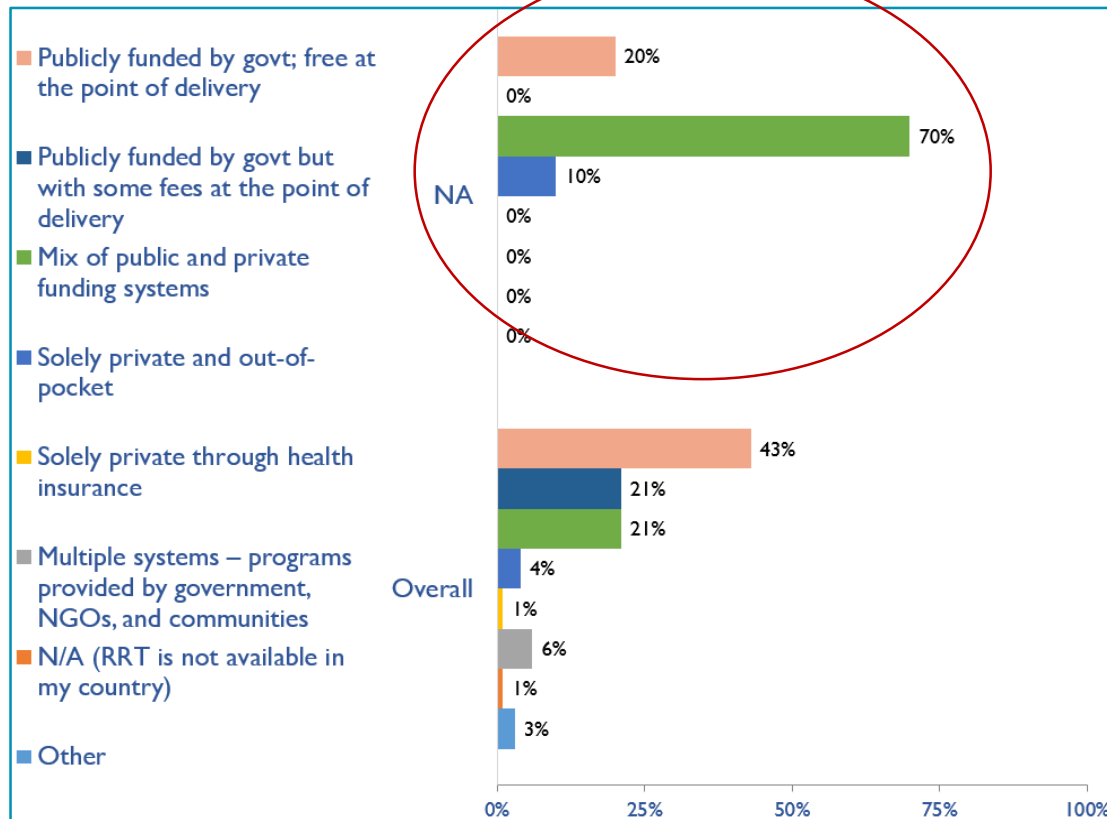
# Funding for non-dialysis CKD



| 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 |
|--------------------------------|--|---|---|----------------------------------|---|------------------|-------|
| Antigua and Barbuda            |  |   | X   |                                  |   |                  |       |
| Bahamas, The                   |  |   | X   |                                  |   |                  |       |
| Canada                         | X  |   |   |                                  |   |                  |       |
| Cayman Islands                 |  |   | X   |                                  |   |                  |       |
| Jamaica                        | X  |   |   |                                  |   |                  |       |
| St. Kitts and Nevis            |  |   |   | X                                |   |                  |       |
| St. Lucia                      |  |   | X   |                                  |   |                  |       |
| St. Vincent and the Grenadines |  | X   |   |                                  |   |                  |       |
| Trinidad and Tobago            |  |   | X   |                                  |   |                  |       |
| United States                  |  |   | X   |                                  |   |                  |       |

X : Yes

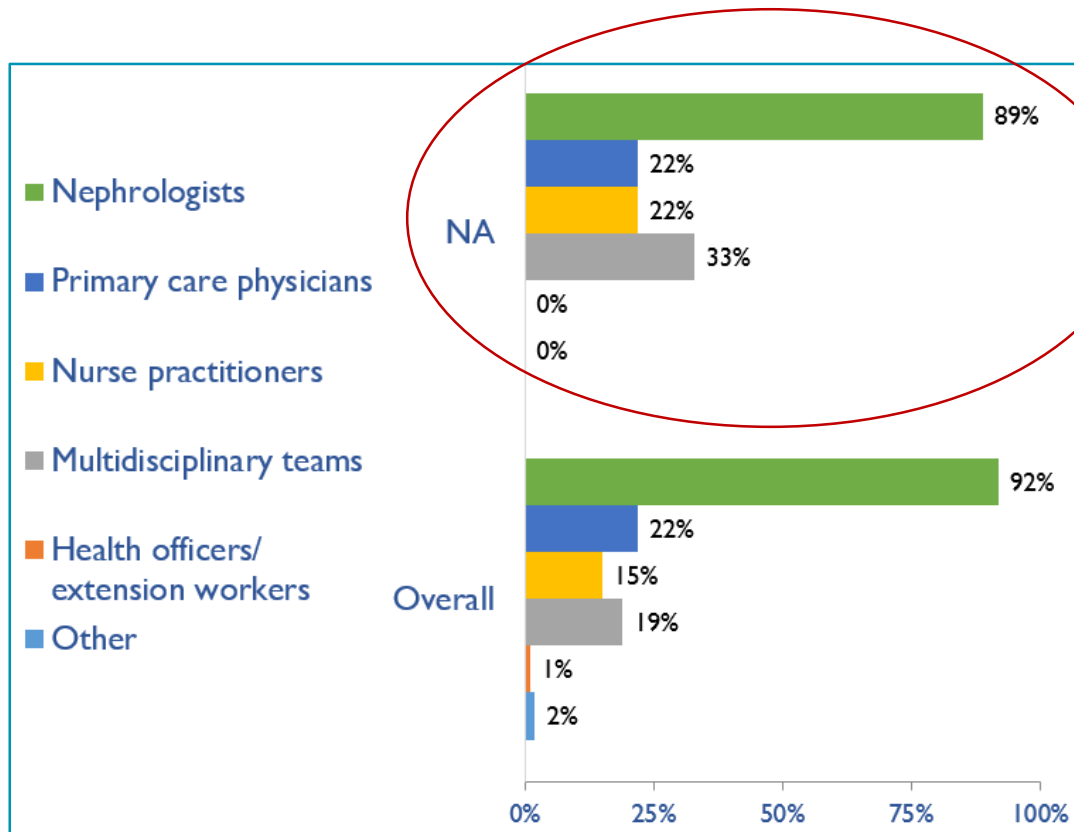
# Funding for kidney replacement therapy (KRT)



| 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 |
|--------------------------------|--|---|---|----------------------------------|---|------------------|--|-------|
| Antigua and Barbuda            | X  |   |   |                                  |   |                  |  |       |
| Bahamas, The                   |  |   | X   |                                  |   |                  |  |       |
| Canada                         | X  |   |   |                                  |   |                  |  |       |
| Cayman Islands                 |  |   | X   |                                  |   |                  |  |       |
| Jamaica                        |  |   | X   |                                  |   |                  |  |       |
| St. Kitts and Nevis            |  |   |   | X                                |   |                  |  |       |
| St. Lucia                      |  |   | X   |                                  |   |                  |  |       |
| St. Vincent and the Grenadines |  |   | X   |                                  |   |                  |  |       |
| Trinidad and Tobago            |  |   | X   |                                  |   |                  |  |       |
| United States                  |  |   | 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 |
|--------------------------------|---------------|-------------------------|---|-------------------------|-----------------------------------|-------|
| Antigua and Barbuda            | X             |                         |   |                         |                                   |       |
| Bahamas, The                   |               |                         |   |                         |                                   |       |
| Canada                         | X             |                         |   |                         |                                   |       |
| Cayman Islands                 | X             |                         |   |                         |                                   |       |
| Jamaica                        | X             | X                       | X   | X                       |                                   |       |
| St. Kitts and Nevis            |               | X                       |   |                         |                                   |       |
| St. Lucia                      | X             |                         |   | X                       |                                   |       |
| St. Vincent and the Grenadines | X             |                         |   |                         |                                   |       |
| Trinidad and Tobago            | X             |                         | X   |                         |                                   |       |
| United States                  | X             |                         |   | 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 |
|--------------------------------|---------------|---------------------|----------------------|----------------------|---|---|------------------------|------------|---------------------------|------------------------------|---------------------------|-------------------------|-----------------|----------------------|
| Antigua and Barbuda            |               |                     |                      |                      |   |   |                        |            |                           |                              |                           |                         |                 |                      |
| Bahamas, The                   |               |                     |                      |                      |   |   |                        |            |                           |                              |                           |                         |                 |                      |
| Canada                         |               |                     |                      |                      |   |   |                        |            |                           |                              |                           |                         |                 |                      |
| Cayman Islands                 |               |                     |                      |                      |   |   |                        |            |                           |                              |                           |                         |                 |                      |
| Jamaica                        |               |                     |                      |                      |   |   |                        |            |                           |                              |                           |                         |                 |                      |
| St. Kitts and Nevis            |               |                     |                      |                      |   |   |                        |            |                           |                              |                           |                         |                 |                      |
| St. Lucia                      |               |                     |                      |                      |   |   |                        |            |                           |                              |                           |                         |                 |                      |
| St. Vincent and the Grenadines |               |                     |                      |                      |   |   |                        |            |                           |                              |                           |                         |                 |                      |
| Trinidad and Tobago            |               |                     |                      |                      |   |   |                        |            |                           |                              |                           |                         |                 |                      |
| United States                  |               |                     |                      |                      |   |   |                        |            |                           |                              |                           |                         |                 |                      |

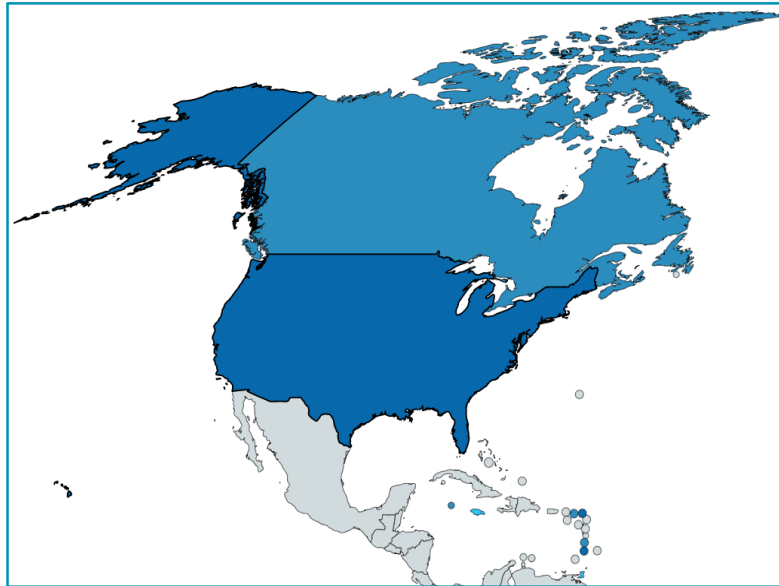
No shortage

Shortage



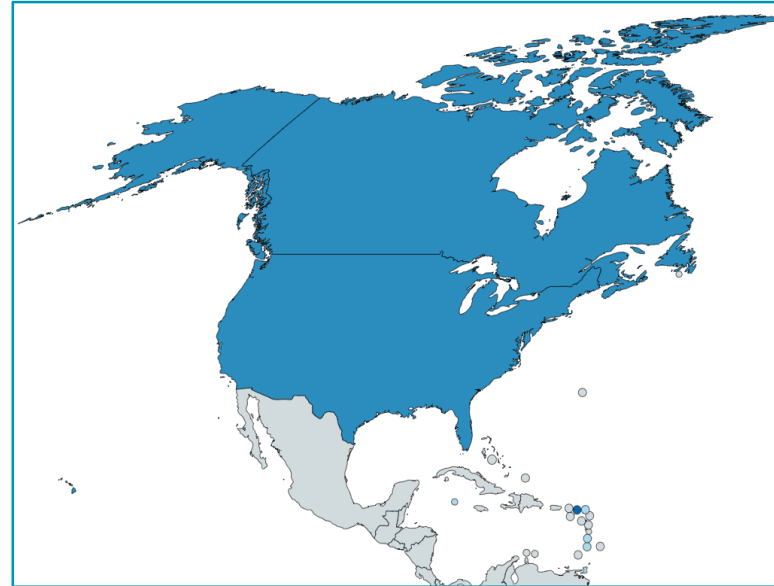
# Prevalence of nephrologists and trainees

Nephrologists



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

Nephrology trainees



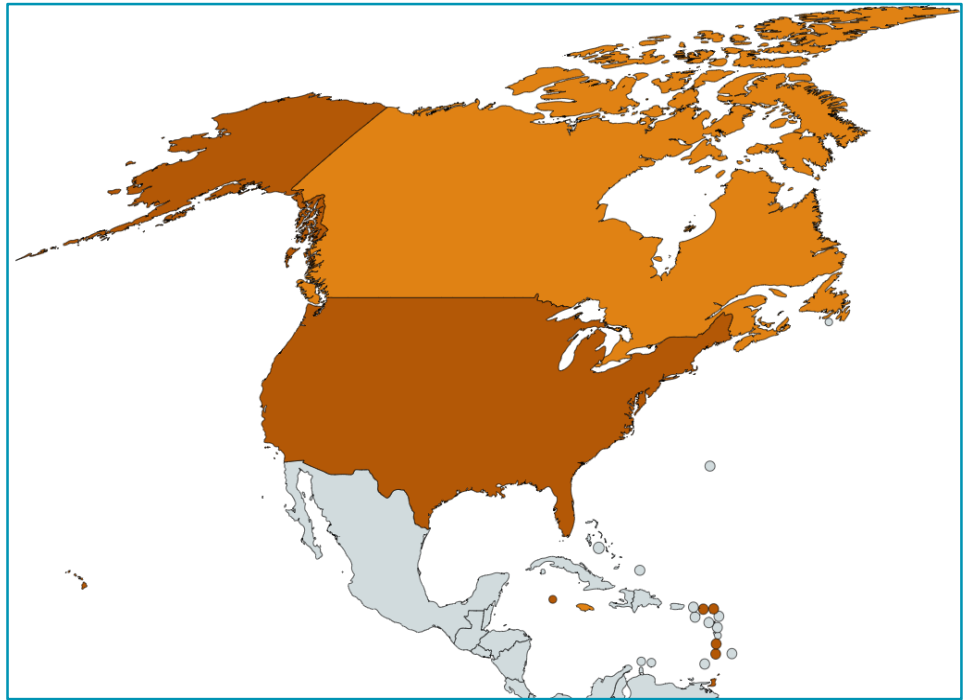
■ <0.3 pmp  
 ■ 0.3–1.4 pmp  
 ■ 1.5–3.7 pmp  
 ■ >3.7 pmp  
 ■ Data not reported

| Country                        | Nephrologists PMP | Nephrology trainees PMP |
|--------------------------------|-------------------|-------------------------|
| Antigua and Barbuda            | 31.29             | 0.00                    |
| Bahamas, The                   | -                 | -                       |
| Canada                         | 15.33             | 1.74                    |
| Cayman Islands                 | 16.77             | 0.00                    |
| Jamaica                        | 4.27              | -                       |
| St. Kitts and Nevis            | 18.83             | 18.83                   |
| St. Lucia                      | 18.13             | 0.00                    |
| St. Vincent and the Grenadines | 29.46             | 0.00                    |
| Trinidad and Tobago            | 5.76              | 0.00                    |
| United States                  | 29.54             | 1.74                    |

' - ' : data not reported/unavailable

# 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

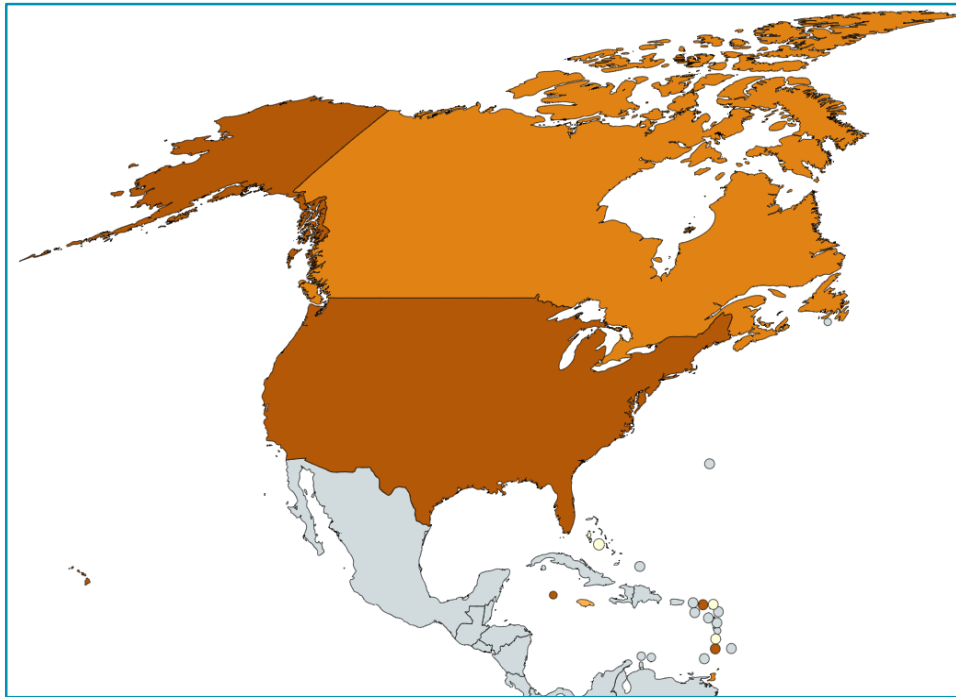
- Chronic HD services are available in all countries of the region
- The North America average of HD treatment centers is 18.13 pmp

| Country                        | Chronic HD Centres PMP |
|--------------------------------|------------------------|
| Antigua and Barbuda            | 10.43                  |
| Bahamas, The                   | -                      |
| Canada                         | 5.57                   |
| Cayman Islands                 | 33.55                  |
| Jamaica                        | 4.62                   |
| St. Kitts and Nevis            | 18.83                  |
| St. Lucia                      | 18.13                  |
| St. Vincent and the Grenadines | 19.64                  |
| Trinidad and Tobago            | 14.81                  |
| United States                  | 20.54                  |

' - ': data not reported/unavailable

# Capacity for chronic dialysis (PD)

Chronic PD centers



- Chronic PD services are available in 7 (78%) countries of the region
- The North America average of PD treatment centers is 7.16 pmp

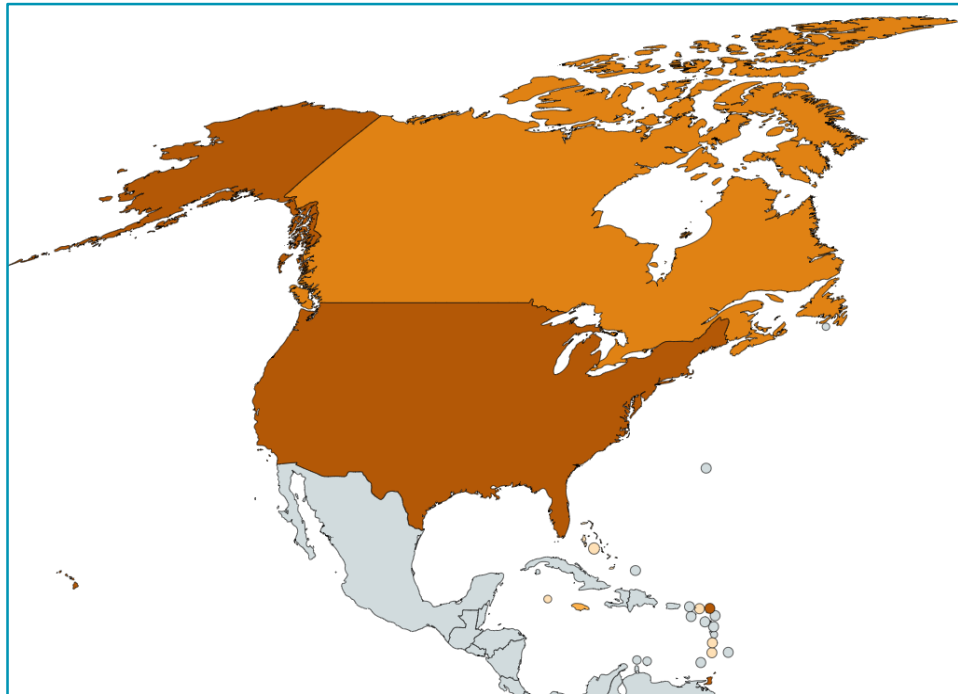
| Country                        | Chronic PD Centres PMP |
|--------------------------------|------------------------|
| Antigua and Barbuda            | -                      |
| Bahamas, The                   | -                      |
| Canada                         | 1.39                   |
| Cayman Islands                 | 16.77                  |
| Jamaica                        | 1.07                   |
| St. Kitts and Nevis            | 18.83                  |
| St. Lucia                      | -                      |
| St. Vincent and the Grenadines | 9.82                   |
| Trinidad and Tobago            | 1.65                   |
| United States                  | 7.16                   |

' - ' : 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 5 (56%) countries of the region
- The North America average of Kidney transplantation centers is 0.75 pmp

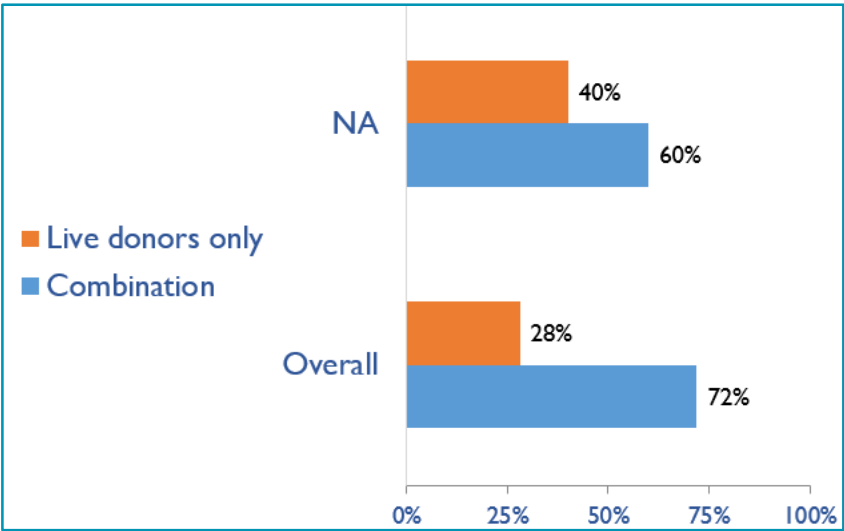
| Country                        | Kidney Transplantation availability | Transplant centers PMP |
|--------------------------------|-------------------------------------|------------------------|
| Antigua and Barbuda            | X                                   | 10.43                  |
| Bahamas, The                   |                                     | -                      |
| Canada                         | X                                   | 0.59                   |
| Cayman Islands                 |                                     | -                      |
| Jamaica                        | X                                   | 0.36                   |
| St. Kitts and Nevis            |                                     | -                      |
| St. Lucia                      |                                     | -                      |
| St. Vincent and the Grenadines |                                     | -                      |
| Trinidad and Tobago            | X                                   | 0.82                   |
| United States                  | X                                   | 0.75                   |

‘ – ’ : data not reported/unavailable

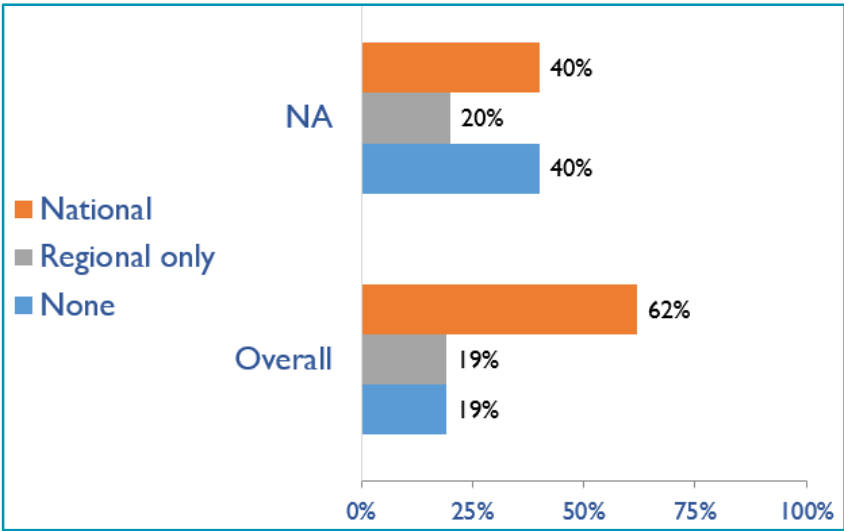
X : Yes

# Capacity for kidney transplantation (cont'd)

Transplant donor type



Transplant waitlist

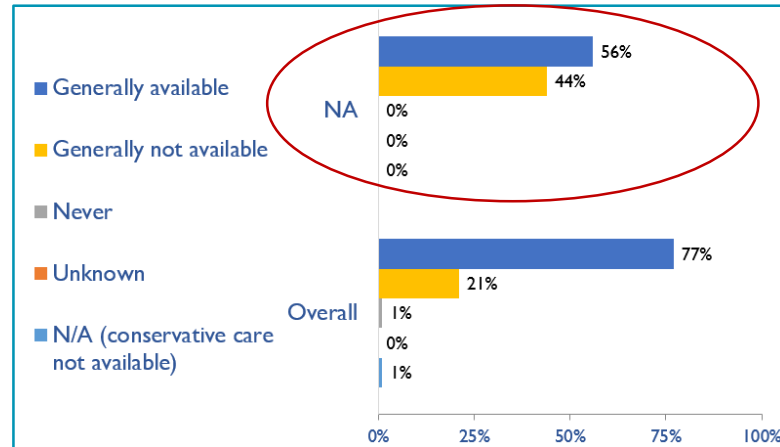


| Country                        | Donor type       |             | Transplant waitlist |               |      |
|--------------------------------|------------------|-------------|---------------------|---------------|------|
|                                | Live donors only | Combination | National            | Regional only | None |
| Antigua and Barbuda            | X                |             |                     |               | X    |
| Bahamas, The                   |                  |             |                     |               |      |
| Canada                         |                  | X           |                     | X             |      |
| Cayman Islands                 |                  |             |                     |               |      |
| Jamaica                        | X                |             |                     |               | X    |
| St. Kitts and Nevis            |                  |             |                     |               |      |
| St. Lucia                      |                  |             |                     |               |      |
| St. Vincent and the Grenadines |                  |             |                     |               |      |
| Trinidad and Tobago            |                  | X           | X                   |               |      |
| United States                  |                  | X           | X                   |               |      |

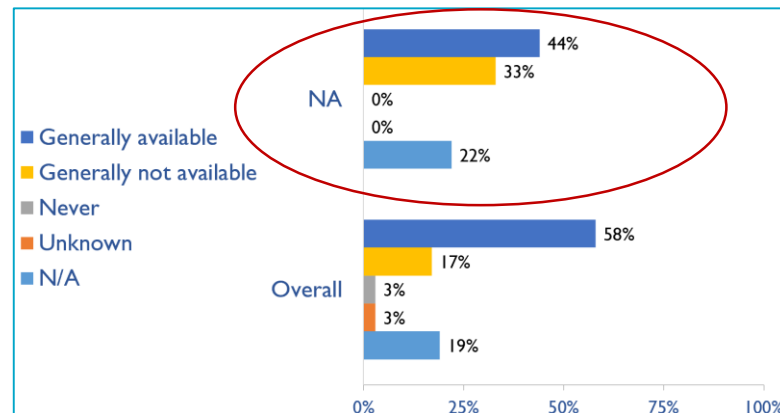
X : Yes

# Availability of services within dialysis care

## HD frequency



## PD frequency

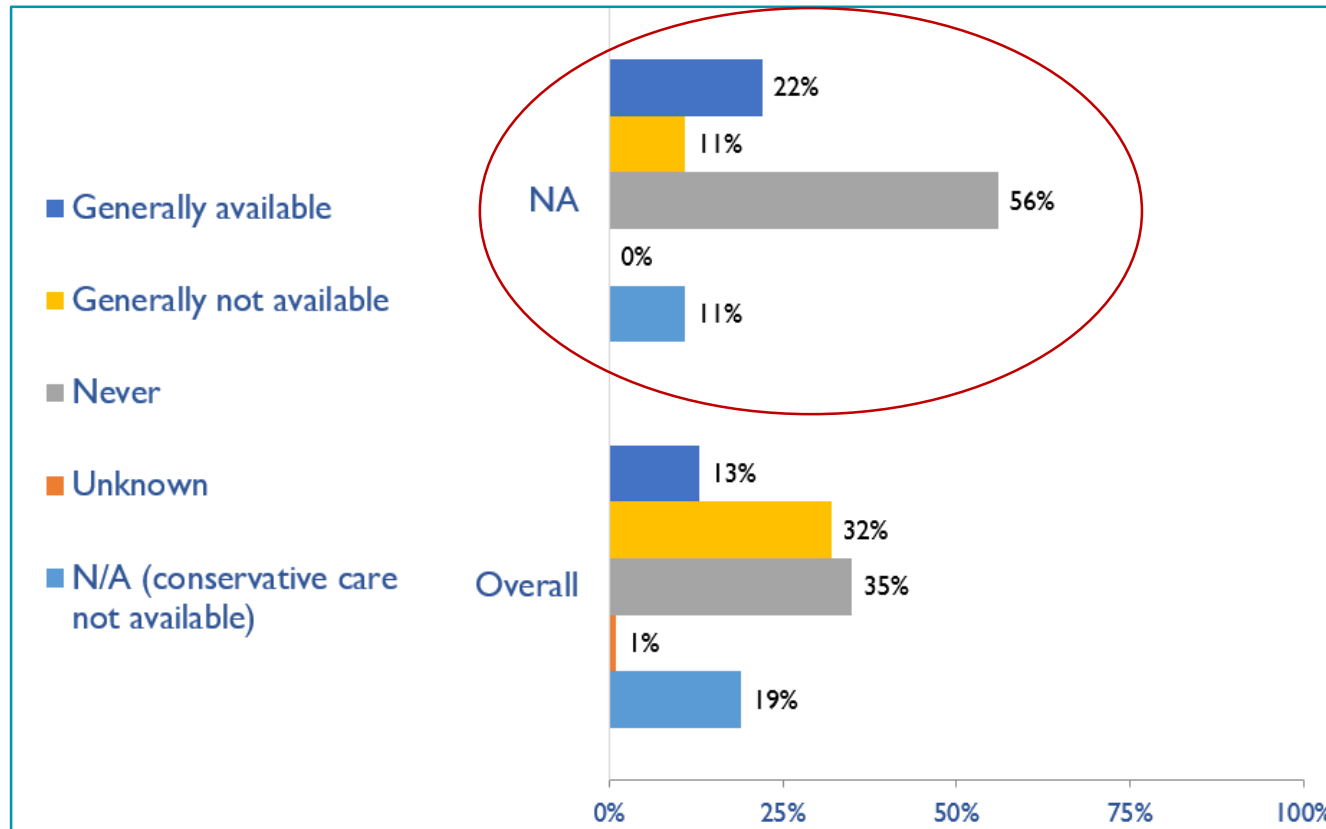


| Country                        | HD frequency<br>a center-based service that involves treatment<br>3x week/3-4x hours |                         |       |         |                             | PD frequency<br>ability to do adequate exchanges<br>3-4x day<br>(or equivalent cycles on automated PD) |                         |       |         |                             |
|--------------------------------|--|-------------------------|-------|---------|-----------------------------|--|-------------------------|-------|---------|-----------------------------|
|                                | Generally available  | Generally not available | Never | Unknown | N/A (dialysis not provided) | Generally available  | Generally not available | Never | Unknown | N/A (dialysis not provided) |
| Antigua and Barbuda            |  | X                       |       |         |                             |  |                         | X     |         |                             |
| Bahamas, The                   |  |                         |       |         |                             |  |                         |       |         |                             |
| Canada                         | X  |                         |       |         |                             | X  |                         |       |         |                             |
| Cayman Islands                 | X  |                         |       |         |                             | X  |                         |       |         |                             |
| Jamaica                        |  | X                       |       |         |                             |  | X                       |       |         |                             |
| St. Kitts and Nevis            |  | X                       |       |         |                             |  | X                       |       |         |                             |
| St. Lucia                      | X  |                         |       |         |                             |  |                         |       |         | X                           |
| St. Vincent and the Grenadines |  | X                       |       |         |                             | X  |                         |       |         |                             |
| Trinidad and Tobago            | X  |                         |       |         |                             |  | X                       |       |         |                             |
| United States                  | X  |                         |       |         |                             | X  |                         |       |         |                             |

X :  
Yes



# Availability of home hemodialysis

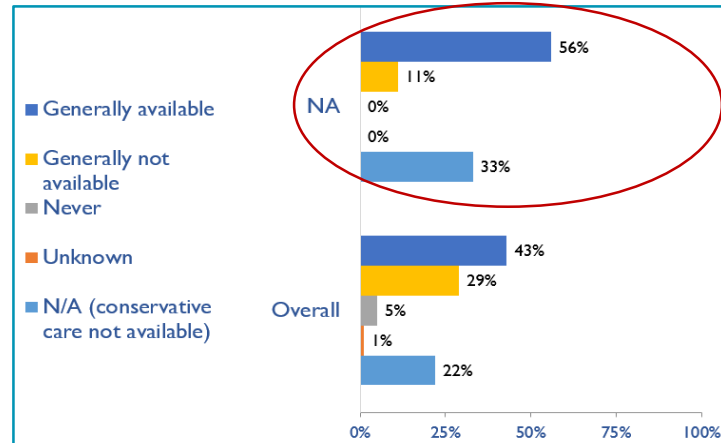


| Country                        | Availability of Home hemodialysis |                         |       |         |                             |
|--------------------------------|-----------------------------------|-------------------------|-------|---------|-----------------------------|
|                                | Generally available               | Generally not available | Never | Unknown | N/A (dialysis not provided) |
| Antigua and Barbuda            |                                   |                         | X     |         |                             |
| Bahamas, The                   |                                   |                         |       |         |                             |
| Canada                         | X                                 |                         |       |         |                             |
| Cayman Islands                 |                                   | X                       |       |         |                             |
| Jamaica                        |                                   |                         | X     |         |                             |
| St. Kitts and Nevis            |                                   |                         | X     |         |                             |
| St. Lucia                      |                                   |                         | X     |         |                             |
| St. Vincent and the Grenadines |                                   |                         | X     |         |                             |
| Trinidad and Tobago            |                                   |                         | X     |         |                             |
| United States                  | X                                 |                         |       |         |                             |

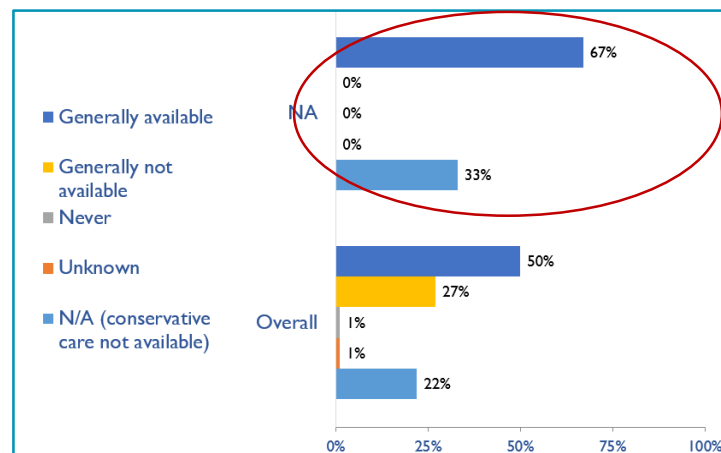
X :  
Yes

# Capacity for conservative kidney management (CKM)

## Choice-restricted CKM



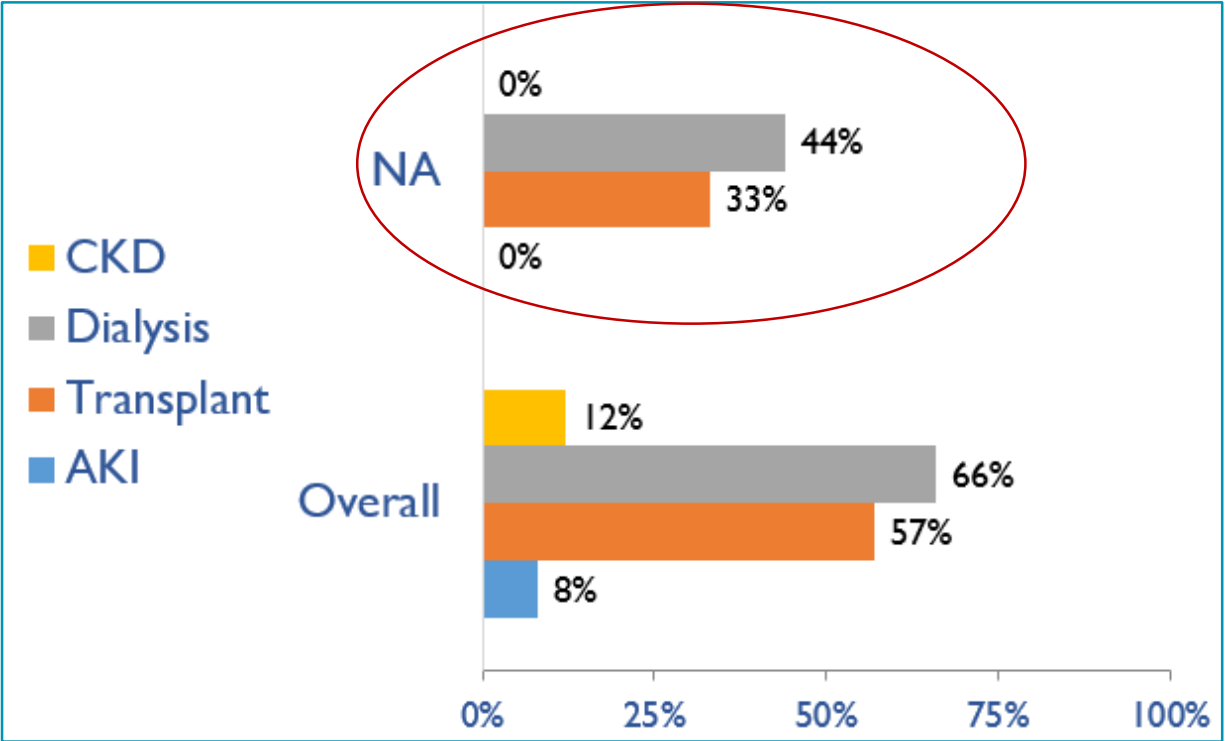
## Chosen or medically advised CKM



| 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) |
| Antigua and Barbuda            |   |                         |       |         | X                                     |   |                         |       |         | X                                     |
| Bahamas, The                   |   |                         |       |         |                                       |   |                         |       |         |                                       |
| Canada                         | X   |                         |       |         |                                       | X   |                         |       |         |                                       |
| Cayman Islands                 |   | X                       |       |         |                                       | X   |                         |       |         |                                       |
| Jamaica                        | X   |                         |       |         |                                       | X   |                         |       |         |                                       |
| St. Kitts and Nevis            |   |                         |       |         | X                                     |   |                         |       |         | X                                     |
| St. Lucia                      | X   |                         |       |         |                                       | X   |                         |       |         |                                       |
| St. Vincent and the Grenadines | X   |                         |       |         |                                       | X   |                         |       |         |                                       |
| Trinidad and Tobago            |   |                         |       |         | X                                     |   |                         |       |         | X                                     |
| United States                  | X   |                         |       |         |                                       | X   |                         |       |         |                                       |

X :  
Yes

# Availability of official registry



| Country                        | CKD | Dialysis | Transplant | AKI |
|--------------------------------|-----|----------|------------|-----|
| Antigua and Barbuda            |     |          |            |     |
| Bahamas, The                   |     |          |            |     |
| Canada                         |     | X        | X          |     |
| Cayman Islands                 |     |          |            |     |
| Jamaica                        |     | X        |            |     |
| St. Kitts and Nevis            |     |          |            |     |
| St. Lucia                      |     | X        |            |     |
| St. Vincent and the Grenadines |     |          |            |     |
| Trinidad and Tobago            |     |          | X          |     |
| United States                  |     | X        | X          |     |

X :  
Yes

# Summary of 2019 GKHA findings

- Availability, access, and quality of dialysis is high, transplantation services are limited
- Conservative kidney management is available, generally as chosen or medically advised
- Government funding for kidney care is low
- Few registries across all levels of kidney disease, particularly CKD and AKI
- High workforce capacity: high nephrologist density, few provider shortages reported. Half of countries with no nephrology trainees
- Strong advocacy for CKD and ESKD in North America and the Caribbean, none for AKI

# 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)