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# South African Renal Registry Annual Report 2020

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## ABSTRACT

The ninth annual report of the South African Renal Registry summarises the December 2020 data on kidney replacement therapy (KRT) for patients with kidney failure in South Africa. The numbers of patients reported here are substantially lower than those recorded in the previous report. This is likely the result of several factors, including larger numbers of deaths from COVID-19 and other causes, delayed initiation of KRT due to the pandemic, and challenges with data submission to the registry during a period when personnel were overwhelmed with clinical responsibilities related to the pandemic.

In December 2020, the number of patients who were being treated with chronic dialysis or transplantation stood at 8 734, a prevalence of 146 per million population (pmp). The prevalence of South Africans accessing treatment in the private healthcare sector was 729 pmp, whereas it was 44 pmp in the chronically under-resourced public sector, well below the rate reported for 1994.

**Keywords:** renal registry; South Africa; haemodialysis; peritoneal dialysis; transplantation; COVID-19.

## INTRODUCTION

The South African Renal Registry (SARR) collects, analyses and publishes information on the treatment of patients with kidney failure in South Africa on behalf of the South African Nephrology Society. This is the ninth consecutive annual report published by the SARR, which summarises the data on record for December 2020 on kidney replacement therapy (KRT) for patients with kidney failure in South Africa.

The COVID-19 pandemic resulted in many deaths of our patients on KRT. Studies from South Africa [1] and elsewhere [2] reported mortality rates from COVID-19 approximating 20% in patients on maintenance dialysis, and exceeding 20% in kidney transplant recipients. Transplantation programmes were suspended because of concerns regarding the consequences of SARS-CoV-2 infection in immunocompromised patients, and the management of potential deceased donors was stopped so that emergency departments and intensive care units could prioritise patients with COVID-19 [3]. In the public healthcare sector, where opening new slots for dialysis is largely dependent on an active transplant programme, this led to a further decrease in the access to KRT for patients with kidney failure.

The pandemic also presented major obstacles to the usual operations of the registry. Data capturers had difficulty accessing treatment centres during the lockdown periods, the staff at these facilities were overwhelmed with the challenges of managing cases of COVID-19 and many contracted the disease themselves.

## METHODS

### Registry platform

Our current platform was developed using the Webdev programming environment (www.windev.com) and resides on a secure, dedicated, Windows 10 server at a South African internet hosting company. It runs Windows Internet Information Services (IIS) and uses the client/server version of HFSQL (formerly Hyperfile SQL) as its relational database management system. Data capturers interface with the central database via user-friendly web pages from any device with internet access. The platform uses end-to-end encryption and full backups are made daily.

The quality of our data has improved considerably since we began cross-checking the identity numbers of our

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patients with the Department of Home Affairs database of births and deaths, which is accessible via the South African Medical Research Council. This has allowed us to analyse and report on patient survival [4] and, more recently, on the survival of elderly patients starting KRT [5].

Over the past few years, the technology platform of the SARR has been expanded to serve as the backbone of the African Renal Registry. Botswana, Burundi, Ghana, Kenya, Nigeria and Zambia have joined the African Renal Registry and have commenced data collection with the aid of our platform [6].

### Definitions

**Kidney failure and start date of KRT.** Kidney failure refers to advanced, irreversible kidney disease which requires the initiation of KRT. The start date is the date of first haemodialysis (HD), the date of the first peritoneal dialysis (PD) flushes or exchanges, or the date of pre-emptive transplantation (where there is no prior dialysis). For patients who are initially thought to have acute kidney injury (AKI) and are dialysed but who do not recover function and then continue KRT, the start date is the date of the first dialysis, even though the diagnosis at that time was AKI and not kidney failure.

**Initial KRT modality.** This is the intended first modality and should normally be the modality being used on day 91 of KRT. This means that someone who presents late and who is started on urgent HD but is soon established on PD, will have PD recorded as the initial modality.

**Changes in the responsible treating unit.** This refers to a change in the dialysis unit, PD follow-up unit/clinic or transplant follow-up unit/centre/practice. A transfer entry in the registry is required to record this. This is not done for short-term transfers when the intention is that the patient will return to the "home" unit, for example, for holiday dialysis, temporary transfer to a unit with isolation facilities, etc.

**Primary kidney disease.** Responsible nephrologists/physicians should assist their data-capturers to ensure that this critical information is accurate. We are using the diagnostic codes of the ERA registry [7]. If there is uncertainty about the diagnosis, as is often the case with patients who present late, then it should be recorded as **"chronic kidney disease (CKD) – aetiology uncertain/unknown"**. In patients who present with kidney failure, small kidneys and hypertension, there should not be an automatic default to labelling such patients as having "chronic glomerulonephritis" or "hypertensive kidney disease".

**Chronic hypertensive nephropathy or malignant hypertensive nephropathy.** This should be selected as the primary kidney disease only if there is no reason to suspect that the hypertension is secondary to pre-existing renal disease. We suggest that the following criteria be met: hypertension known to precede kidney dysfunction, left ventricular hypertrophy, proteinuria <2 g/day and no evidence of other kidney diseases [8,9].

**Lost to follow-up.** The SARR assumes that a functioning transplant is maintained unless there is evidence of a "transplant failure" or death. A dialysis modality is assumed to continue for one year from the date of the last registry entry or laboratory result, in the absence of evidence of death; thereafter, the patient is considered lost to follow-up. Patients are also considered lost to follow-up one year after a "transplant failure" entry if no further entries are recorded.

**Recovered kidney function.** Patients who have been initiated on chronic HD/PD and who no longer require dialysis are removed from the registry. The period of dialysis-free recovery must persist for at least 90 days; if the period of recovery is less than 90 days and dialysis is restarted, there should be no END entry and dialysis is considered to have been continuous. If the period of recovery exceeds 90 days and the patient restarts KRT, a new entry is recorded for the patient.

### Ethical approval

The SARR operates as a longitudinal study with ethical approval from the Health Research Ethics Committee of Stellenbosch University (reference no. N11/01/028). This is renewed annually upon submission of a progress report. A waiver of individual informed consent has been granted, and the approval includes countrywide data collection on adults and children, in the public and private sectors, and the tapping of various data sources to improve the accuracy and completeness of data. These include records available through doctors' practices, dialysis and transplant centres, provider companies and medical aid funds. Ethical approval has also been granted for the use of the expanded SARR platform for the African Renal Registry.

## RESULTS

### South Africa in 2020

Figure 1 illustrates the provinces and major cities of South Africa. According to the Statistics South Africa (Stats SA) mid-year estimates for 2020 [10], the population of South Africa had increased to 59.62 million people. There was a slight female predominance (51.1%) and Black/African citizens constituted 80.8% of the population (Table 1). About 28.6% of the population was younger than 15 years of age and approximately 9.1% was 60 years or older. The province of Gauteng was home to 26.0% of the population, followed by KwaZulu-Natal with 19.3% (Table 2). Within South Africa, migration has a major impact on the age structure and distribution of provincial populations. For the period 2016–2021, Gauteng and the Western Cape experienced the largest net inflows of migrants, estimated at 980 398 and 290 555, respectively [10].

South Africa is classified as an upper-middle-income country by the World Bank, with a gross national income per capita for 2020 by the Atlas method (current US$) of $6 010 and by the purchasing power parity (PPP) method (current international US$) of $13 140 [11]. Most of the

population (85.1%) rely on the public healthcare sector for services, with only a small proportion (14.9%) having medical insurance and accessing private sector health care [12].

Life expectancy at birth for 2020 was estimated at 62.5 years for males and 68.5 years for females. The infant mortality rate was estimated at 23.6 per 1 000 live births. The overall HIV prevalence was 13.0%, and 18.7% for adults aged 15–49 [10].


**Figure 1.** Provinces and major cities of South Africa.

**Table 1.** Population data by ethnic group.

| Population group | Million | % |
|---|---|---|
| Black | 48.15 | 80.8 |
| Coloured (mixed ancestry) | 5.25 | 8.8 |
| White | 4.68 | 7.8 |
| Indian/Asian | 1.54 | 2.6 |
| **Total** | **59.62** | **100** |

**Table 2.** Population data by province.

| Province | Million | % |
|---|---|---|
| Eastern Cape (EC) | 6.73 | 11.3 |
| Free State (FS) | 2.93 | 4.9 |
| Gauteng (GT) | 15.49 | 26.0 |
| KwaZulu-Natal (KZN) | 11.53 | 19.3 |
| Limpopo (LP) | 5.85 | 9.8 |
| Mpumalanga (MP) | 4.68 | 7.8 |
| North West (NW) | 4.11 | 6.9 |
| Northern Cape (NC) | 1.29 | 2.2 |
| Western Cape (WC) | 7.01 | 11.8 |
| **Total** | **59.62** | **100** |

## Treatment centres for dialysis and transplantation

The number of centres contributing data was 296; of these, 262 (88.5%) are privately owned (Table 3 and Appendix 1). Several provinces have increased access for their public sector patients by utilising spare capacity at private haemodialysis centres on a fee-per-treatment basis. There are also a few privately run centres on the premises of government hospitals which serve public sector patients.

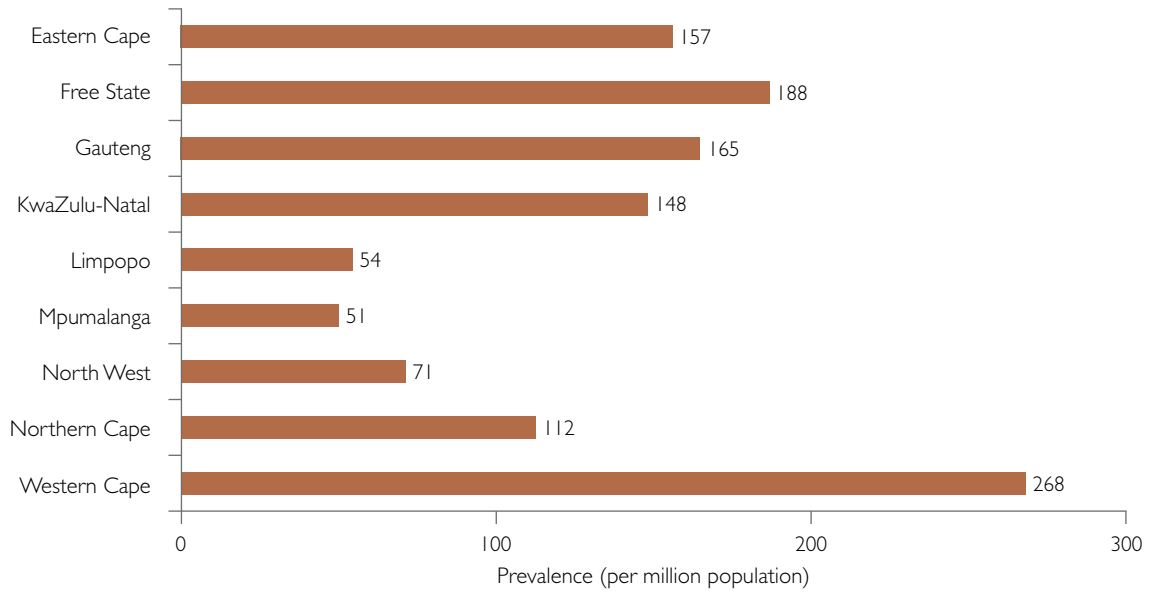
**Table 3.** Number of treatment centres by province and sector.

| Sector | EC | FS | GT | KZN | LP | MP | NW | NC | WC | All |
|---|---|---|---|---|---|---|---|---|---|---|
| Public | 4 | 7 | 7 | 6 | 1 | 0 | 3 | 1 | 5 | 34 |
| Private | 23 | 14 | 79 | 62 | 15 | 15 | 13 | 5 | 36 | 262 |
| **Total** | **27** | **21** | **86** | **68** | **16** | **15** | **16** | **6** | **41** | **296** |

## Prevalence and incidence of renal replacement therapy

The total number of patients on KRT on 31 December 2020 was 8 734. This is a prevalence of 146 per million population (pmp). The province with the highest patient numbers remained Gauteng, followed by the Western Cape and KwaZulu-Natal, whereas the province with the highest prevalence was the Western Cape, followed by the Free State and Gauteng (Figure 2).

There were 672 patients who started KRT in 2020, an incidence of 11.3 pmp. Most of these patients (73.8%) were treated in private centres.




| Province | EC | FS | GT | KZN | LP | MP | NW | NC | WC | All |
|---|---|---|---|---|---|---|---|---|---|---|
| **Patients** | 1 056 | 552 | 2 552 | 1 701 | 318 | 240 | 293 | 145 | 1 877 | 8 734 |

**Figure 2.** Prevalence and numbers of patients on KRT by province.

The number of patients treated in the public sector declined, with a prevalence of 44 pmp (Table 4). In the private sector, the prevalence was 729 pmp. The numbers of patients and prevalences by province and healthcare sector are shown in Table 5 and Figure 3. Denominators for prevalence calculations are based on the Stats SA mid-term estimates [10] and the Council for Medical Schemes Annual Report [12]. Medical aid beneficiaries who were unclassified with respect to province were allocated to provinces in proportion to the numbers of beneficiaries in each province.

**Table 4.** KRT prevalence by healthcare sector.

| | Public | Private |
|---|---|---|
| Population in millions | 50.72 | 8.90* |
| Patients on treatment | 2 248 | 6 486 |
| Treatment rate (pmp) | 44 | 729 |

*Council for Medical Schemes Annual Report 2020/21

**Table 5.** Numbers of patients by sector and province.

| Sector | EC | FS | GT | KZN | LP | MP | NW | NC | WC | All |
|---|---|---|---|---|---|---|---|---|---|---|
| Public | 286 | 263 | 399 | 247 | 75 | 12 | 53 | 70 | 843 | 2 248 |
| Private | 770 | 289 | 2 153 | 1 454 | 243 | 228 | 240 | 75 | 1 034 | 6 486 |
| **Total** | **1 056** | **552** | **2 552** | **1 701** | **318** | **240** | **293** | **145** | **1 877** | **8 734** |

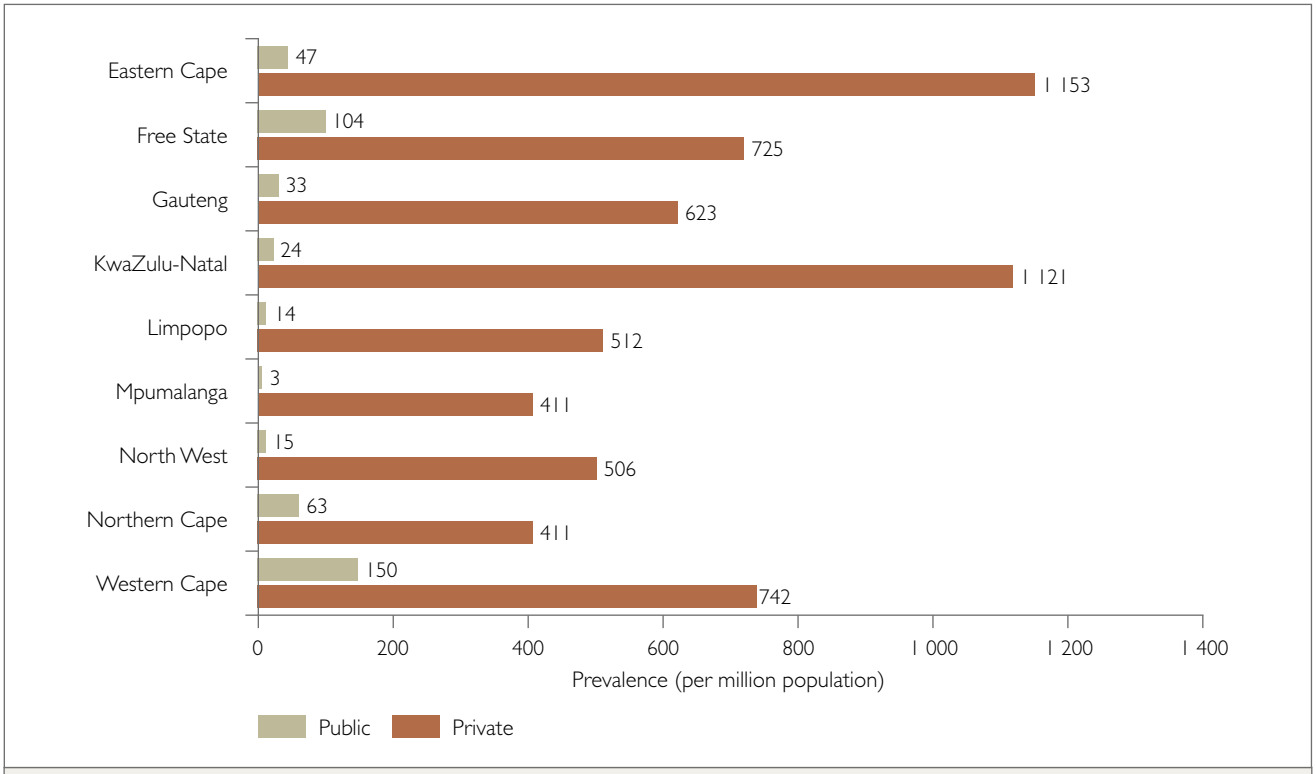
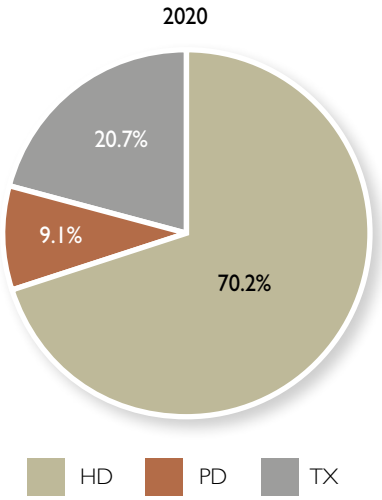



**Figure 3.** Prevalence of KRT by province and sector.

## Treatment modality and KRT vintage

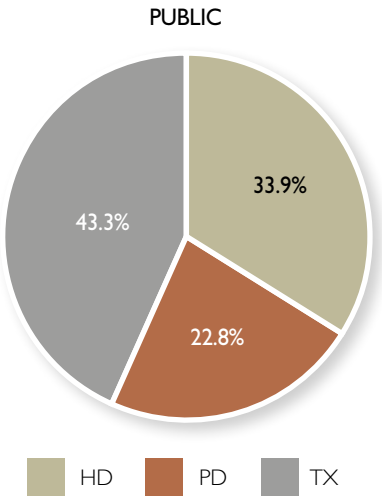
Of the patients on KRT in December 2020, 20.7% had a functioning kidney transplant. Of the patients on dialysis, 88.5% were on haemodialysis and 11.5% were on peritoneal dialysis. Most of the transplant and peritoneal dialysis patients were in the public sector; the private sector had much lower proportions of patients on these KRT modalities (Figures 4 and 5).

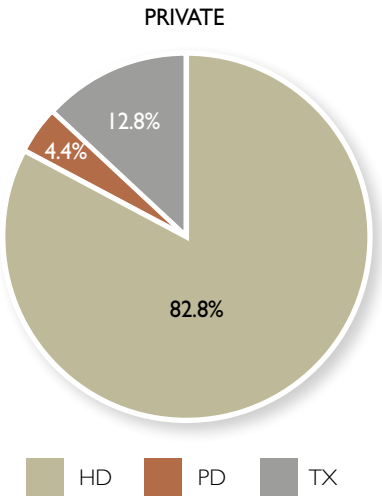
Overall, the median KRT vintage was 5.8 years [interquartile range (IQR) 3.2–9.3 years]. The median vintage was 5.1 years (IQR 2.8–8.0 years) for patients on haemodialysis, 3.6 years (IQR 1.5–6.1 years) for patients on peritoneal dialysis and 10.4 years (IQR 7.3–14.6 years) for transplant recipients.




| Modality | Patients | % |
|---|---|---|
| Haemodialysis | 6 134 | 70.2 |
| Peritoneal dialysis | 795 | 9.1 |
| Transplant | 1 805 | 20.7 |

**Figure 4.** Distribution of patients by treatment modality.




| Treatment modality | Public sector | | Private sector | |
|---|---|---|---|---|
| | Patients | % | Patients | % |
| Haemodialysis | 762 | 33.9 | 5 372 | 82.8 |
| Peritoneal dialysis | 513 | 22.8 | 282 | 4.4 |
| Transplant | 973 | 43.3 | 832 | 12.8 |

**Figure 5.** KRT modality by sector.

## Demographic and clinical data

The median age of the patients on KRT was 53.0 years (IQR 42.4–62.5 years) and 59.8% were male. Because of the rationing and selection criteria applied in public sector hospitals, patients treated there were much younger than those treated in the private sector (44.3 versus 56.0 years). Just more than half of the patients were Black. However, the prevalence was still lowest in Blacks (95 pmp) and highest in Indians/Asians (661 pmp) (Figure 6).

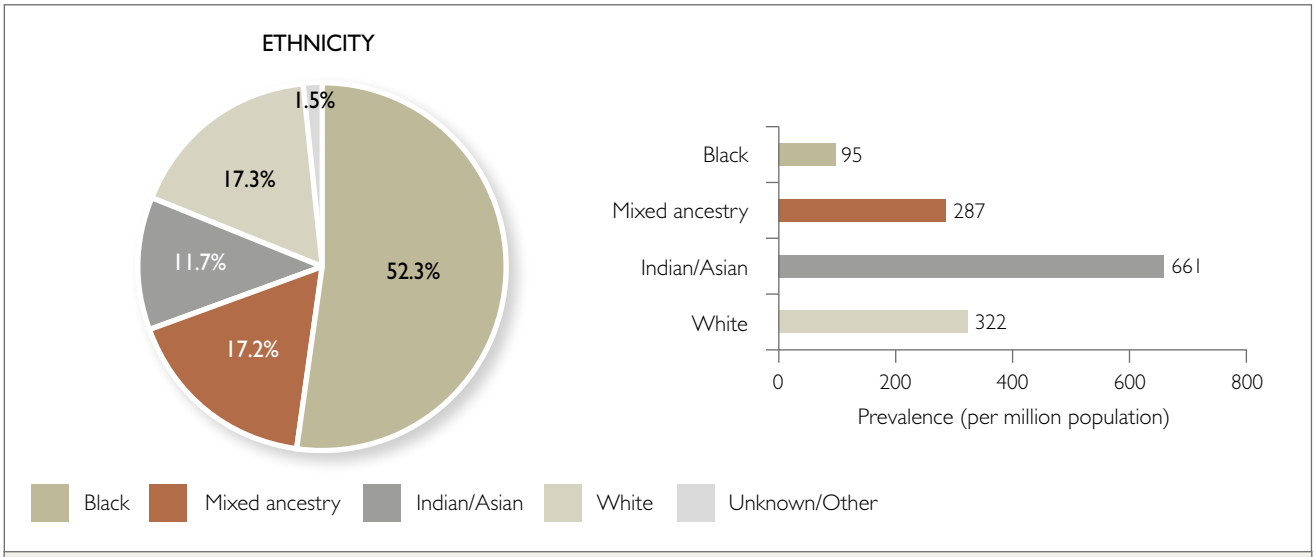



**Figure 6.** KRT patient numbers and prevalence by ethnicity.

The most common primary kidney disease was hypertensive kidney disease, followed by CKD/kidney failure of unknown cause and diabetic nephropathy (Table 6).

**Table 6.** Most commonly causes of kidney failure.

| | % of total |
|---|---|
| Hypertensive kidney disease | 36.6 |
| Cause unknown | 30.4 |
| Diabetic nephropathy | 14.3 |
| Glomerular disease | 11.0 |
| Cystic kidney disease | 3.3 |
| Obstruction and reflux | 1.7 |

Of the patients with data on diabetes status (8 042 patients), 38.0% had diabetes, with a much higher percentage in the private than in the public sector (45.5% versus 16.6%). The seropositive rate for hepatitis B virus was 2.3% (173 of 7 629 patients), for hepatitis C virus 0.5% (32 of 7 059 patients) and for HIV 12.1% (881 of 7 309 patients).

## DISCUSSION

The number of patients on KRT in South Africa stood at 8 734 in December 2020, a prevalence of 146 pmp. These numbers are substantially lower than those reported for December 2019, when the total number of patients treated was 9 937 and the prevalence 169 pmp [13]. We speculate that this is the result of several factors, including larger numbers of deaths (from COVID-19 and other causes), delayed initiation of KRT due to the pandemic, and challenges with data submission to the registry during a period when personnel were overwhelmed with clinical responsibilities related to the pandemic.

The data presented in this report must therefore be interpreted with caution. The many missing year-end entries led to more patients being classified as "lost to follow-up". Some of these patients may still be alive and receiving KRT. In addition, it is likely that some new patients who had started KRT had not yet been entered into the registry. The impact of these factors is a lower reported prevalence.

## Acknowledgements

The SARR is an initiative of the South African Nephrology Society (http://www.sa-renalsociety.org/) and is chaired by Razeen Davids and Julian Jacobs. The SARR has been incorporated as a non-profit company (company registration no. 2018/401217/08, NPO no. 212-901) with Razeen Davids, Julian Jacobs and Sajith Sebastian as directors. The founding document is available from the South African Nephrology Society.

We thank the doctors, nurses, technologists, support staff and management of participating treatment centres for contributing to the 2020 data collection in very trying circumstances. These centres are listed in Appendix 1. We also thank the sponsors listed below, especially the National Department of Health, for their financial and logistical support:

- Adcock Ingram Critical Care
- Amgen
- Astellas Pharma
- National Department of Health
- National Kidney Foundation of South Africa
- Roche Products
- Stellenbosch University.

## Supplementary materials

The figures in this report are available as PowerPoint slides via the supplementary materials on the *African Journal of Nephrology* website.

## Usage of this report

Extracts from this report, and figures from the accompanying PowerPoint slides, may be freely used and reproduced without requesting permission provided the source is acknowledged. Suggested citation: Davids MR, Jardine T, Marais N, Sebastian S, Jacobs JC. South African Renal Registry Annual Report 2020. African Journal of Nephrology. 2022; 25(1):155-166.

## Conflict of interest

None to declare.

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# APPENDIX 1: PARTICIPATING TREATMENT CENTRES

| EASTERN CAPE | | |
|---|---|---|
| **Public** | **Private** | **Private** |
| Dora Nginza Hospital | B. Braun Avitum Lusikisiki | NRC East London PD |
| Frere Hospital | B. Braun Avitum Matatiele | NRC King Williamstown |
| Livingstone Hospital | B. Braun Avitum Mt Frere | NRC Kwadwesi |
| Nelson Mandela Academic Hospital | B. Braun Avitum Mthatha | NRC Mdantsane |
| | Jeffreys Bay Kidney and Dialysis Centre (FMC) | NRC Mthatha |
| | Life East London Private Hospital | NRC Port Elizabeth HD |
| | Life Mercantile Hospital | NRC Port Elizabeth PD |
| | Living Waters Dialysis Aliwal North | NRC Queenstown |
| | Makhanda Kidney Care | NRC Uitenhage |
| | NRC Alice | Port Elizabeth Kidney and Dialysis Centre (FMC) |
| | NRC Butterworth | Uitenhage Renal Care Centre |
| | NRC East London HD | |

| FREE STATE | | |
|---|---|---|
| **Public** | **Private** | **Private** |
| Boitumelo Regional Hospital (Kroonstad) | B. Braun Avitum Bethlehem (Hoogland) | NRC Bloemfontein HD |
| Bongani Regional Hospital (Welkom) | B. Braun Avitum Bloemfontein | NRC Bloemfontein PD |
| Dihlabeng Regional Hospital (Bethlehem) | B. Braun Avitum Harrismith | NRC Kroonstad |
| Mofumahadi Manapo Mopeli Hospital (Qua Qua) | B. Braun Avitum Welkom | NRC Pelonomi |
| Pelonomi Regional Hospital | Bloemfontein Kidney and Dialysis Centre (FMC) | Pelonomi Regional Hospital |
| Universitas Academic Hospital | Bophelong Busamed Harrismith Hospital | Sasolburg Kidney and Dialysis Centre (FMC) |
| Universitas Private Hospital | Life Rosepark Hospital | Talitha Koum Dialysis |

| GAUTENG | | |
|---|---|---|
| **Public** | **Private** | **Private** |
| Charlotte Maxeke Johannesburg Academic Hospital | Arcadia Kidney and Dialysis Centre (FMC) | Life Groenkloof Hospital |
| Chris Hani Baragwanath Hospital | Atteridgeville Kidney and Dialysis Centre (FMC) | Life Robinson Private Hospital |
| Dr George Mukhari Hospital | B. Braun Avitum Emfuleni (Vanderbijlpark) | Life Springs Parkland Hospital |
| Helen Joseph Hospital | B. Braun Avitum Pretoria (Kloof) | Life The Glynnwood Hospital |
| Leratong Hospital | B. Braun Avitum Sandton | Life Wilgeheuwel Hospital |
| Sebokeng Hospital | B. Braun Avitum Vereeniging | LRC Lenasia |
| Steve Biko Academic Hospital | Botshilu Kidney and Dialysis Centre (FMC) | Mabika Renal Solutions |
| | Carletonville Kidney and Dialysis Centre (FMC) | Midstream Kidney and Dialysis Centre (FMC) |
| | Edison Hammanskraal Centre | Morningside Children's Kidney Treatment Centre |
| | Edison Mamelodi Centre | Morningside Kidney and Dialysis Centre (FMC) |
| | Groenkloof Kidney and Dialysis Centre (FMC) | Naledi Kidney and Dialysis Centre (FMC) |
| | Izinso Dialysis Busamed | Nephromed Kidney Centre Kwa-Thema |
| | Izinso Dialysis Centre Eersterust | Netcare Transplant Centre Garden City Hospital |
| | Izinso Dialysis Garankuwa | Netcare Transplant Centre Jakaranda Hospital |
| | Izinso Dialysis Glen Austin | Netcare Transplant Centre Milpark Hospital |
| | Izinso Dialysis Soshanguve (Pretoria) | NRC Akasia |
| | Izinso Dialysis Soweto | NRC Alberton |
| | Kempton Kidney and Dialysis Centre (FMC) | NRC Arcadia |
| | Lenasia Kidney and Dialysis Centre (FMC) | NRC Johannesburg PD |
| | Lesedi Kidney and Dialysis Centre (FMC) | NRC Krugersdorp |
| | Life Bedford Gardens Hospital | NRC Linksfield |
| | Life Brenthurst Hospital | NRC Lyttleton |
| | Life Fourways Hospital | NRC Mayfair |

Abbreviations: BRC, Busamed Renal Care; FMC, Fresenius Medical Care; LRC, Lenmed Renal Centre; MRC, Melomed Renal Care; NRC, National Renal Care; RCH, Renal Care Holdings.

## APPENDIX 1: PARTICIPATING TREATMENT CENTRES continued

| GAUTENG cont. | | |
|---|---|---|
| **Public** | **Private** | **Private** |
| | NRC Modderfontein | RCH Randfontein |
| | NRC Montana | RCH Zamokuhle (Thembisa) |
| | NRC Mulbarton | Renalworx Dialysis Centre Pretoria West |
| | NRC Olivedale | Renalworx Dialysis Centre Wilgers |
| | NRC Parktown West | Sunshine Dialysis Unit |
| | NRC Pretoria East | Tshepo-Themba Kidney and Dialysis Centre (FMC) |
| | NRC Pretoria PD | Tshwane Kidney and Dialysis Centre (FMC) |
| | NRC Rynfield | Vaal Kidney and Dialysis Centre (FMC) |
| | NRC Sedibeng | Von Wielligh Kidney and Dialysis Centre (FMC) |
| | NRC Sunninghill | Vosloorus Kidney and Dialysis Centre (Clinix) |
| | NRC Sunward Park | Waverley Kidney and Dialysis Centre (FMC) |
| | NRC Waterfall | Westrand Dialysis Randfontein |
| | Pretoria Kidney and Dialysis Centre (FMC) | Westrand Dialysis Westonaria |
| | Q Kidney Care | Westrand Kidney and Dialysis Centre (FMC) |
| | Ramdial Renal Services | Wits Donald Gordon Kidney and Dialysis Centre (FMC) |
| | Randfontein Kidney and Dialysis Centre (FMC) | Wits Donald Gordon Medical Centre Transplant Division |
| | Randfontein Private Hospital Dialysis Unit | |

| KWAZULU-NATAL | | |
|---|---|---|
| **Public** | **Private** | **Private** |
| Addington Hospital | AlphaMed Dialysis | Merediac Durban |
| Greys Hospital | B. Braun Avitum Dundee | Midlands Dialysis and Kidney Centre |
| Inkosi Albert Luthuli Hospital | B. Braun Avitum Durdoc | Mount Edgecombe Dialysis Care Group |
| King Edward VIII Hospital | B. Braun Avitum Ethekwini | Mount Edgecombe Kidney and Dialysis Centre (FMC) |
| Ngwelezana Hospital | B. Braun Avitum Ixopo | Netcare Transplant Centre St Augustine's Hospital |
| St Aidan's Hospital | B. Braun Avitum Newcastle | Newcastle Kidney and Dialysis Centre (FMC) |
| | B. Braun Avitum Pietermaritzburg | NRC Athlone |
| | B. Braun Avitum Scottburgh | NRC Ballito |
| | B. Braun Avitum Vryheid | NRC Berea |
| | BRC Gateway | NRC Chatsworth |
| | BRC Hillcrest | NRC Durban PD |
| | Chatsworth Kidney and Dialysis Centre (FMC) | NRC Margate |
| | Coastal Neprology Centre Nongoma | NRC Pietermaritzburg CBD |
| | Coastal Neprology Centre Ulundi | NRC Pietermaritzburg PD |
| | Dr Parag and Raghubir Kidney Care Centre | NRC Pinetown |
| | Durban Kidney and Dialysis Centre (FMC) | NRC Richards Bay |
| | Ekuphileni Renal Centre Mtubatuba | NRC Umhlanga |
| | Empangeni Kidney and Dialysis Centre (FMC) | Pinetown Kidney and Dialysis Centre (FMC) |
| | Ethekwini Kidney and Dialysis Centre (FMC) | RCH Ladysmith |
| | Hibiscus Kidney and Dialysis Centre (FMC) | RCH Shifa |
| | Kokstad Kidney and Dialysis Centre (FMC) | Renal Care Team Durdoc |
| | Kwazulu Dialysis Shifa Private Hospital | Renal Care Team Kwamashu |
| | Kwazulu Dialysis Umlazi Megacity Renal Unit | Renal Care Team Ladysmith |
| | KZN Nephrology and Dialysis Clinic | Renal Care Team Pinetown |
| | Life Chatsmed Hospital | Richards Bay Kidney and Dialysis Centre (FMC) |
| | Life Empangeni Hospital | Stanger Kidney and Dialysis Centre (FMC) |
| | Life Entabeni Hospital | Ultra Kidney Care City Hospital |
| | Life Hilton Hospital | Umhlanga Kidney and Dialysis Centre (FMC) |
| | Life Mount Edgecombe Hospital | Verulam Dialysis Centre |
| | Life Westville Hospital | Victoria Kidney and Dialysis Centre (FMC) |
| | Mabika Renal Solutions | Vryheid Kidney and Dialysis Centre (FMC) |

Abbreviations: BRC, Busamed Renal Care; FMC, Fresenius Medical Care; LRC, Lenmed Renal Centre; MRC, Melomed Renal Care; NRC, National Renal Care; RCH, Renal Care Holdings.

## APPENDIX 1: PARTICIPATING TREATMENT CENTRES continued

| LIMPOPO | | |
|---|---|---|
| **Public** | **Private** | **Private** |
| Pietersberg Hospital | B. Braun Avitum Louis Trichardt | Medline Dialysis Centre Musina |
| | B. Braun Avitum Mokopane | Nephromed Kidney Centre Elim Hospital |
| | B. Braun Avitum Polokwane | NRC Polokwane |
| | B. Braun Avitum Tzaneen | NRC Thabazimbi |
| | Chantel van Rooyen Bela-Bela | NRC Venda |
| | Edison Giyani Centre | Phalaborwa Kidney and Dialysis Centre (FMC) |
| | Edison Thohoyandou Centre | Thohoyandou Kidney and Dialysis Centre (FMC) |
| | Life Carstenhof Hospital | |

| MPUMALANGA | | |
|---|---|---|
| **Public** | **Private** | **Private** |
| | B. Braun Avitum Ermelo | Life Midmed Hospital |
| | B. Braun Avitum Nelspruit | Middelburg Kidney and Dialysis Centre (FMC) |
| | B. Braun Avitum Trichardt | NRC Nelspruit |
| | B. Braun Avitum Witbank | Supreme Dialysis Barberton |
| | Emalahleni Kidney and Dialysis Centre (FMC) | Supreme Dialysis Malelane |
| | Hazyview Dialysis Centre | Supreme Dialysis Standerton |
| | Highveld Nephrology Centre Bethal | White River Dialysis |
| | Highveld Nephrology Centre Emalahleni | |

| NORTH WEST | | |
|---|---|---|
| **Public** | **Private** | **Private** |
| Job Shimankana Tabane Hospital | B. Braun Avitum Vryburg | North West Dialysis Viljoenskroon |
| Klerksdorp Hospital | Brits Kidney and Dialysis Centre (FMC) | NRC Rustenberg |
| Mafikeng Provincial Hospital | Izinso Dialysis Mafikeng | NRC Lonmin |
| | Living Waters Dialysis Klerksdorp | Potchefstroom Kidney and Dialysis Centre (FMC) |
| | Mafikeng Kidney and Dialysis Centre (FMC) | Rustenburg Kidney and Dialysis Centre (FMC) |
| | North West Dialysis Klerksdorp | Zeerust Renal Unit |
| | North West Dialysis Lichtenburg | |

| NORTHERN CAPE | | |
|---|---|---|
| **Public** | **Private** | **Private** |
| Kimberley State Hospital | B. Braun Avitum Kimberley | North West Dialysis Hartswater |
| | B. Braun Avitum Upington | RCH Kimberley |
| | Kimberley Kidney and Dialysis Centre (FMC) | |

| WESTERN CAPE | | |
|---|---|---|
| **Public** | **Private** | **Private** |
| George Hospital | Athlone Kidney and Dialysis Centre (FMC) | Netcare Transplant Centre Christiaan Barnard Memorial Hospital |
| | B. Braun Avitum Cape Gate | |
| Groote Schuur Hospital | B. Braun Avitum Mossel Bay | NRC Blaauwberg |
| Red Cross War Memorial Children's Hospital | B. Braun Avitum Oudtshoorn | NRC Cape Town CBD |
| Tygerberg Hospital | B. Braun Avitum Worcester | NRC Cape Town PD |
| Worcester Hospital | Cape Town Kidney and Dialysis Centre (FMC) | NRC Eersteriver |
| | George Kidney and Dialysis Centre (FMC) | NRC George |
| | Hermanus Kidney and Dialysis Centre (FMC) | NRC Goodwood |
| | Khayelitsha Kidney and Dialysis Centre (FMC) | NRC Kuilsriver |
| | Life Vincent Pallotti Hospital | NRC Paarl |
| | Life Vincent Pallotti Hospital Paediatrics | NRC Plumstead |
| | MRC Gatesville | NRC Vredenburg |
| | MRC Gatesville PD | Paardevlei Kidney and Dialysis Centre (FMC) |
| | MRC Mitchells Plain | Panorama Kidney and Dialysis Centre (FMC) |
| | MRC Tokai | Rondebosch Dialysis Centre |

Abbreviations: BRC, Busamed Renal Care; FMC, Fresenius Medical Care; LRC, Lenmed Renal Centre; MRC, Melomed Renal Care; NRC, National Renal Care; RCH, Renal Care Holdings.

## APPENDIX 1: PARTICIPATING TREATMENT CENTRES continued

| WESTERN CAPE cont. | | |
|---|---|---|
| **Public** | **Private** | **Private** |
| | Stellenbosch Kidney and Dialysis Centre (FMC) | V & A Waterfront Kidney and Dialysis Centre (FMC) |
| | Stilbaai Kidney and Dialysis Centre (FMC) | Winelands Kidney and Dialysis Centre (FMC) |
| | UCT Kidney and Dialysis Centre (FMC) | Worcester Kidney and Dialysis Centre (FMC) |
| | UCT Private Academic Hospital | |

## APPENDIX 1: PARTICIPATING TRANSPLANT CENTRES

| FREE STATE | |
|---|---|
| **Public** | **Private** |
| | Universitas Private Hospital |

| GAUTENG | |
|---|---|
| **Public** | **Private** |
| Charlotte Maxeke Johannesburg Academic Hospital | Netcare Garden City Hospital |
| Steve Biko Academic Hospital | Netcare Jakaranda Hospital |
| | Netcare Milpark Hospital |
| | Wits Donald Gordon Medical Centre |

| KWAZULU-NATAL | |
|---|---|
| **Public** | **Private** |
| Inkosi Albert Luthuli Hospital | Life Entabeni Hospital |
| | Netcare St Augustine's Hospital |

| WESTERN CAPE | |
|---|---|
| **Public** | **Private** |
| Groote Schuur Hospital | Netcare Christiaan Barnard Memorial Hospital |
| Red Cross War Memorial Children's Hospital | UCT Private Academic Hospital |
| Tygerberg Hospital | |