



SOUTH AFRICAN RENAL REGISTRY Annual Report 2016

MR Davids, T Jardine, N Marais and JC Jacobs

SCIENTIFIC REPORTS AND GUIDELINES

South African Renal Registry Annual Report 2016

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ABSTRACT

The fifth annual report of the South African Renal Registry summarises the 2016 data on renal replacement therapy (RRT) for patients with end-stage renal disease (ESRD) in South Africa. In December 2016, the number of patients with ESRD who were treated with chronic dialysis or transplantation stood at 10 257, a prevalence of 183 per million population (pmp). The growing prevalence observed since the registry was established is due mainly to the increasing numbers of patients accessing haemodialysis in the private sector. In the public sector, which serves 84% of the South African population, the prevalence of RRT (68 pmp) has dipped below the level reported for 1994, so that the disparity in access continues to increase. The disparities between provinces remain, with Limpopo and Mpumalanga the most under-served, as do the disparities between ethnic groups, with Blacks being the most under-served group.

Keywords: renal registry; South Africa; haemodialysis; peritoneal dialysis; transplantation.

INTRODUCTION

The South African Renal Registry (SARR) collects, analyses and publishes information on the treatment of patients with end-stage renal disease (ESRD) in South Africa on behalf of the South African Renal Society. This is the fifth consecutive annual report published by the SARR, which summarises the December 2016 data on renal replacement therapy (RRT) for patients with ESRD in South Africa.

METHODS

Registry platform

Since the inception of the SARR, our technology platform has undergone several major iterations, all aimed at making data entry simpler and faster. Our current platform has been developed using the Webdev programming environment (www.windev.com) and resides on a secure, dedicated, Windows 10 server at a leading 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 that has internet access. Password protection ensures that treatment centres have access to their own data only. Data files are backed up daily using a specialist online backup company. Incremental backups of the registry application are also made daily and the full application is backed up weekly.

Over the past two years, the technology platform of the SARR has been expanded to serve as the basis for the newly-established African Renal Registry. Burundi, Ghana, Kenya and Zambia have formally joined the African Renal Registry and have started data collection with the aid of our platform [1,2].

Definitions

ESRD and start date of RRT. ESRD refers to advanced, irreversible, chronic kidney disease (CKD) which requires the initiation of RRT. 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 RRT, the start date is the date of the first dialysis, even though the diagnosis at that time was AKI and not ESRD.

Initial RRT modality. This is the intended first modality and should normally be the modality being used on day 91 of RRT. 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 should not be done for short-term transfers when the intention is that the patient will return to the “home” unit, e.g. for holiday dialysis, temporary transfer to a unit with isolation facilities, etc.

Primary renal diagnosis. Responsible nephrologists/physicians should assist their data-capturers to ensure that this critical information is accurate. We are using the set of renal diagnosis codes of the ERA-EDTA [3] and have mapped all previous entries to these codes. If there is uncertainty about the renal diagnosis, as is often the case with patients who present late, then the primary renal diagnosis should be indicated as “**chronic kidney disease (CKD) – aetiology uncertain/unknown**”. In patients who present with ESRD, small kidneys and hypertension there should not be an automatic default to labelling such patients as having “chronic glomerulonephritis” or “hypertensive renal disease”.

Chronic hypertensive nephropathy or malignant hypertensive nephropathy. This should be selected as the primary renal diagnosis 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 renal dysfunction, left ventricular hypertrophy, proteinuria <2 g/day, and no evidence of other renal diseases [4,5].

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, 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 renal function. These are patients who have been initiated on chronic HD/PD and who no longer require dialysis. 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 RRT (even within the same year), there should be an END entry for the initial period of RRT and then a new entry recorded for the patient when he/she starts the second period of RRT, i.e., there will be two registry entries for the same patient.

Laboratory methods

Assays for serum albumin concentrations by the different laboratories all have reference ranges of 35–52 g/L. In the public sector, the National Health Laboratory Service (NHLS) uses the bromocresol green (BCG) method on Roche platforms. In the private sector, Lancet Laboratories uses BCG on Roche platforms, Ampath Laboratories uses BCG on Abbott Architect platforms, and PathCare uses BCG on Beckman platforms.

Ethics approval

The SARR operates as a longitudinal study with ethics 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 country-wide data collection on adults and children, 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.

RESULTS

South Africa in 2016

According to the Stats SA mid-year estimates for 2016 [6], the population of South Africa increased by nearly one million from the previous year, to 55.91 million people. The province of Gauteng is home to almost one-quarter of the population (24.1%). There is a slight female predominance (51.0%). Black/African citizens constitute 80.7% of the population, with people of mixed ethnicity (Coloured) making up 8.8%, Whites 8.1% and Indians/Asians 2.5%.

South Africa is classified as an upper-middle-income country by the World Bank, with a GNI per capita by the Atlas method (current US\$) of \$5 490 and by the purchasing power parity (PPP) method (current international US\$) of \$12 880. Most of the population (84%) rely on the

public health sector for services, with only a small proportion (16%) having medical insurance and accessing private sector healthcare [7].

Life expectancy at birth for 2016 is estimated at 59.7 years for males and 65.1 years for females. The infant mortality

rate for 2016 is estimated at 33.7 per 1 000 live births. The estimated overall HIV prevalence is approximately 12.7%, and 18.9% for adults aged 15–49 [6].



Figure 1. Provinces and major cities of South Africa.

Table 1. Population data by ethnic group.

Population group	Million	%
Black	45.11	80.7
Coloured	4.90	8.8
Indian/Asian	1.37	2.5
White	4.52	8.1
Total	55.91	100

Table 2. Population data by province.

Province	Million	%
Eastern Cape (EC)	7.06	12.6
Free State (FS)	2.86	5.1
Gauteng (GT)	13.50	24.1
KwaZulu-Natal (KZN)	11.08	19.8
Limpopo (LP)	5.80	10.4
Mpumalanga (MP)	4.33	7.7
North West (NW)	3.80	6.8
Northern Cape (NC)	1.19	2.1
Western Cape (WC)	6.29	11.3
Total	55.91	100

Treatment centres for dialysis and transplantation

The number of centres contributing data in 2016 was 260; 230 (88.5%) of these are privately owned. One privately owned unit in Limpopo was established as a public–private partnership on the premises of a government hospital to serve public sector patients.

Sector	EC	FS	GT	KZN	LP	MP	NW	NC	WC	All
Public	3	6	7	5	0	0	3	1	5	30
Private	18	13	67	61	13	11	11	4	32	230
Total	21	19	74	66	13	11	14	5	37	260

Prevalence of renal replacement therapy

The total number of patients on RRT on 31 December 2016 was 10 257. This is a prevalence of 183 per million population (pmp). The slightly lower numbers compared to 2015 can be at least partly ascribed to concerted efforts to improve the reporting of deaths. For example, with the assistance of the South African Medical Research Council, we checked the patients with valid identity document numbers against the deaths database of the Department

of Home Affairs. The province with the highest patient numbers remains Gauteng, followed by the Western Cape and KwaZulu-Natal, whereas the province with the highest prevalence is the Western Cape, followed by Gauteng and the Free State.

There were 1 472 patients who started RRT in 2016, an incidence of 26 pmp. Most of these patients (86%) received RRT in private centres.

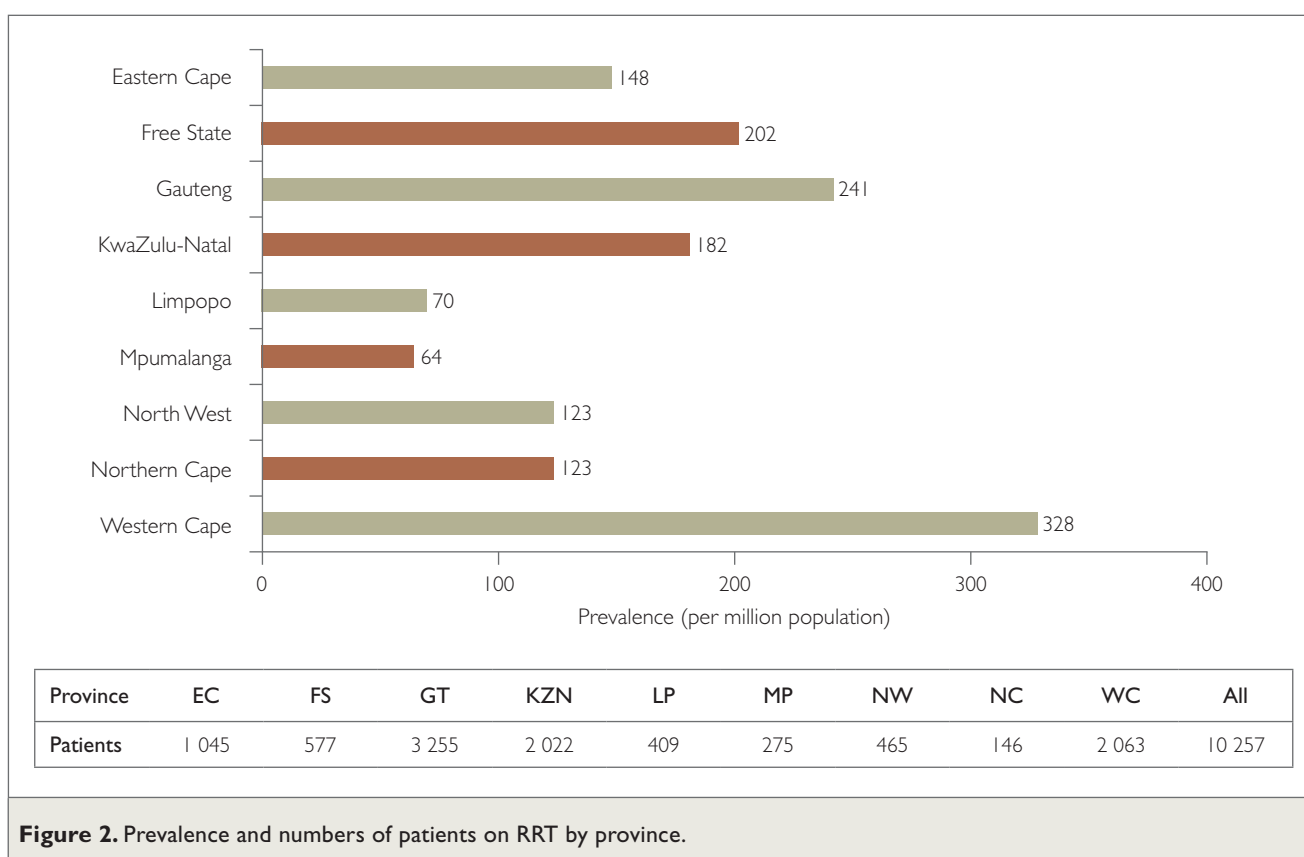


Figure 2. Prevalence and numbers of patients on RRT by province.

The number of patients treated in the public sector remains low, with a prevalence of 67.5 pmp. This is lower than the 70 pmp reported for 1994, when most of the chronic dialysis and transplantation was delivered in the public sector. In the private sector, the rate for 2016 is 797.5 pmp. Denominators for prevalence calculations are based on the Stats SA mid-term estimates [6] and the Council for Medical Schemes Annual Report [7]. Medical aid beneficiaries who are unclassified with respect to province were allocated to provinces in proportion to the numbers of beneficiaries in each province.

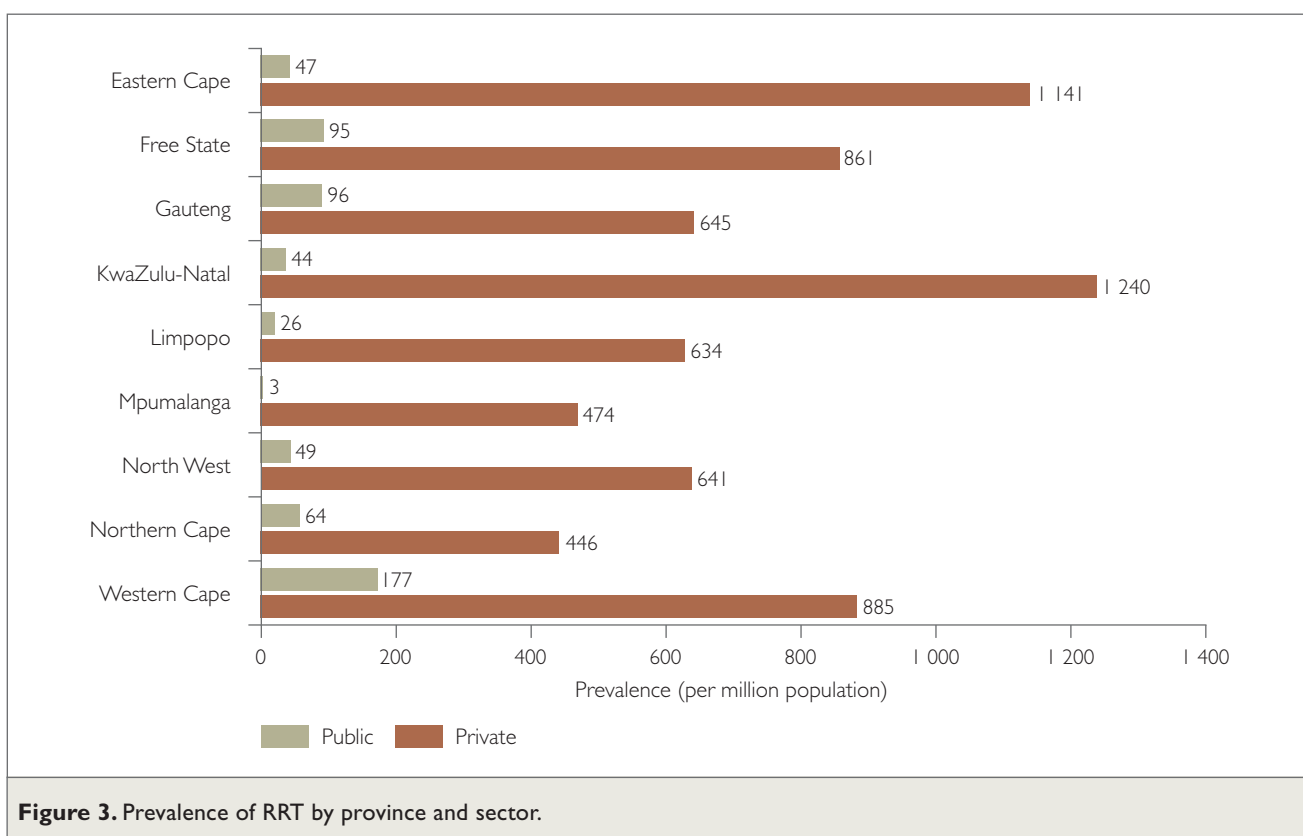
Table 4. RRT prevalence by healthcare sector.

	Public	Private
Population in millions	47.03	8.88*
ESRD patients on treatment	3 175	7 082
Treatment rate (pmp)	67.5	797.5

*Council for Medical Schemes Annual Report 2016/17

Table 5. Numbers of patients by sector and province.

Sector	EC	FS	GT	KZN	LP	MP	NW	NC	WC	All
Public	299	235	957	431	141	10	162	64	876	3 175
Private	746	342	2 298	1 591	268	265	303	82	1 187	7 082
Total	1 045	577	3 255	2 022	409	275	465	146	2 063	10 257



Treatment modality

Of the 10 257 patients on RRT in December 2016, 13.9% had a functioning renal transplant. Of the 8 832 patients on dialysis, 14.8% were on peritoneal dialysis and 85.2% on haemodialysis. Most of the transplant and peritoneal dialysis patients are in the public sector; the private sector has much lower proportions of patients on these RRT modalities.

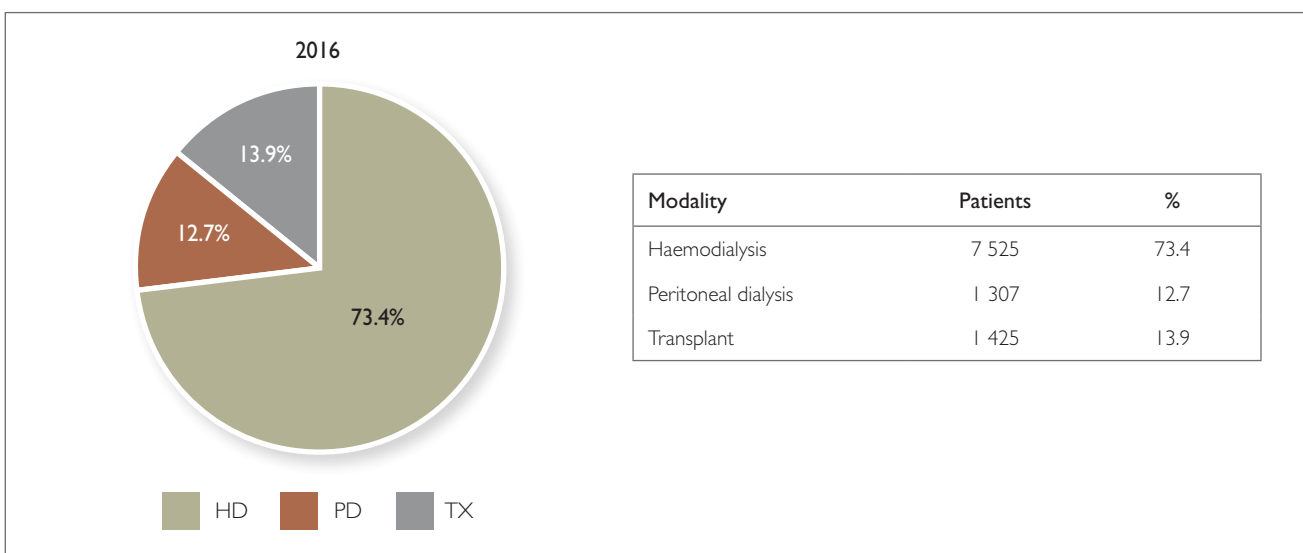


Figure 4. Distribution of patients by treatment modality.

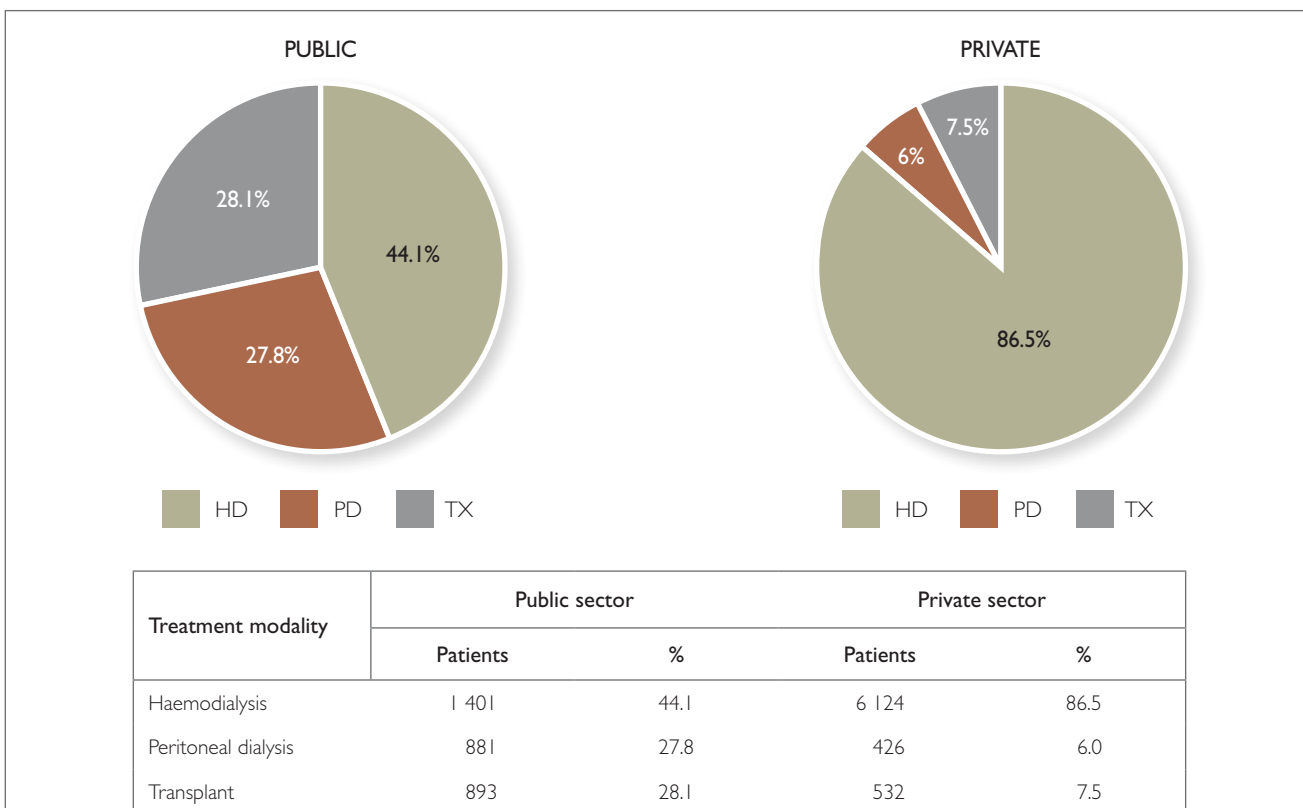


Figure 5. RRT modality by sector.

Data on new kidney transplants have been supplied by the South African Organ Donor Foundation (<http://www.odf.org.za>). The decline in the number of new transplants seen in 2014 (219 transplants) appears to have been reversed, with 261 transplants performed in 2015 and

254 in 2016. The 2016 data include 4 kidney-liver and 1 kidney-pancreas transplants. The kidney transplant rate for 2016 was 4.5 pmp.

Table 6. New kidney transplants in 2016.

	Deceased donor		Living related		Living unrelated		Total
	Child	Adult	Child	Adult	Child	Adult	
Western Cape - Public	3	38	1	16	0	3	61
Western Cape - Private	0	22*	0	25	0	9	56
Gauteng - Public	3	25	0	4	0	0	32
Gauteng - Private	3**	30***	5	20	0	11	69
KwaZulu-Natal - Public	0	0	0	9	0	0	9
KwaZulu-Natal - Private	1	11	0	10	0	3	25
Free State - Public	0	0	0	0	0	0	0
Free State - Private	0	0	0	2	0	0	2
Total	10	126	6	86	0	26	254

Child = recipient <18 years; Adult = recipient 18 years and older.
 *Includes 1 adult kidney-liver transplant. **Includes 1 child kidney-liver transplant. ***Includes 2 adult kidney-liver transplants and 1 adult kidney-pancreas transplant.
 The kidney transplant rate for 2016 was 4.5 pmp. Data supplied by the SA Organ Donor Foundation.

Demographic and clinical data

The mean age of the patients on RRT was 51.5 ± 14.9 years and 59.2% were male. Because of the rationing and selection criteria applied in South African public sector hospitals, patients treated there are much younger than those treated in the private sector (43.4 ± 13.4 versus 55.2 ± 14.2 years). Just more than half of the patients were Black. However, the prevalence was still lowest in Blacks (124 pmp) and highest in Indians/Asians (853 pmp).

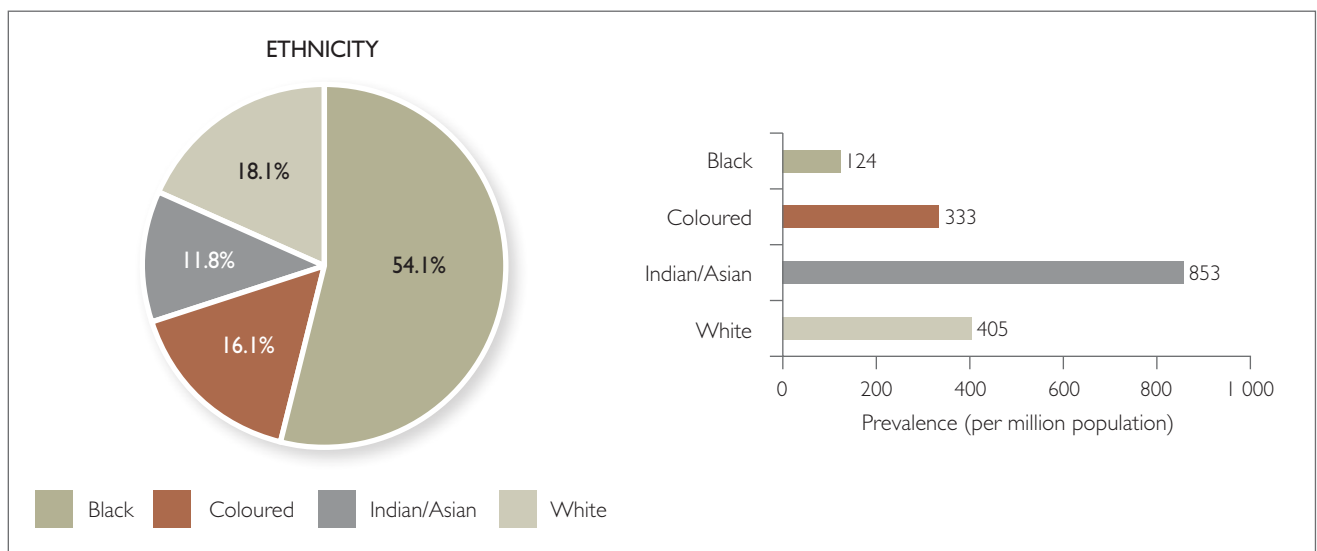


Figure 6. RRT patient numbers and prevalence by ethnicity.



Since 2015, we have been using the new EDTA-ERA coding system for primary renal diagnosis [3]. The most commonly reported diagnosis is hypertensive renal disease, followed by CKD/ESRD of unknown cause and diabetic nephropathy.

	% of total
Hypertensive renal disease	34.7
Cause unknown	32.4
Diabetic nephropathy	15.2
Glomerular disease	9.9
Cystic kidney disease	3.0
Obstruction and reflux	1.7

Of the 9 754 patients with data on diabetes status, 38.7% were diabetic, with a much higher percentage of diabetic patients in the private than in the public sector (49.6% versus 14.9%). The seropositive rate for hepatitis B virus was 1.9% (161 of 8 630 patients), for hepatitis C virus 0.8% (64 of 7 737 patients) and for HIV 10.6% (863 of 8 172 patients).

DISCUSSION

The number of patients on RRT in South Africa stood at 10 257 in 2016, a prevalence of 183 pmp. Most of the patients are being treated with haemodialysis in the private healthcare sector. There is no evidence of any real growth in public sector access to RRT. On the contrary, treatment rates have dropped below those seen in 1994. The RRT prevalence in South Africa is very low when compared with other countries with similar or smaller gross national incomes per capita [8]. The number of new patients starting RRT each year is also very low, and is the lowest of any country included in the International Comparisons chapter of the latest US Renal Data System report [8]. The progressive realisation of access to treatment, which is promised by the South African Constitution, is not happening, and this remains cause for great concern.

Acknowledgements

The SARR is an initiative of the South African Renal Society (<http://www.sa-renalsociety.org/>) and is chaired by Razeen Davids and Julian Jacobs. The SARR has recently 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 can be accessed via the website of the South African Renal Society.

We thank the doctors, nurses, technologists, support staff and management of participating treatment centres for

contributing to the success of our 2016 data collection. 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:

- Actor Pharma
- Adcock Ingram Critical Care (Renal Division)
- Amgen
- Janssen
- National Department of Health
- National Kidney Foundation of South Africa
- Stellenbosch University
- Zydus Healthcare

Our national data manager, Nicola Marais, and data capturer, Suzan Baloyi.

Supplementary materials

The figures in this report are available as PowerPoint slides via the supplementary materials.

Usage of this report

Extracts from this report, and figures from the accompanying PowerPoint slides, may be freely used and reproduced without permission provided the source is acknowledged. Suggested citation: Davids MR, Jardine T, Marais N, Jacobs JC. South African Renal Registry Annual Report 2016. *African Journal of Nephrology*. 2018; 21(1):61-72. Previous reports are available at <http://www.sa-renalsociety.org/registry.asp>.

Conflict of interest

None to declare.

REFERENCES

1. Davids MR, Caskey FJ, Young T, Balbir Singh GK. Strengthening renal registries and ESRD research in Africa. *Semin Nephrol*. 2017; 37:211-223.
2. Davids MR, Eastwood JB, Selwood NH, Arogundade FA, Ashuntantang G, Benghanem Gharbi M, et al. A renal registry for Africa: first steps. *Clin Kidney J*. 2016; 9:162-167.
3. Venkat-Raman G, Tomson CR, Gao Y, Comet R, Stengel B, Gronhagen-Riska C, et al. New primary renal diagnosis codes for the ERA-EDTA. *Nephrol Dial Transplant*. 2012; 27:4414-4419.
4. Pemeger TV, Whelton PK, Klag MJ, Rossiter KA. Diagnosis of hypertensive end-stage renal disease: effect of patient's race. *Am J Epidemiol*. 1995; 141:10-15.
5. Schlessinger SD, Tankersley MR, Curtis JJ. Clinical documentation of end-stage renal disease due to hypertension. *Am J Kidney Dis*. 1994; 23:655-660.
6. Mid-year population estimates, 2016. Pretoria: Statistics South Africa.
7. Council for Medical Schemes Annual Report 2016/17. Pretoria, South Africa: Council for Medical Schemes.
8. United States Renal Data System 2018 Annual Data Report. Bethesda, MD: National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases.

APPENDIX I: PARTICIPATING TREATMENT CENTRES

EASTERN CAPE		
Public	Private	Private
Frere Hospital	Jeffreys Bay Kidney and Dialysis Centre (FMC)	NRC Mthatha
Livingstone Hospital	Life Mercantile Hospital	NRC Port Elizabeth HD
Nelson Mandela Academic Hospital	Living Waters Dialysis Alival North	NRC Port Elizabeth PD
	NRC Butterworth	NRC Queenstown
	NRC East London HD	NRC Uitenhage
	NRC East London PD	Port Elizabeth Kidney and Dialysis Centre (FMC)
	NRC King Williamstown	Regional Renal Services Lusikisiki
	NRC Kwadwesi	Regional Renal Services Matatiele
	NRC Mdantsane	Regional Renal Services Mthatha
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 Welkom	NRC Kroonstad
Mofumahadi Manapo Mopeli Hospital (Qua Qua)	Bloemfontein Kidney and Dialysis Centre (FMC)	NRC Pelonomi
Pelonomi Regional Hospital	Graham and Kolff Renal Therapy Thaba Nchu	Sasolburg Kidney and Dialysis Centre (FMC)
Universitas Academic Hospital	Life Rosepark Hospital	Universitas Private Hospital
	Living Waters Dialysis Hoopstad	
GAUTENG		
Public	Private	Private
Charlotte Maxeke Johannesburg Academic Hospital	Arcadia Kidney and Dialysis Centre (FMC)	LRC Lenasia (Lenmed)
Chris Hanu Baragwanath Hospital	Atteridgeville Kidney and Dialysis Centre (FMC)	LRC Lenasia South (Daxina)
Dr George Mukhari Hospital	B. Braun Avitum Lakeview (Benoni)	Mabika Renal Solutions
Helen Joseph Hospital	B. Braun Avitum Pretoria (Kloof)	Midstream Kidney and Dialysis Centre (FMC)
Leratong Hospital	B. Braun Avitum Pretoria (Urology Hospital)	Morningside Children's Kidney Treatment Centre
Sebokeng Hospital	B. Braun Avitum Sandton	Morningside Kidney and Dialysis Centre (FMC)
Steve Biko Academic Hospital	B. Braun Avitum Vanderbijlpark (Emfuleni)	Morula Kidney and Dialysis Centre (FMC)
	B. Braun Avitum Vereeniging (Midvaal)	Naledi Kidney and Dialysis Centre (FMC)
	Carletonville Kidney and Dialysis Centre (FMC)	Netcare Transplant Centre Garden City Hospital
	Edison Hammanskraal Centre	Netcare Transplant Centre Jakaranda Hospital
	Groenkloof Kidney and Dialysis Centre (FMC)	Netcare Transplant Centre Milpark Hospital
	Harmelia Kidney and Dialysis Centre (FMC)	NRC Akasia
	Izinso Dialysis Garankuwa	NRC Alberton
	Izinso Dialysis Soshanguve (Pretoria)	NRC Arcadia
	Izinso Dialysis Soweto	NRC Johannesburg PD
	Kempton Kidney and Dialysis Centre (FMC)	NRC Krugersdorp
	Lanika Nursing Home and Dialysis Centre	NRC Linksfield
	Lenasia Kidney and Dialysis Centre (FMC)	NRC Lyttleton
	Lesedi Kidney and Dialysis Centre (FMC)	NRC Mayfair
	Life Bedford Gardens Hospital	NRC Montana
	Life Carstenhof Hospital	NRC Mulbarton
	Life Fourways Hospital	NRC Olivedale
	Life The Glynnwood Hospital	NRC Parktown West

Abbreviations: FMC = Fresenius Medical Care, LRC = Lenmed Renal Centre, MRC = Melomed Renal Care, NRC = National Renal Care

APPENDIX I: PARTICIPATING TREATMENT CENTRES continued

GAUTENG cont.		
Public	Private	Private
	NRC Pretoria East	RCH Zamokuhle (NRC) (Thembisa)
	NRC Pretoria PD	Renalworx Dialysis Centre Wilgers
	NRC Rynfield	Tshepo-Themba Kidney and Dialysis Centre (FMC)
	NRC Sebokeng	Tshwane Kidney and Dialysis Centre (FMC)
	NRC Sedibeng	Vaal 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 Kidney and Dialysis Centre (FMC)
	Pretoria Kidney and Dialysis Centre (FMC)	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	B. Braun Avitum Dundee	Newcastle Kidney and Dialysis Centre (FMC)
Greys Hospital	B. Braun Avitum Durdoc	NRC Athlone
Inkosi Albert Luthuli Hospital	B. Braun Avitum Ethekwini	NRC Ballito
King Edward VIII Hospital	B. Braun Avitum Howick	NRC Berea
Ngwelezana Hospital	B. Braun Avitum Newcastle	NRC Chatsworth
	B. Braun Avitum Pietermaritzburg	NRC Durban PD
	B. Braun Avitum Scottburgh	NRC Gateway
	B. Braun Avitum Vryheid	NRC Greyville
	Chatsworth Kidney and Dialysis Centre (FMC)	NRC Hillcrest
	Coastal Nephrology Centre Greytown	NRC Ladysmith
	Coastal Nephrology Centre Nongoma	NRC Margate
	Coastal Nephrology Centre Ulundi	NRC Pietermaritzburg CBD
	Durban Kidney and Dialysis Centre (FMC)	NRC Pietermaritzburg PD
	Ekuphileni Renal Centre Manguzi	NRC Pinetown
	Empangeni Kidney and Dialysis Centre (FMC)	NRC Richards Bay
	Ethekwini Kidney and Dialysis Centre (FMC)	NRC Umhlanga
	Hibiscus Kidney and Dialysis Centre (FMC)	Pinetown Kidney and Dialysis Centre (FMC)
	Kokstad Kidney and Dialysis Centre (FMC)	Regional Renal Services Harding
	Kwazulu Dialysis Shifa Renal Unit	Regional Renal Services Ixopo
	Kwazulu Dialysis Umlazi Megacity Renal Unit	Renal Care Team Durdoc
	Kwazulu Dialysis Westville Renal Unit	Renal Care Team Kwamashu
	Life Chatsmed Hospital	Renal Care Team Pinetown
	Life Empangeni Hospital	Richards Bay Kidney and Dialysis Centre (FMC)
	Life Entabeni Hospital	Sparks Renal Unit
	Life Hilton Hospital	Stanger Kidney and Dialysis Centre (FMC)
	Life Mount Edgecombe Hospital	Ultra Kidney Care Isipingo
	Merédiac Durban	Umhlanga Kidney and Dialysis Centre (FMC)
	Merédiac Pinetown	Verulam Dialysis Centre
	Mount Edgecombe DCG	Victoria Kidney and Dialysis Centre (FMC)
	Mount Edgecombe Kidney and Dialysis Centre (FMC)	Vryheid Kidney and Dialysis Centre (FMC)
	Netcare Transplant Centre St Augustine's Hospital	

Abbreviations: FMC = Fresenius Medical Care, LRC = Lenmed Renal Centre, MRC = Melomed Renal Care, NRC = National Renal Care

APPENDIX I: PARTICIPATING TREATMENT CENTRES continued

LIMPOPO		
Public	Private	Private
	B. Braun Avitum Louis Trichardt	Hope Renal Care and Dialysis
	B. Braun Avitum Mokopane	NRC Polokwane
	B. Braun Avitum Polokwane	NRC Venda
	B. Braun Avitum Tzaneen	Phalaborwa Kidney and Dialysis Centre (FMC)
	Chantel van Rooyen Bela-Bela	Polokwane Kidney and Dialysis Centre (FMC)
	Edison Giyani Centre	Thohoyandou Kidney and Dialysis Centre (FMC)
	Edison Thohoyandou Centre	
MPUMALANGA		
Public	Private	Private
	B. Braun Avitum Ermelo	Highveld Nephrology Center
	B. Braun Avitum Nelspruit	Life Midmed Hospital
	B. Braun Avitum Trichardt	Middelburg Kidney and Dialysis Centre (FMC)
	B. Braun Avitum Witbank	Mpumalanga Kidney and Dialysis Centre (FMC)
	Emalaheni Kidney and Dialysis Centre (FMC)	NRC Nelspruit
	Hazyview Dialysis Centre	
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 Hospital	Izinso Dialysis Mafikeng	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 Hospital	B. Braun Avitum Kimberley	North West Dialysis Hartswater
	B. Braun Avitum Upington	RCH Kimberley (NRC)
WESTERN CAPE		
Public	Private	Private
George Hospital	Athlone Kidney and Dialysis Centre (FMC)	NRC Cape Town CBD
Groote Schuur Hospital	B. Braun Avitum Cape Gate	NRC Cape Town PD
Red Cross War Memorial Children's Hospital	B. Braun Avitum Mossel Bay	NRC George
Tygerberg Hospital	B. Braun Avitum Oudtshoorn	NRC Goodwood
Worcester Hospital	B. Braun Avitum Worcester	NRC Kuilsriver
	Cape Town Kidney and Dialysis Centre (FMC)	NRC Paarl
	George Kidney and Dialysis Centre (FMC)	NRC Plumstead
	Hermanus Kidney and Dialysis Centre (FMC)	NRC Vredenburg
	Khayelitsha Kidney and Dialysis Centre (FMC)	Paardevelei Kidney and Dialysis Centre (FMC)
	Life Vincent Pallotti Hospital	Panorama Kidney and Dialysis Centre (FMC)
	Life Vincent Pallotti Hospital Paediatrics	Rondebosch Dialysis Centre
	MRC Gatesville HD	Stellenbosch Kidney and Dialysis Centre (FMC)
	MRC Gatesville PD	UCT Kidney and Dialysis Centre (FMC)
	MRC Mitchells Plain	UCT Private Academic Hospital
	MRC Tokai	Winelands Kidney and Dialysis Centre (FMC)
	NRC Blaauwberg	Worcester Kidney and Dialysis Centre (FMC)

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APPENDIX I: 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	