

Kidney Transplant Activity New Zealand

2020 Calendar Year

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Data Collection

Data is provided directly to the National Renal Transplantation Service (NRTS) from Clinical Directors at the three Transplanting District Health Boards (DHBs), and from individual units via the Australian and New Zealand Dialysis and Transplantation Registry (ANZDATA), and checked against donation data provided by New Zealand Blood and Organ Service.

Kidney Transplants in 2020

There were 187 recipients of kidney transplants in New Zealand in 2020.

These included 87 living donor and 100 deceased donor kidney transplant recipients. Three deceased donor recipients received a dual transplant (two kidneys each from a single deceased donor). There were 24 living donor kidney transplants as part of kidney exchanges.

Despite significant challenges related to the COVID-19 pandemic, this is the second largest total number of kidney transplant recipients in New Zealand in a calendar year (equal with 2017). The largest total was 221 in 2019.

At the estimated population of 5.03 million (StatsNZ at 30 June 2020), the total kidney transplant rate was 37.2 per million population (pmp). This is a significant reduction on the record in 2019 (44.9 pmp).

The three DHBs that provide kidney transplant procedures are in Auckland, Wellington and Christchurch. Services are arranged geographically around the transplant centres, with client DHBs referring most patients to their nearest transplant centre (see appendix). Numbers of transplants performed in each centre are provided in table 1.

Table 1: Transplant Characteristics by Transplant Centre

	Auckland	Wellington	Christchurch	Overall	Pmp
Kidney Transplants	122	35	30	187	37.2
Deceased donor, n (%)	75(61)	16(46)	9(30)	100(53)	19.9
Living donor, n (%)	47(39)	19(54)	21(70)	87(47)	17.3

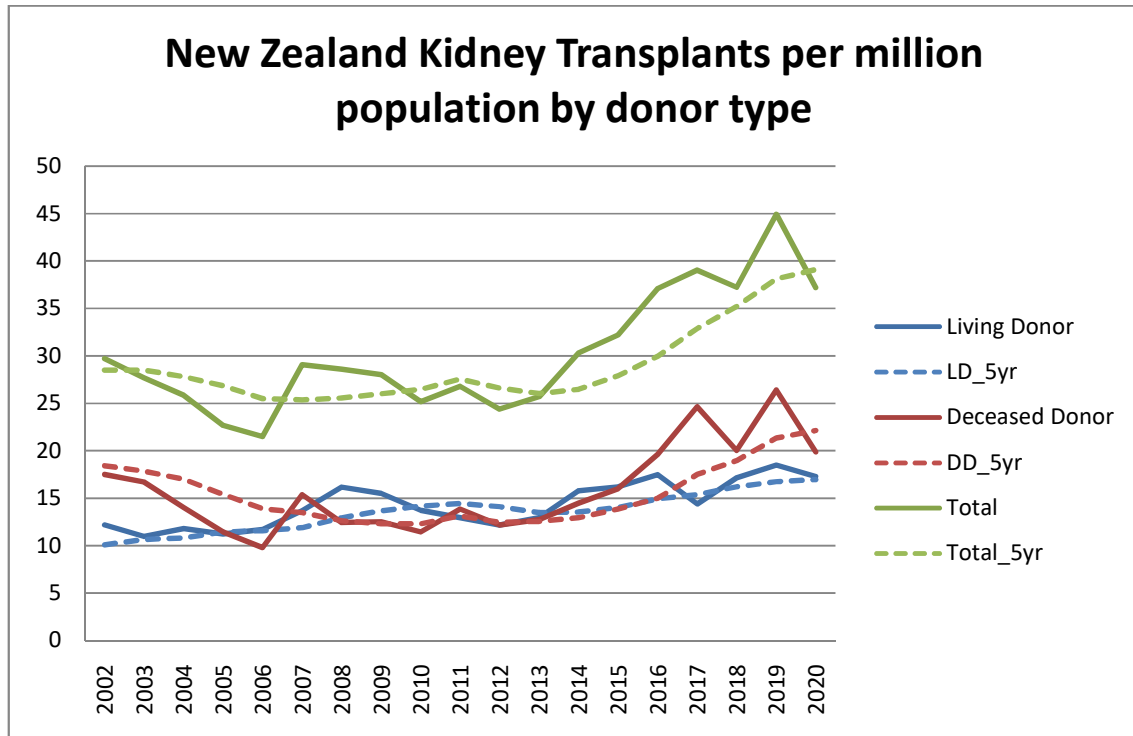


Figure 1: New Zealand Kidney Transplant Rate per million population 2002-2020, by donor source (annual and 5 year rolling average)

There has been an overall increase in the total kidney transplant rate per million population since 2013, as represented by the five year moving average, with year by year variability (figure 1). There is the suggestion that the rate of increase has slowed in recent years, although 2020 was significantly affected by the COVID-19 global pandemic.

COVID-19 Effects on NZ Kidney Transplantation Activity

Kidney transplantation, along with many other aspects of health service delivery, was affected by the COVID-19 level 4 national lockdown in the autumn of 2020. The lockdown began at the start of March and was lifted progressively in June.

Each transplant unit remained open and available for deceased donor transplantation during the lockdown, except for Wellington during a three week period (23/3/20-12/4/2020), due to concerns about definite availability of support services.

Despite ongoing need and availability of the usual resources, live and deceased donor activity was severely curtailed.

During the calendar months affected by the national lockdown (March-June), there were an average of 4.0 deceased donor kidney transplants and 4.5 live donor transplants per month. For the remaining months, the average was 10.5 (deceased donor) and 8.6 per month.

Assessment of future live organ donors and potential recipients was significantly affected may lead to delayed effects on kidney transplantation activity in 2021.

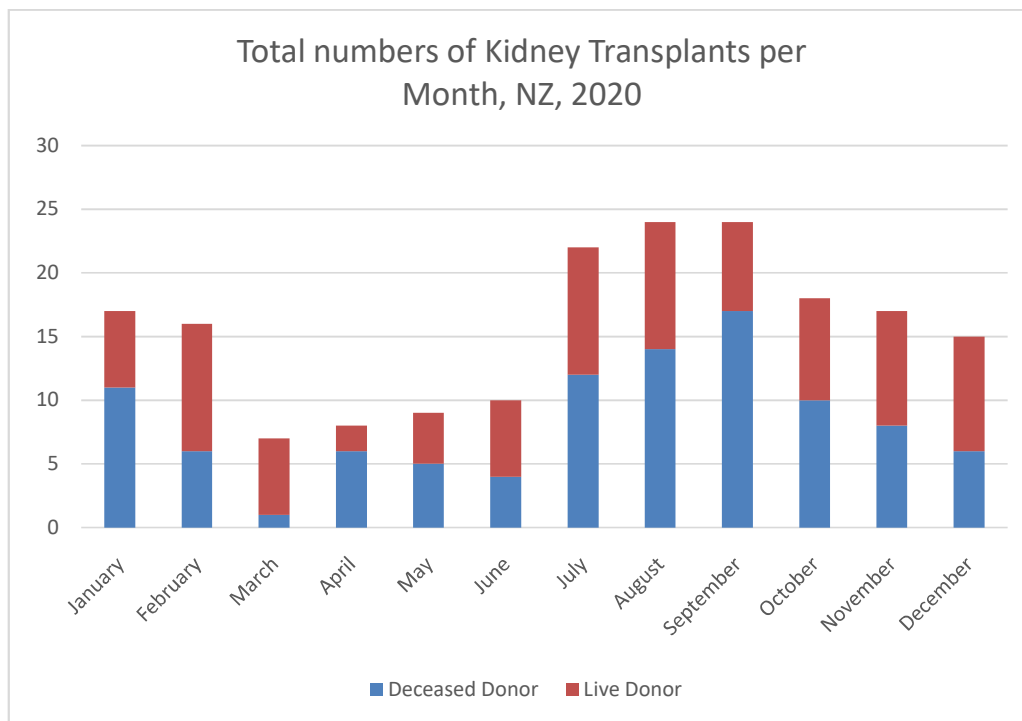


Figure 2: Effect of COVID-19 Lockdown on Kidney Transplantation in New Zealand, 2020

Transplants per 100 End Stage Kidney Disease Patients in NZ

We present transplants per 100 cumulative incident end stage kidney disease patients at 31 December for the year prior (iESKD). These are patients commencing chronic dialysis or having a kidney transplant as their first treatment for end stage kidney disease in the 12-month period to 31 December of the year prior, as reported by ANZDATA in 2019*.

Overall, there were 29 kidney transplants in 2020 per 100 iESKD patients in New Zealand in 2019, the lowest number in the last five years. Overall, this measure has increased in the last ten years, despite a steady and significant increase (around 25%) in iESKD patients (table 3).

Table 3: NZ Numbers of transplants per 100 Incident End Stage Kidney Disease (iESKD) Patients, 2012-2019

Year	iESKD Pts (31 Dec year prior)	Transplants per 100 iESKD patients
2012	489	21
2013	524	22
2014	559	25
2015	557	26
2016	565	30
2017	582	32
2018	623	29
2019	625	35
2020	656	29

In Figure 3 this information is presented graphically by donor source (live donor and deceased donor).

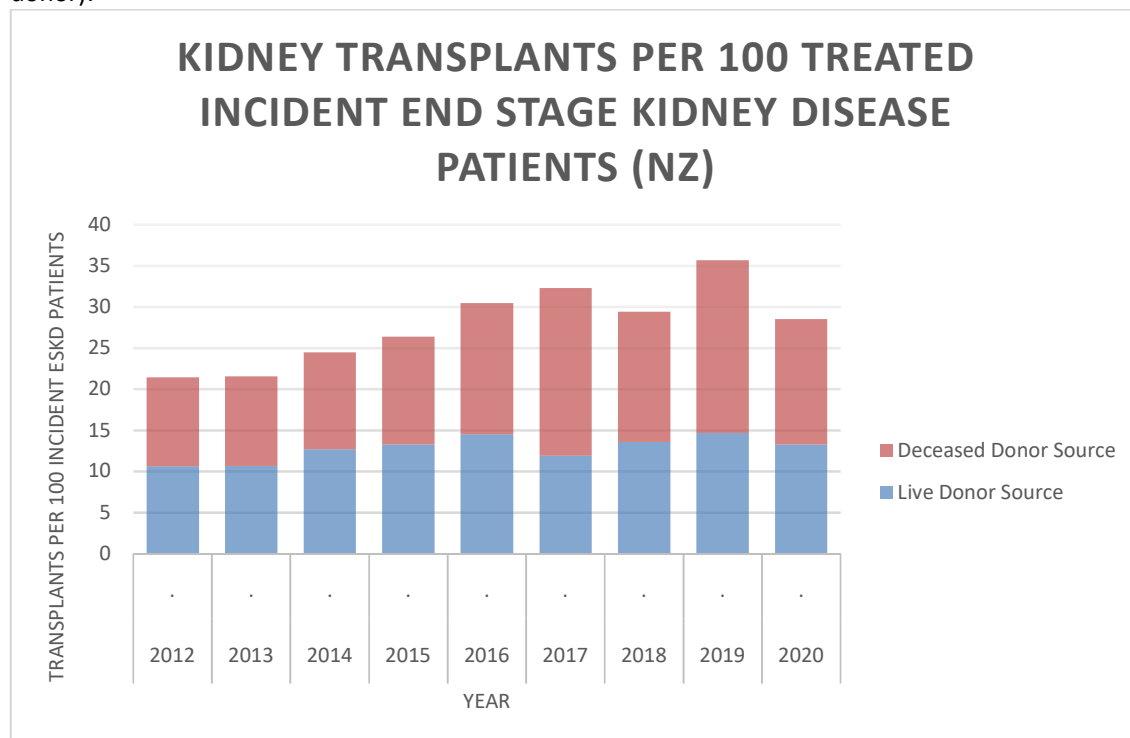


Figure 3: Kidney Transplants per 100 Treated Incident End Stage Kidney Disease Patients 2012-2020, New Zealand

Kidney transplantation and ethnicity in New Zealand

Kidney transplantation varies by ethnicity in New Zealand. The reasons for this variability may relate to socioeconomic, geographic, clinical and demographic determinants of suitability and ability to access transplantation that vary between ethnic groups. The data presented here are unadjusted for these confounders, so comparisons between groups are likely to be flawed.

Rates of kidney transplantation per 100 incident end stage kidney disease patients (iESKD) are presented for three groups, Māori, Pacific and Asian people, compared to the overall rate in New Zealand, by year between 2014 and 2020 (figure 3).

Transplant rates are increasing to a similar degree across all groups. This may suggest that improvements in access have been similarly distributed by ethnicity.

In 2020, among Maori, there were 21 transplants per 100 incident ESKD patients, more than 20 for the first time, with 39 Maori patients receiving kidney transplants.

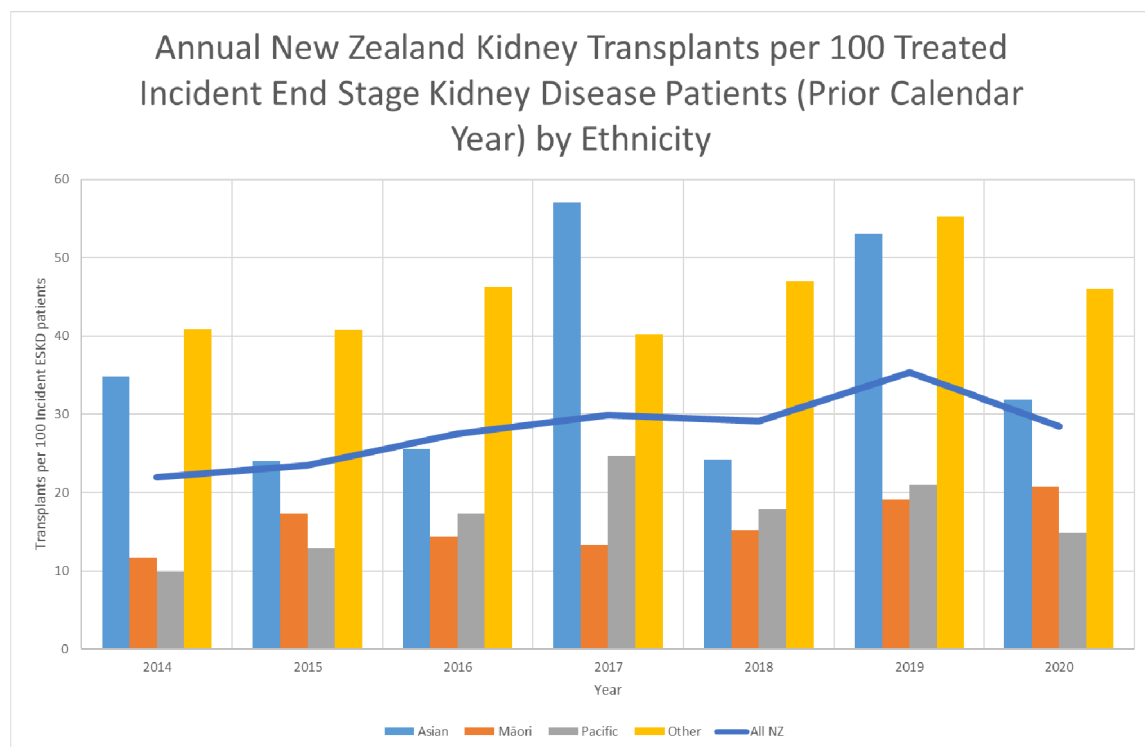


Figure 4: Annual Kidney Transplants per 100 treated incident end stage kidney disease patients (prior calendar year) by ethnicity, 2014-2020

Donor source varies by the ethnicity of the recipient, with Maori and particularly Pacific transplanted patients more likely to have received a deceased donor kidney than a live donor kidney. This may at least in part reflect lower opportunity for live donation from communities with higher likelihood of contraindications to live donation, notably diabetes.

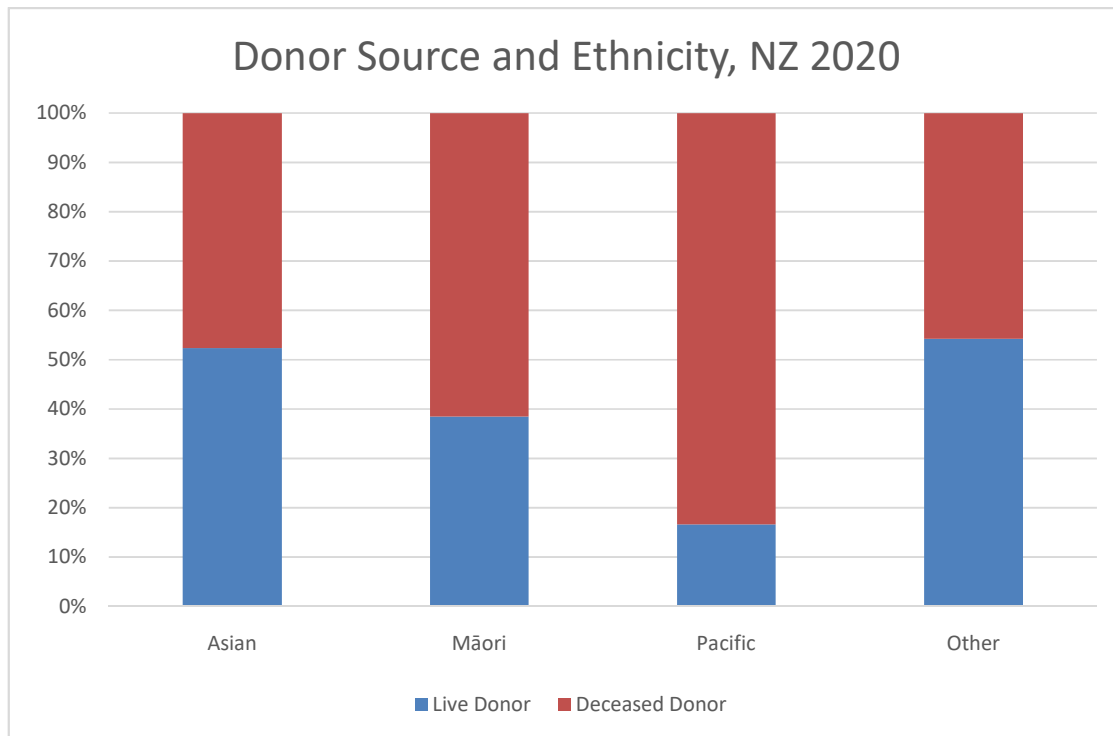


Figure 5: Percentage of Kidney Transplants by Donor Source (Live and Deceased) by Ethnicity, New Zealand 2020

Transplants per 100 End Stage Kidney Disease Patients by Dialysis DHB and Kidney Transplant Region

It should be noted that no attempt is made to adjust for case-mix at different DHBs, so comparisons *between* regions or units may be confounded. Also, due to small numbers at individual units, random variability may be responsible for year to year changes in transplantation rate *within* regions or units, particularly smaller units.

Data are presented by transplant region, although each year several transplants occur out of region for clinical or organisational reasons.

Table 4: Transplants per 100 iESKD Patients by Transplant Region, DHB of Domicile and Donor Type

	Deceased Donor	Living Donor	Total	iESKD	Transplants per 100 iESKD Patients	
					All	Living Donor
Starship	4	3	7	7	100	57
Auckland Region DHBs	73	45	118	480	25	9
Northland	7	1	8	37	22	3
Waitemata	13	9	22	60	37	15
Auckland	10	13	23	60	38	22
Counties Manukau	15	12	27	150	18	8
Waikato (includes BOP, Lakes, Tairāwhiti)	23	6	29	151	19	4
Taranaki	1	1	2	15	13	7
Wellington Region DHBs	16	22	38	113	34	19
Hawke's Bay	2	3	5	17	29	18
MidCentral (includes Whanganui)	4	3	7	32	22	9
Capital & Coast (includes Wairarapa, Hutt, Nelson/Marlborough)	10	16	26	64	41	25
Christchurch Region DHBs	11	20	31	63	49	32
Canterbury (includes West Coast, South Canterbury)	9	14	23	43	53	33
Southern	2	6	8	20	40	30
Total	100	87	187	656	29	13

Notes on table 4:

1. DHB of domicile is the recipients', at discharge from hospital. Living donors may come from different DHBs to their recipients.
2. Transplants per 100 incident end stage kidney disease (iESKD) patients in the 12 months to 31 December 2018, per ANZDATA.

3. Paediatric patients ≤ 16 years, managed via Starship and transplanted in Auckland, are reported separately and are included in Auckland Renal Transplant Group's figures.

Transplant centre and individual dialysing DHBs transplant rate per 100 incident end stage kidney disease patients over the period 2012-2019 are presented in Appendix 2.

Multi-organ Transplantation (all performed in Auckland)

In 2020, there were two simultaneous pancreas-kidney transplants performed (DHB of Domicile: both Canterbury). There were three dual transplants (two kidneys used for one recipient, typically related to donor factors). These are included in table 2.

ABO Incompatible Kidney Transplants (ABOi)

ABOi are now performed at each centre, with Wellington performing their first ABOi in 2019. All centres use a similar protocol, developed in Auckland. All ABOi are living donor transplants. ABOi is an important programme that enables additional directed donations where there is no option for an ABO compatible donor, including kidney exchange.

There were 7 ABOi in 2020 (4 in Auckland, 2 in Christchurch and 1 in Wellington). This was a substantial reduction on the numbers from the year prior, which may be due to more exchanges obviating the need for ABOi kidney transplantation. Encouragingly, ten of eleven referring DHBs have accessed ABOi transplantation in the last two years.

Kidney Exchange

In October 2019, cooperation commenced between the Australian Paired Kidney Exchange and the New Zealand Kidney Exchange, now known as the Australian and New Zealand Paired Kidney Exchange (ANZKX).

Where a willing, acceptable kidney donor is incompatible with their recipient, the pair are encouraged to enter the Australian and New Zealand Kidney Exchange. This facilitates additional live donor transplants by providing exchanges between compatible pairs within the exchange. Occasionally, it may be clinically appropriate to undertake exchange transplantation involving compatible pairs. Exchange transplants may take place within or between transplant centres, including centres in Australia.

Since the COVID-19 outbreak, trans-Tasman exchanges ceased, but individual country exchanges have been proceeding.

In 2020, there were 24 individuals in New Zealand who received kidneys via the exchange programme, including patients from Auckland (4), Canterbury (3), Capital and Coast (6), Counties Manukau (3), Hawke's Bay (2), Starship (1), Waikato (2) and Waitemata (3) referring centres.

Non-Directed Living Kidney Donors

New Zealand has a high rate of non-directed living kidney donation (live donors who donate anonymously to a recipient on the deceased donor waiting list at the centre where they have their

kidney removed). In 2020 there were 14 non-directed live kidney donors (3 in Auckland, 5 in Christchurch and 6 in Wellington). Where the live donor agrees and is suitable, units are encouraged to offer non-directed donors to the ANZKX programme to generate exchange chains, with the final kidney being allocated the deceased donor waiting list, restricted to the unit in NZ which removes the non-directed donor's kidney. In 2020, seven non-directed donors were involved in kidney exchange chains in NZ.

Acknowledgements

NRTS would like to gratefully acknowledge the broad contribution complex health system that provides kidney transplant services in New Zealand, including nurses and nurse coordinators, doctors, allied health staff, managerial staff across a range of clinical services including but not limited to Nephrology, Intensive Care and diagnostic services at all District Health Boards.

We also gratefully acknowledge the work and contributions of Organ Donation New Zealand, the National Renal Transplant Leadership Team, the Australian and New Zealand Paired Kidney Exchange (ANZKX), the Ministry of Health, ANZDATA and the New Zealand Blood and Organ Service.

We also would like to most gratefully acknowledge the organ donors and their families, without whom there would be no transplantation.

Appendix1: Transplantation Service Arrangement in New Zealand

Within New Zealand there are three types of district health boards (DHBs), with respect to provision of transplantation services:

- 1) Transplanting DHBs – these DHBs provide kidney transplantation services for their local population and several other DHBs. These DHBs also have comprehensive dialysis services. There are three of these.
- 2) Referring DHBs with “comprehensive” dialysis services. These DHBs provide their own dialysis services without any involvement from other DHBs. There are eight of these.
- 3) Referring DHBs without comprehensive dialysis services. These DHBs are dependent on referring or transplanting DHBs for at least part of their dialysis service. There are nine of these.

Please note that “comprehensive” is an arbitrary distinction. For example, Nelson/Marlborough provides many dialysis services, with support from Wellington for some elements only, but is included in Capital and Coast DHB’s figures.

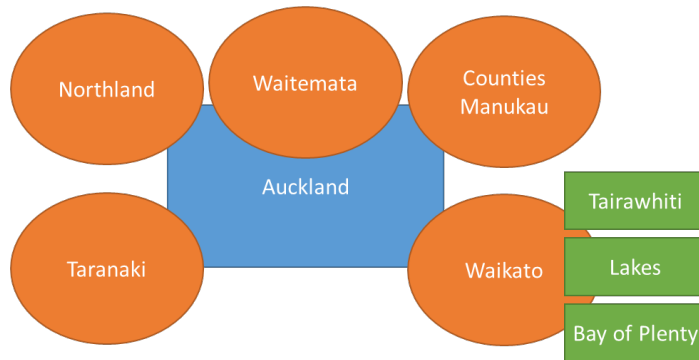
Three district health boards (Auckland, Capital and Coast and Canterbury) provide kidney transplantation procedures (living and deceased donor transplants) regionally (labelled “Auckland Renal Transplant Group”, “Wellington Renal Transplant Service” and “South Island Kidney Transplant Committee”). Assessment of recipients and potential living donors is complex and is, at least partially, provided by referring DHBs in most cases. Referring DHBs send patients to a single transplant centre for routine transplants. Auckland DHB provides multi-organ transplants (kidney plus another organ) and paediatric transplantation for the entire country.

The arrangements of DHBs into three regional transplantation services are shown in Figure 1. Some patients are, therefore, dependent on services provided via three DHBs for access to transplantation.

Transplanting DHBs provide the immediate after care following transplantation, with recipients and donors returning to their DHB of domicile for long term care.

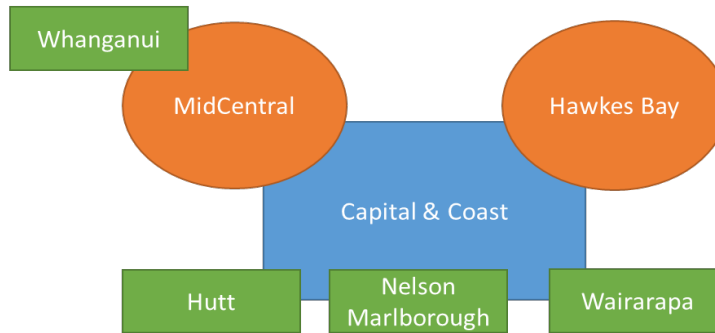
Arrangement of DHBs for Provision of Kidney Transplantation Services

Auckland Renal Transplant Group

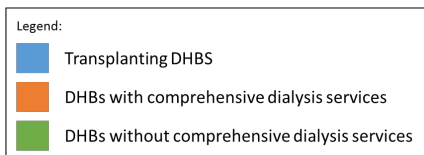
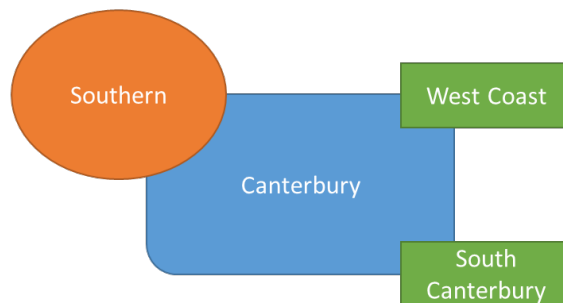


Auckland provide national kidney transplantation services for all other DHBs: Kidney-Pancreas, ABO incompatible (except Canterbury) and paediatric transplantation

Wellington Renal Transplant Service



South Island Kidney Transplant Committee



Appendix 2: Transplants per 100 Incident End Stage Kidney Disease Patients by Dialysing DHB and Kidney Transplant Region (2012-2019)

It should be noted that no attempt is made to adjust for case-mix at different DHBs, so comparisons *between* regions or units may be confounded. Also, due to small numbers at individual units, random variability may be responsible for year to year changes in transplantation rate *within* regions or units, particularly smaller units.

Attribution of transplants to regions

Attribution to region is by referring dialysis DHB of the recipient at the point of discharge from transplantation event, but very occasionally at the point of referral for transplantation where patients change DHB on discharge.

DHBs are grouped by their local transplant service. Small numbers of transplants may have occurred at another transplant centre but will be grouped with the local centre. For example, a transplant undertaken in Wellington for a patient from Southern DHB will appear in the South Island Transplant Region figures.

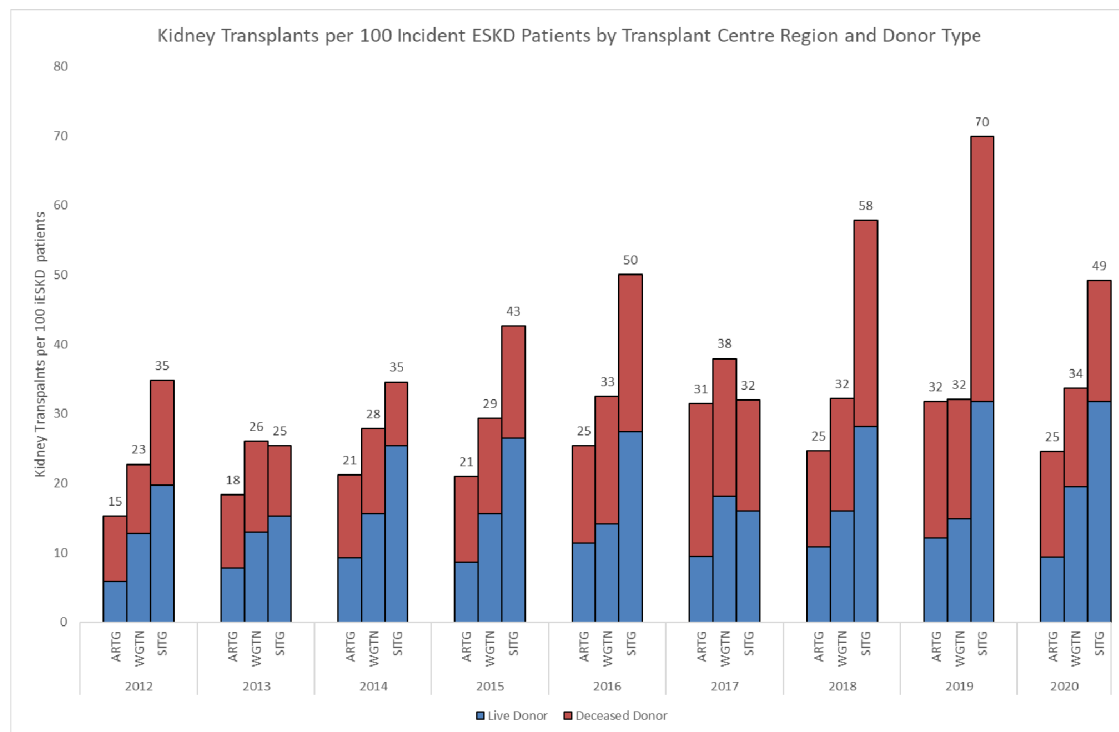


Figure 6: Kidney Transplants per 100 Incident End Stage Kidney Disease Patients by Centre and Donor Type, 2012-2020, New Zealand

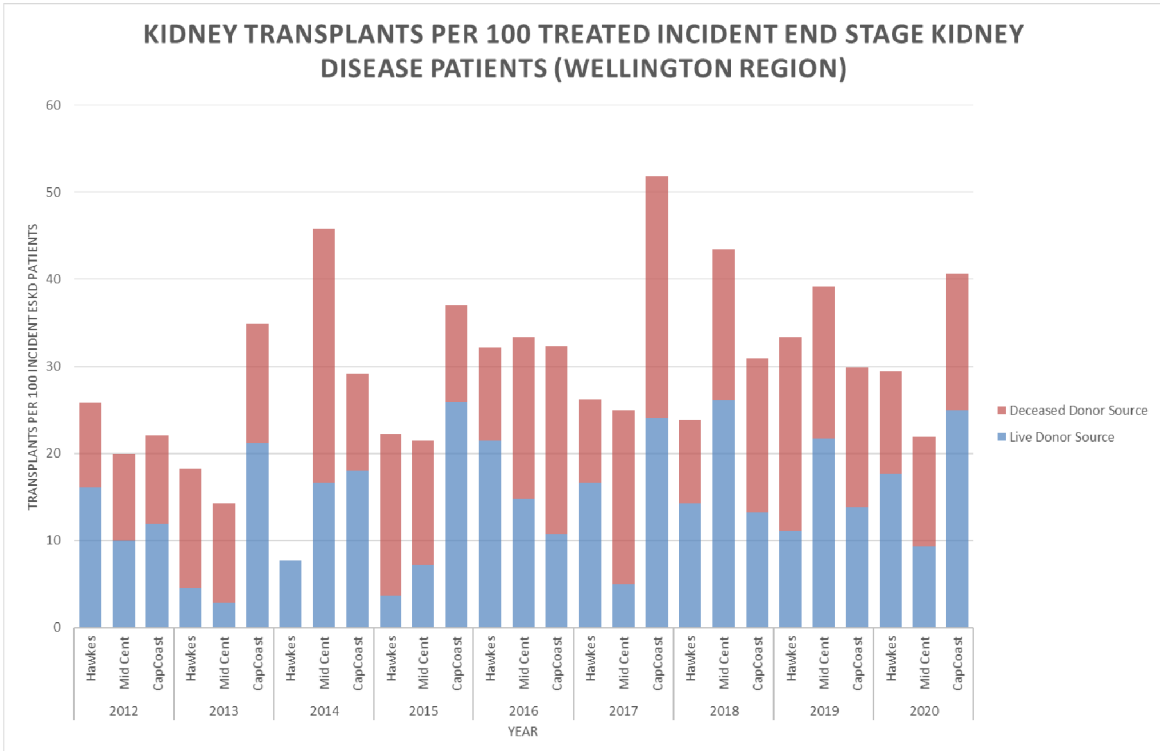


Figure 7: Kidney Transplants per 100 Treated Incident End Stage Kidney Disease Patients, Wellington Transplant Region 2012-2020

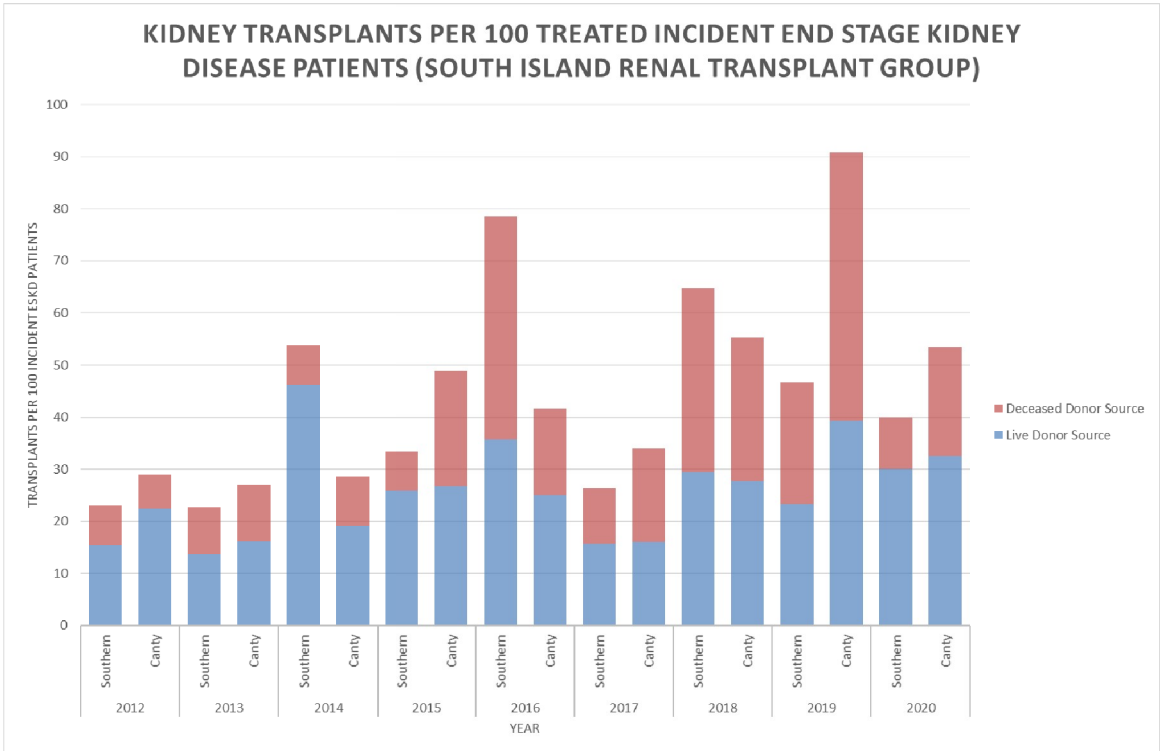


Figure 8: Kidney Transplants per 100 Treated Incident End Stage Kidney Disease, South Island Transplant Group Region 2012-2020

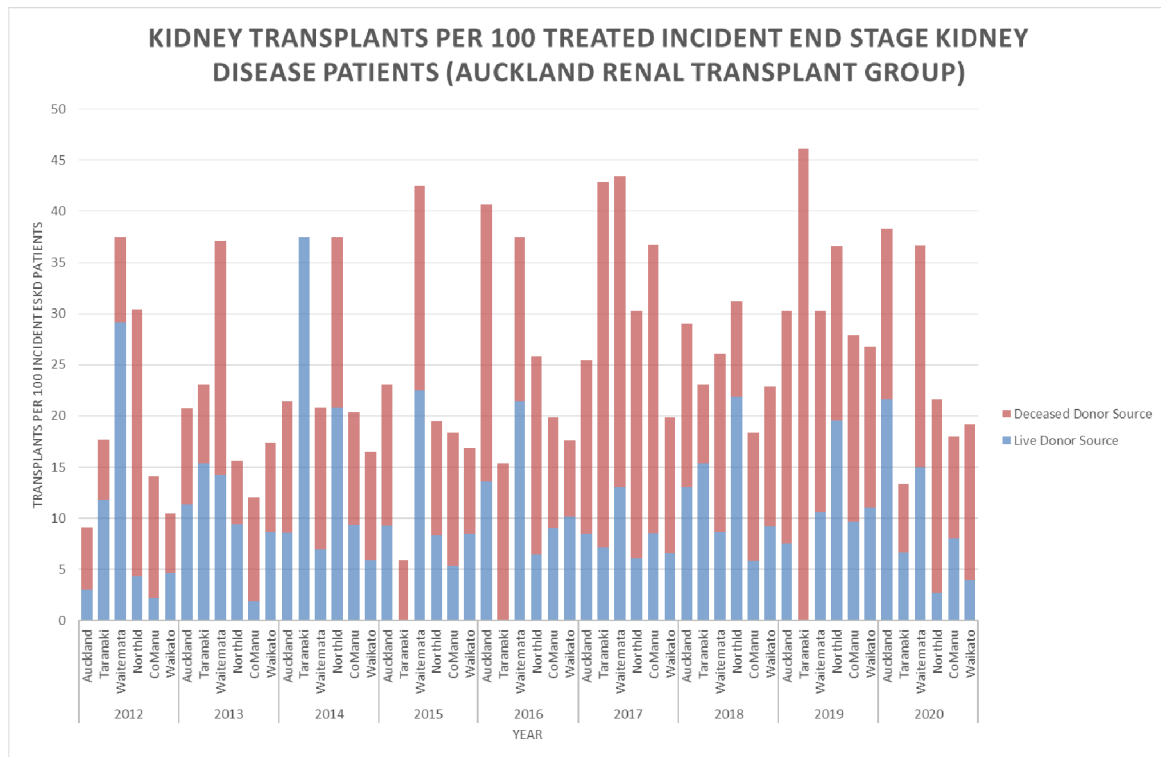


Figure 9: Kidney Transplants per 100 Treated Incident End Stage Kidney Disease, Auckland Regional Transplant Group 2012-2020