National Kidney Transplant Service

Annual Report
2019

"Aine is now living life as she always should have been, happy, healthy and dialysis free. Donating to Aine was the greatest decision I ever made."

Grace and Áine O'Donoghue Kidney transplant donor and receipient

Grace O'Donoghue
Kidney Donor

I donated a kidney to my sister Aine O'Donoghue on the 30th of September 2019. Prior to donation, Aine spent three days per week in Tallaght hospital on dialysis. She was then on dialysis for over three years. Aine was diagnosed with anti-GBM disease and after numerous surgeries and several chemotherapy sessions, she was finally well enough to be entered into the pool for a transplant. After watching Aine be so unwell for so many years, I wanted to save my sister, this was something I felt I had to do and I was not going to give up. I was a 100% match for Aine, and after a long battle and numerous tests, it was decided on the 14th of August 2019 that i could donate to Aine. Four months on, and Aine is now living life as she always should have been, happy, healthy and dialysis free. Donating to Aine was the greatest decision I ever made. And I will never look back and regret the decision. I would do it again tomorrow.

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Acknowledgements

We are indebted to the renal centres around Ireland for continuing to provide long term follow up data to the Renal Transplant Registry in order to produce this report. In particular, we wish to acknowledge the continued support from the Clinical Nurse Specialists in the regional centres in providing us with timely data, without which this report could not be produced.

Editorial Team

Conall O'Seaghdha, Dilly Little, Patrick O'Kelly and Yvonne Williams.

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Foreword

For patients with end stage renal disease (ESRD), successful renal transplantation provides a significant survival benefit – doubling the life expectancy, as well as restoring quality of life and providing significant health benefits for the individual recipient. Over 2500 patients transplanted by the National Kidney Transplant Service (NKTS) now enjoy the benefits of a functioning transplant and with our excellent outcomes, this number continues to grow annually. Patients receiving a kidney from a living kidney donor are especially predicted to reap the benefits of planned kidney transplantation, which is why we encourage patients entering the transplant waiting list to explore this option with friends and family. This National Kidney Transplant Service Annual Report for 2019 details the trends of the renal transplant waiting list, data regarding the kidney transplants performed over the year are reviewed and the outcomes of patients who have been transplanted are presented.

Each kidney transplant performed, is only possible due to the extraordinary generosity of the deceased donor family who can reach out to a person in need, in the midst of their time of loss or to the bravery of a living kidney donor who literally give of themselves so that the recipient's life is restored. The entire transplant team at the NKTS recognise the incredible generosity of all kidney donors who present the gift of life and health to each recipient successfully transplanted.

Ms Dilly Little
Surgical Director, NKTS

Prof Conall O'Seaghdha
Medical Director, NKTS

Our mission is fair and equitable access to transplantation for all suitable patients, a commitment to quality through continuous improvement of our standards, processes, and outcomes, and a lifelong duty of care to both kidney donor and recipient.

Highlights 2019

462

462 on the waiting list in 2019 down from 483 in 2018

18

The average waiting time to transplant in 2019 was 18 months

9

Average waiting times for living donor transplants were shorter at 9 months in 2019

40

8 recipients reached their 40th anniversary in 2019 bringing to a total of 15 with functioning allografts > 40 yrs

46

46 very highly sensitised patients (PGen > 84%) were transplanted in 2019

2,577

2577 recipients with functioning transplants at the end of 2019

↘

Increased transplant activity has resulted in a 4.3% fall in the numbers on the waiting list

>

Kidney transplant survival is significantly better in the Republic of Ireland when compared with European outcomes collected by the European Collaborative Transplant Study (CTS)

↗

The probabilities of transplant survival and patient survival have steadily improved among recipients of both living and decreased donor kidney transplants over the past 20 years

SECTION 1

Overview

Kidney transplantation is the best treatment for patients with kidney failure. Kidney transplant patients have better survival, overall health, and quality of life when compared to patients remaining on dialysis. This National Kidney Transplant Service (NKTS) annual report for 2019 details the trends of the kidney transplant waiting list, kidney transplants performed over the years, and the health outcomes of those who have received a transplant.

We performed 153 kidney transplants at the National Kidney Transplant Service in 2019, consistent with a stable level of total transplant activity for the past 10 years. However, although the overall level of activity is similar, the profile of kidney transplantation in Ireland has changed significantly in that time. For example, 30% of transplants in 2019 were for previously untransplantable 'highly sensitised' recipients, thanks to an initiative begun in 2016, discussed below. Furthermore, an increasing number of transplants were following donations after cardiac death, a more complex and resource intensive donor group that has the potential to expand the deceased donor pool. Finally, over 15% of transplants were from living donors, a program that only formally began in 2009.

The number of patients alive with a functioning transplant continues to grow, primarily as a result of improved survival in transplant patients. This number reached 2,577 at the end of 2019, a 2.7% increase from the previous year. There was also a 4.3% fall in the numbers on the waiting list, from 483 in 2018 to 462 in 2019. Nonetheless, the active waiting list at the end of 2019 remains two and half times larger than the supply of donor kidneys, with a shortage of suitable organs for transplant remains a perennial challenge. The median waiting time to transplant was 18 months, a slight improvement from 2018.

Irish kidney transplant outcomes continue to be excellent. The median survival (life expectancy) of allografts for deceased donor kidney transplants in the National Kidney Transplant Service is 14.3 years, and we have witnessed steady improvements in this figure since the 1980s. Based on most recent data, the 1-year allograft survival for deceased donors is 97.5% and patient survival is over 99%. We bench-mark our outcome data against the European Collaborative Transplant Study and our outcomes exceed the CTS mean for all outcomes. This year, 8 recipients reached the 40th anniversary of their transplant, bringing to 15 the number of patients with a kidney transplant lasting over 40yrs.

We performed 25 living donor kidney transplants in 2019. While outcomes for living donors are similar to that for deceased donor transplants in the first year (95% and 100% transplant and patient survival respectively), the benefits living donor transplant become apparent in subsequent years. At the 5 year time point, living donors kidneys had a 91% graft survival and 97% patient survival probability compared to 86% deceased donor kidney transplant survival and 90% patient survival. In addition, patients who received a living kidney donor spent considerably less time waiting for a transplant and spent less time on dialysis, with a significant number avoiding the need for dialysis entirely. These outcomes highlight the enormous advantages of living kidney donation and illustrate why living donation should be the first choice for the majority of Irish patients. It is for these reasons that our motto is 'Living Donor First'.

Despite these clear advantages, uptake of living donor transplantation in the Republic of Ireland is low. We performed fewer living donor transplants in 2019 than in 2018, and were below our target of 50 living donor transplants for the year. This was despite evaluating our highest ever number of potential kidney donors, 12% more than in 2018. Unfortunately the majority of those coming forward were medically unsuitable to proceed.

For those that are medically fit to proceed to donation, outcomes continue to be excellent. Complication rates are low, with new onset high blood pressure being the commonest finding, occurring in approximately 10% of younger donors and 20% of older donors. Kidney function post donation tends to improve over time, and the average donor maintains 66% of their pre-donation level of kidney function 5 years later. In Ireland, the median age of a living donor is 44 years and they tend to be a sibling, spouse or parent of the recipient. There have been no deaths related to donation or cases of kidney failure in donors since the NKTS living donor program formally began in 2009.

Regrettably, despite excellent outcomes for both donor and recipient, most patients have no potential donors come forward. As such, there is a pressing need to specifically promote living donor transplantation as the treatment of choice for kidney failure and to encourage potential donors to come forward. We have been actively engaging with the Department of Health in 2019 with a view to a targeted public awareness campaign on this issue. We are encouraged by signs of an early increase in living donor activity for 2020.

The continued expansion of the 'highly sensitized' program was our greatest success at NKTS in 2019. This program aims to find suitable kidney transplants for otherwise untransplantable patients due to the presence of antibodies in their bloodstream. A total of 46 such highly sensitized patients were transplanted in 2019, almost a third of all activity, with one of whom having been on dialysis for over 19 years. The success of this program is due to the hard work and dedication of the entire transplant team, but particularly the staff at the H+I laboratory at Beaumont Hospital led by Dr. Mary Keogan.

We are continuously humbled by the generosity shown by all kidney donors and their families. Every deceased donor kidney transplant comes at a time of utmost tragedy for families, who look beyond their own loss and grief to save the life of another person. Living donors place themselves in harm's way to help a loved one, often without a second thought. As such, we have witnessed the best of human nature through working in this program and wish to thank all donors and their families for their generosity.

SECTION 2

Kidney Transplant Activity 2019

- **In 2019, 153 kidney transplants were performed in the Republic of Ireland (ROI). Of these, 25 were from living donors, 128 were from deceased donor kidneys.**
- **Despite the fluctuating number of kidney transplants performed in recent years the number of recipients living with a functioning transplant continues to grow steadily, with cumulative numbers reaching 2,577 at the end of 2019, a 2.7% increase over 2018 (2,510). Of the 2,577 functioning kidney transplants in our service, 2,501 (97%) were transplanted in Beaumont Hospital.**
- **There were 25 living donor kidneys transplanted in 2019. This represents 16% of all kidney transplants performed per annum. The number of deceased donor kidney transplants was 128 for 2019 which includes 2 simultaneous pancreas/ kidney (SPK) transplants.**
- **There were 5 paediatric (<18yrs) transplants that took place in Temple St Children's University Hospital. The majority of these (4) were from a living Donor, usually from one of the parents.**
- **Four patients received transplants from the Paired Kidney Exchange programme, in collaboration with our colleagues in the UK. Ten potential donors are currently active in this programme which offers an alternative for highly sensitized patients to receive a transplant.**

2.1 Summary of kidney transplant activity 2014-2019

Table 2.1: Summary of transplant activity 2014 – 2019

Category	2014	2015	2016	2017	2018	2019	Average for 6 yrs. (rounded)
Total number of transplanted kidneys*	152	153	172	192	167	153	165
Number of deceased-donor kidney only transplants	107	120	122	136	122	126	122
Number of Living donor kidney transplants	40	33	50	51	40	25	40
Number of Simultaneous Pancreas/Kidney (SPK)	5	0	0	5	5	2	3
Number of Paired Kidney Exchange (Living donor UK)	5	8	7	3	3	4	5

*includes SPK and excludes paired kidney exchange (UK)

Table 2.2: Functioning transplant at the end of 2019

Category	0-10 years	>10-20 years	>20-30 years	>30-40 years	>40 years	Total kidneys
Deceased donor kidney only transplants	1,071	679	245	43	6	2,044
Living donor kidney transplants	315	32	2	29	9	387
Simultaneous Pancreas/Kidney (SPK)	34	30	4	0	0	68
Kidney/Liver	0	1	1	0	0	2
All kidney transplants*	1420	742	252	72	15	2,501

*excludes functioning transplants from recipients of kidneys transplanted abroad who are part of the national kidney transplant service

Figure 2.1: Number of deceased donor kidney transplants per annum 1964 – 2019

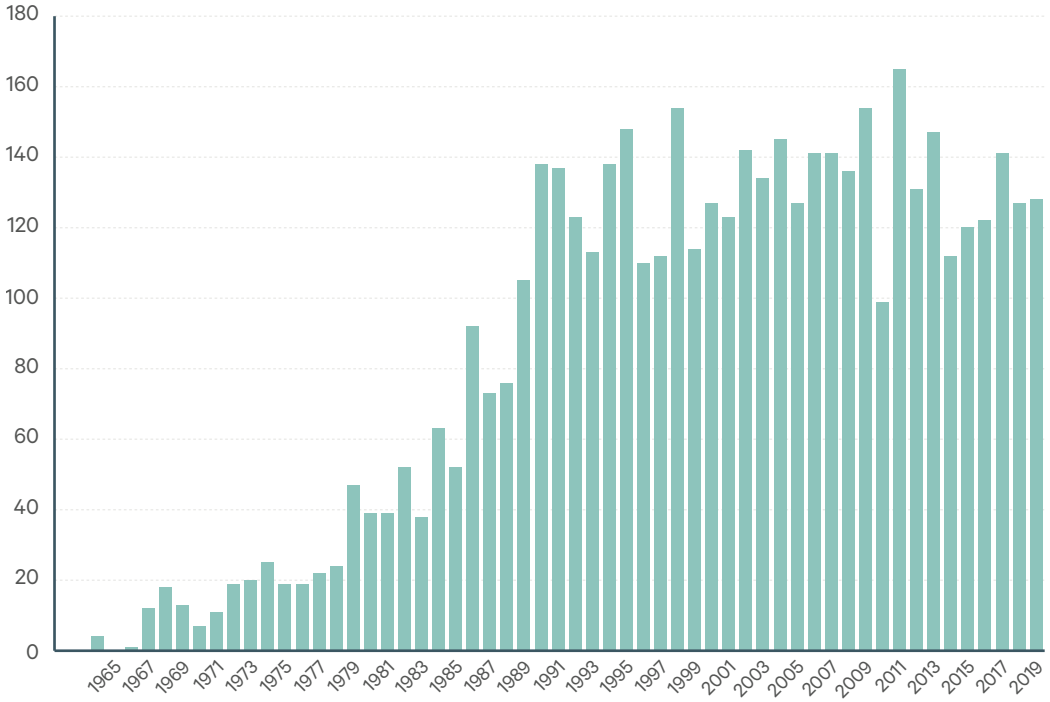


Figure 2.2: Number of living donor kidney transplants per annum 1972 – 2019

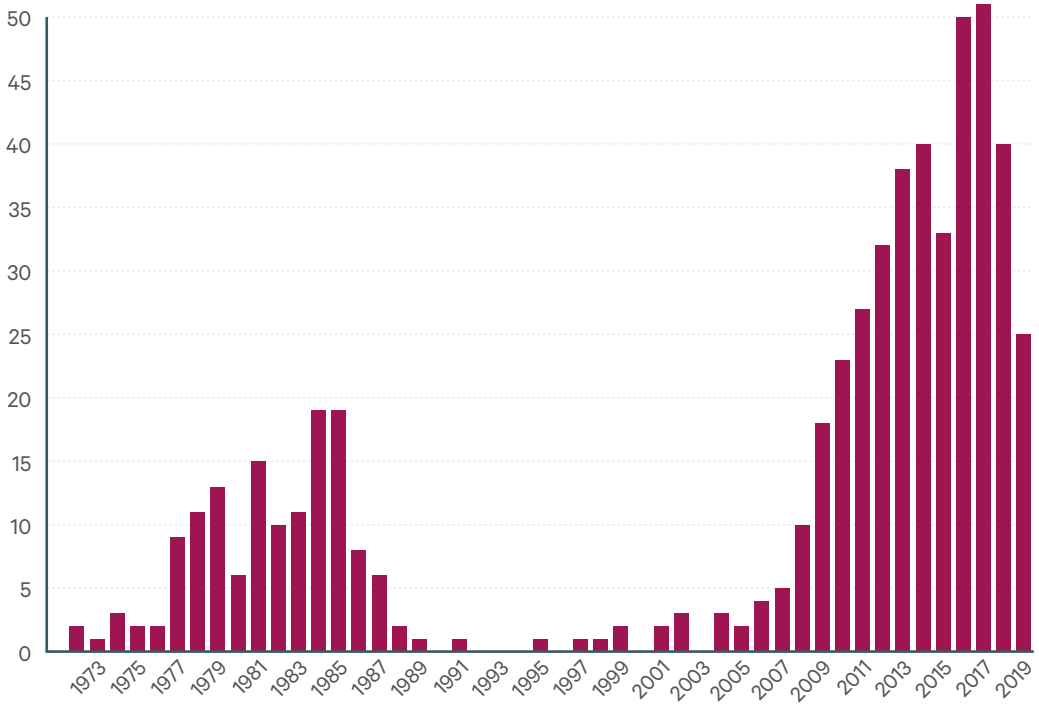


Figure 2.3: Proportion of total deceased & living donor kidney transplants 2002 – 2019

Ireland is one of the best countries in the EU for long term survival of kidney transplants

2.2 Immunosuppression protocol 1983-2019

Figure 2.4: Immunosuppression protocol for deceased and living donors 1983 – 2019

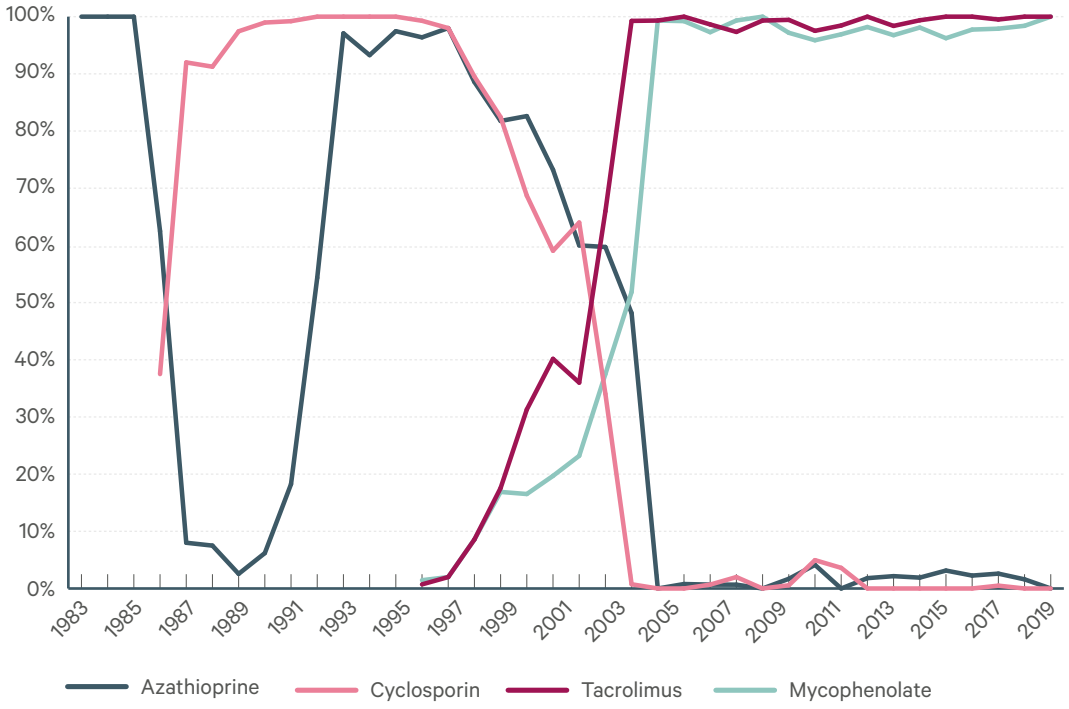
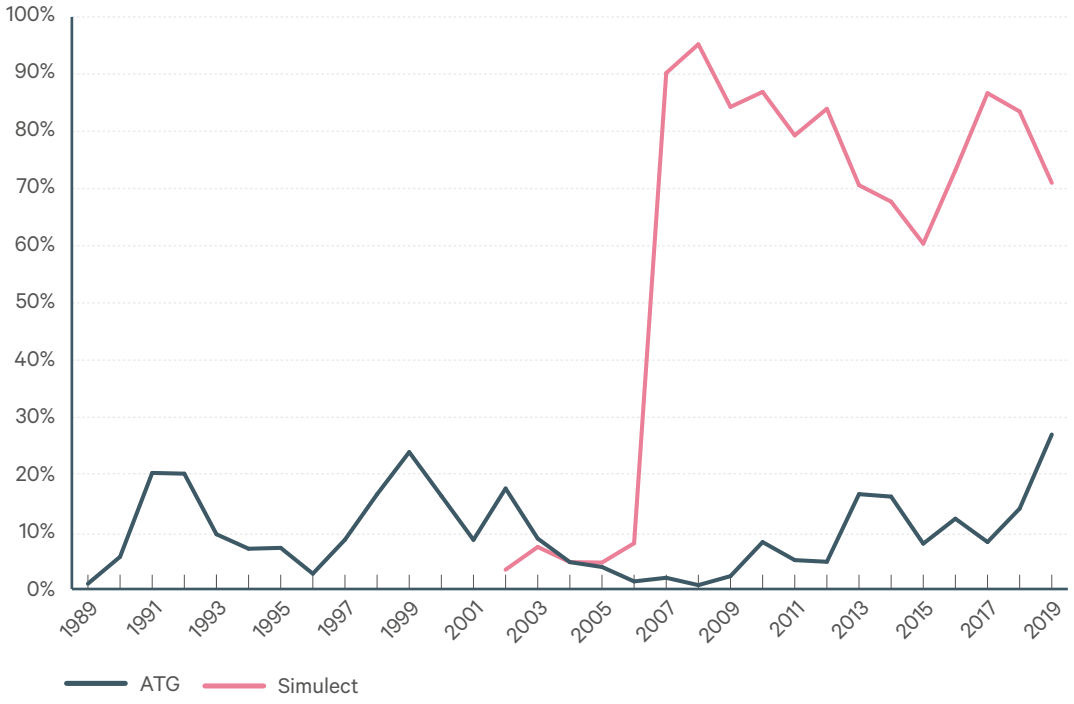


Figure 2.5: Induction therapy for deceased and living donors 1989 – 2019



SECTION 3

Kidney Transplant Waiting List

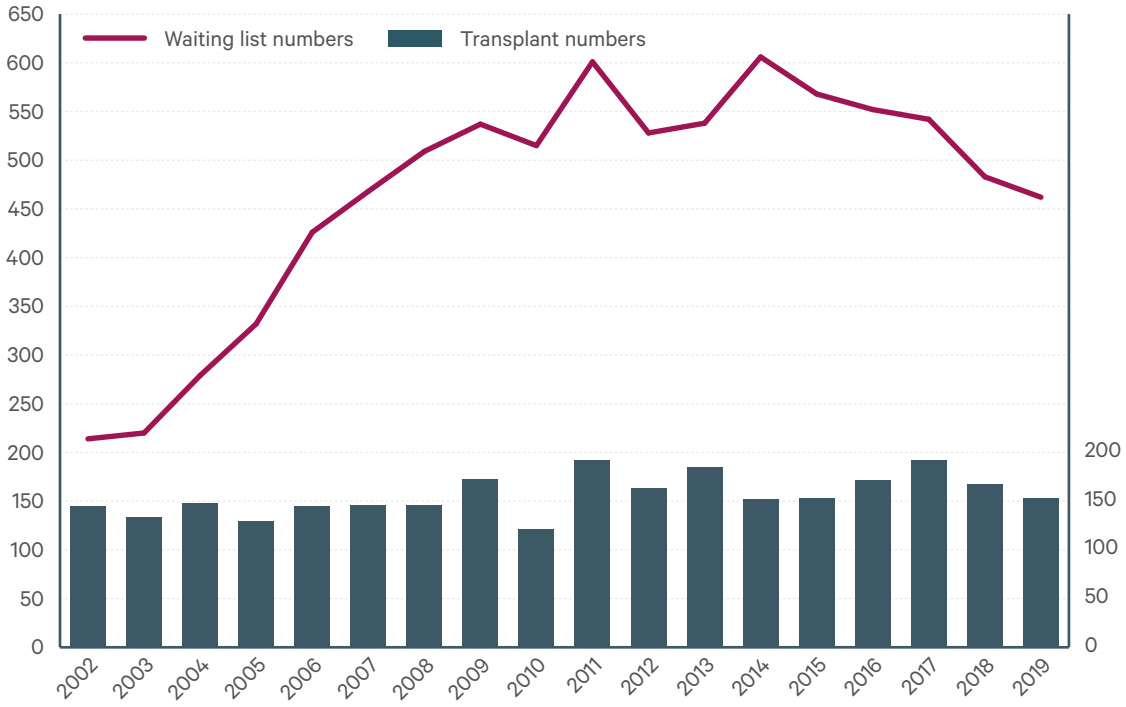
- **At the start of 2019, the kidney transplant waiting list fell significantly over the previous year to 462, a reduction of 20 from the previous year's total of 482. This represents a gradual reversal of the trend from 2002 – 2014 where a high of 606 was recorded in 2014 (Figure 3.1).**

- **The median waiting time to transplant in 2019 was 18 months, i.e. of the 153 patients transplanted last year 50% received a kidney within 18 months of being placed on the pool, similar to the previous year. Waiting times for living donor transplants were shorter than for deceased donor transplants, at 9 months and 20 months respectively (Figure 3.2). The waiting times for deceased and living donors has stabilised or even reduced slightly reflecting the reductions in overall transplant waiting list numbers.**

- **Median times on dialysis have fluctuated somewhat in recent years and showed overall times of 33 months which is similar to 2010-2013 period but is an increase from 2015 where the overall time on dialysis was 26 months. Times on dialysis were 36 months for deceased donor recipients and 22 months for living donor recipients (Figure 3.3). Although dialysis times are strongly correlated with time on the waiting pool, they are not directly linked due to the fact that a certain percentage are pre-emptively transplanted (without commencing dialysis). During 2019, 13 (8.5%) of patients were pre-emptively transplanted.**

3.1 Number on kidney transplant waiting list compared with total number of kidney transplants

Figure 3.1: Number of potential recipients (active and suspended) on transplant waiting list and total kidney transplants 2002-2019



3.2 Median time on transplant waiting list and median time on dialysis prior to transplant

Figure 3.2: Median time on the waiting pool prior to first transplant 2002-2019

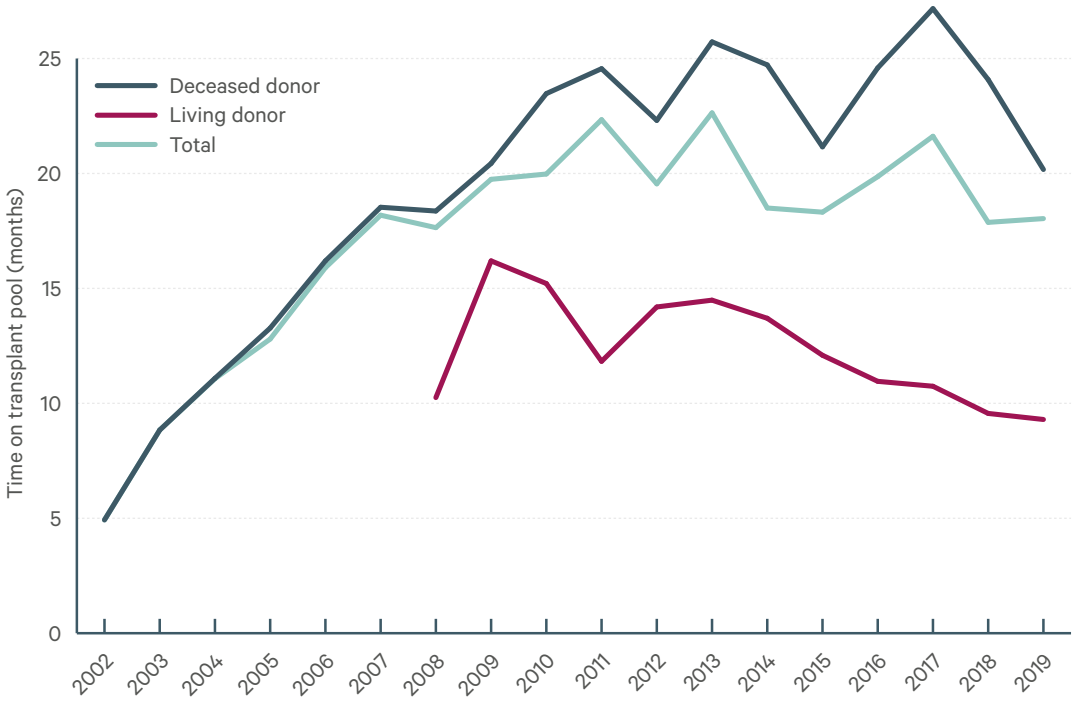


Figure 3.3: Median time on dialysis prior to first transplant 2002-2019

3.3 Referring centre of transplant recipients

- **The percent of transplant recipients by referring centre for the last 6 years are presented in Figure 3.4. As the largest referring centre in the country Beaumont Hospital had the greatest number referred in 2019 at 35 (23%) followed by Cork/Tralee at 22(14%). Alongside the 2019 percentages, overall percentages for the last 6 years are presented to illustrate any deviation from the expected numbers.**

- **Figure 3.5 shows the percent of patients transplanted relative to the number on the transplant waiting pool at the end of the previous year. For example there were 6 patients on the waiting pool at the end of 2018 from the combined centres of Crumlin / Temple Street Childrens hospitals and there were 5 kidneys transplanted from these centres during 2019 representing a rate of 83%.**

Figure 3.4: Percentage of total kidneys transplanted by referring centre for years 2019 separately and overall for years 2014-2019

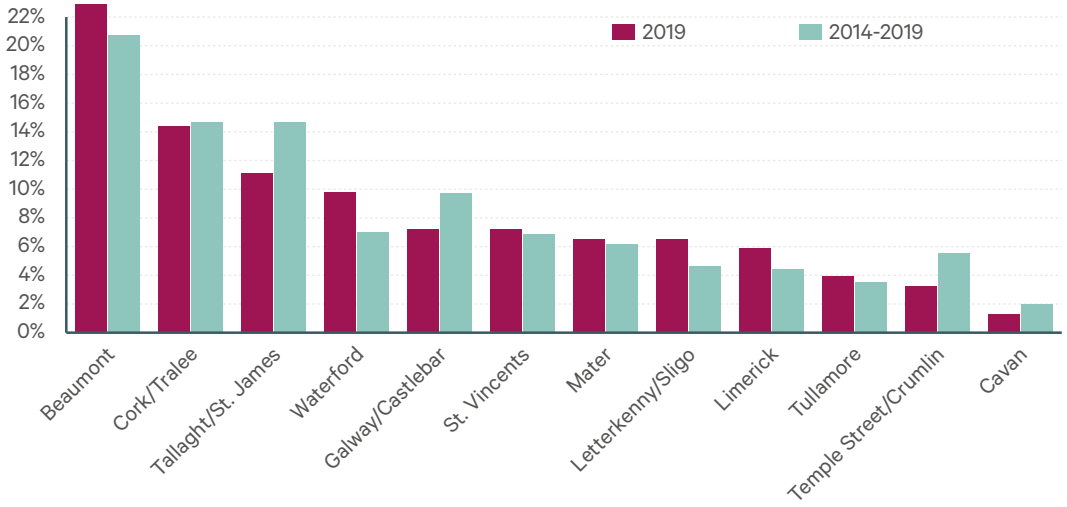
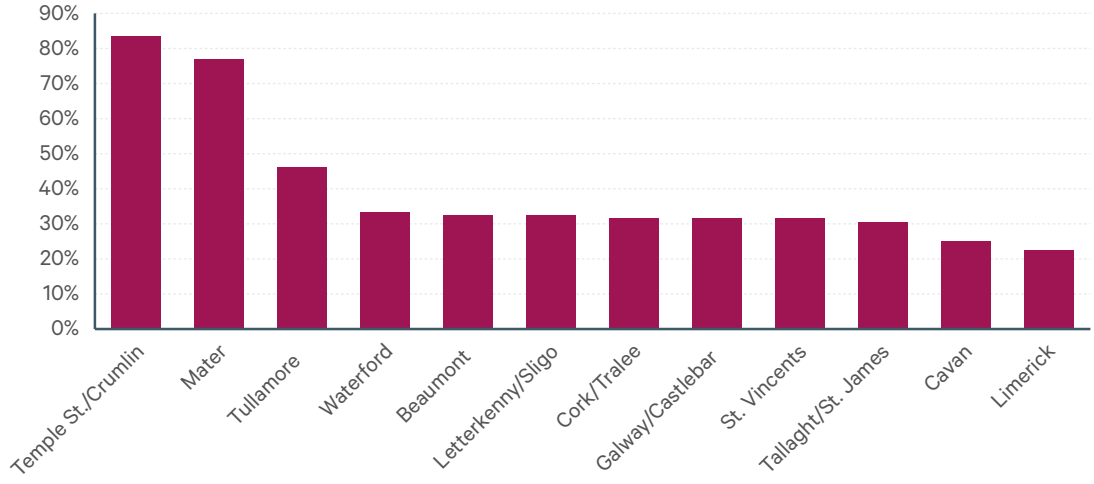


Figure 3.5: Percent of patients transplanted in 2019 relative to number on the kidney transplant waiting pool at the start of 2019 by transplant centre



SECTION 4

Donor and Recipient Characteristics at Transplantation

- **There has been a modest trend of increasing recipient age at time of transplant for deceased donors. The median age increased from 43 years in 2002 to 50 years in 2019 (Figure 4.1). During 2019 the age ranges were from 9 years to late seventies.**

- **During 2019 the median recipient age of living donor transplant was 41 years, close to the overall median age of 40 years for the period 2007 – 2019 (Figure 4.2). For comparison, during a previous period of high living donor transplant activity, 1977 – 1985, the median age at transplant was 28 years.**

- **Recipient sex ratios of deceased and living donor kidneys has remained fairly constant over time, with approximately two thirds of transplants going to male recipients, which reflects the sex distribution on the transplant waiting list. It is noteworthy that 2019 showed a greater percentage of male recipients transplanted (67%) compared to the period as a whole (Figure 4.3).**

- **Renal replacement modalities prior to transplantation show a relatively high percent of patients on regular haemodialysis (65%) compared to overall percentages for the 18 year period (56%). As a result, the percentages of those on peritoneal dialysis and pre-emptive transplants were relatively low during 2019 (Figure 4.4).**

- **The number of people on the transplant waiting list for whom there is difficulty in finding a compatible donor due to the presence of antibodies poses a major challenge. Due to previous transplants, blood transfusion and previous pregnancy, there has been an increase in the numbers of patients on the transplant waiting list who are highly sensitized. There has been a steady increase in the number of such 'highly sensitised' patients transplanted in recent years with nearly a third (31%) of all patients in 2019 with a PRA >= 85% (Figure 4.6).**

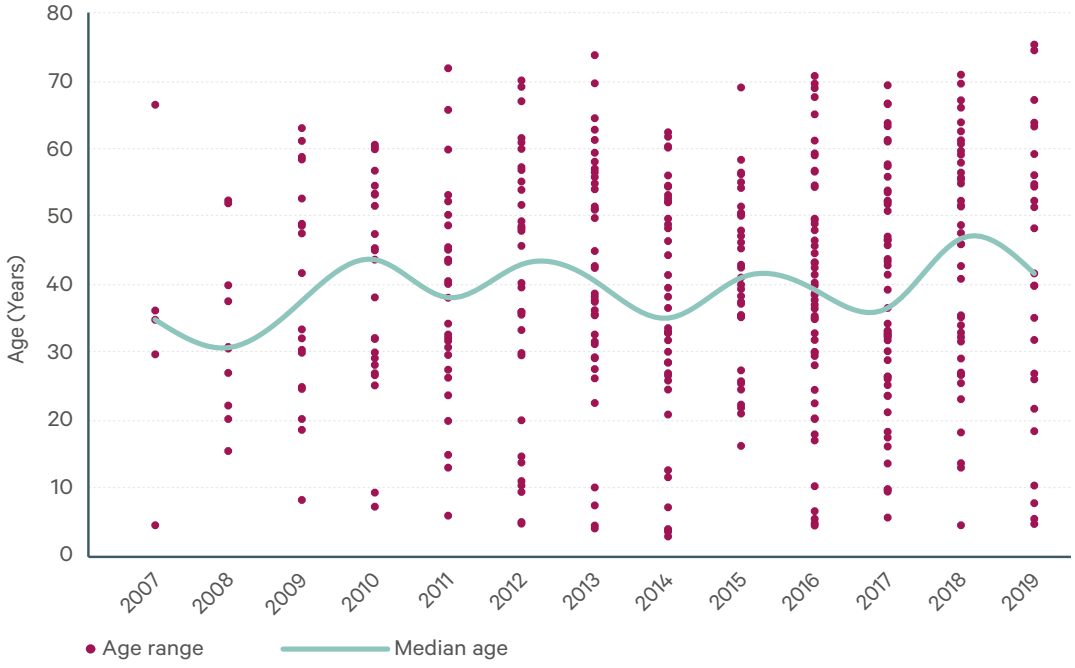
- **Median donor age for deceased donor recipients has increased gradually from 38 in 2002 to 52 in 2019 (Figure 4.7). This represents the highest median donor age for deceased donor kidneys and illustrates the challenges with regards to marginal donors. Median donor age for living donors has remained fairly constant in recent years and was 46 years in 2019 compared to 45 years for the period 2007-2019 (Figure 4.8).**

- **Donor sex ratios show more male donors for deceased donor kidneys and more female donors for living donor kidneys (Figures 4.9 and 4.10).**

4.1 Recipient age

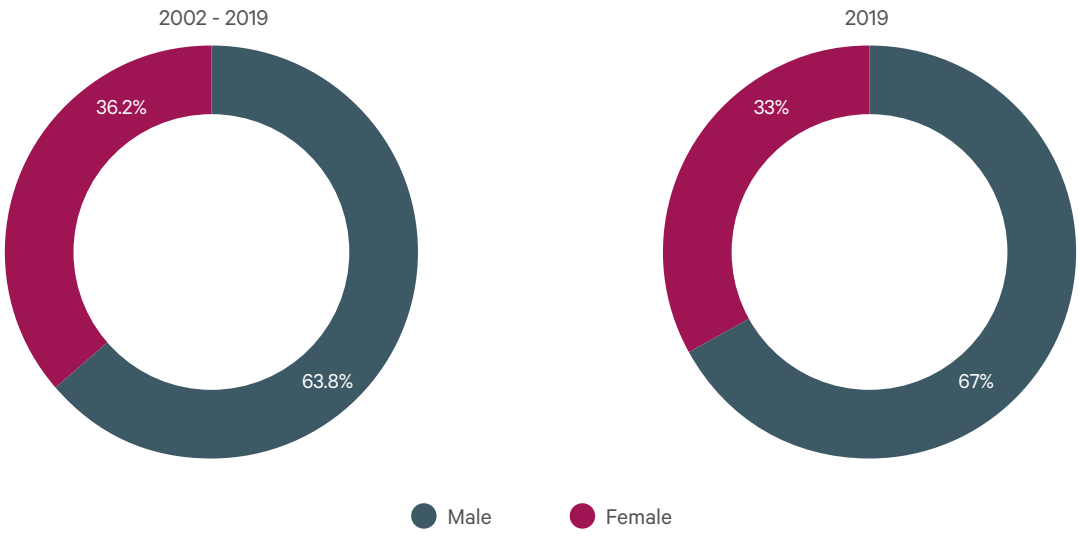
Figure 4.1: Recipient age at transplant for deceased donor kidneys 2002 – 2019

Figure 4.2: Recipient age at transplant for living donor kidneys 2007 – 2019



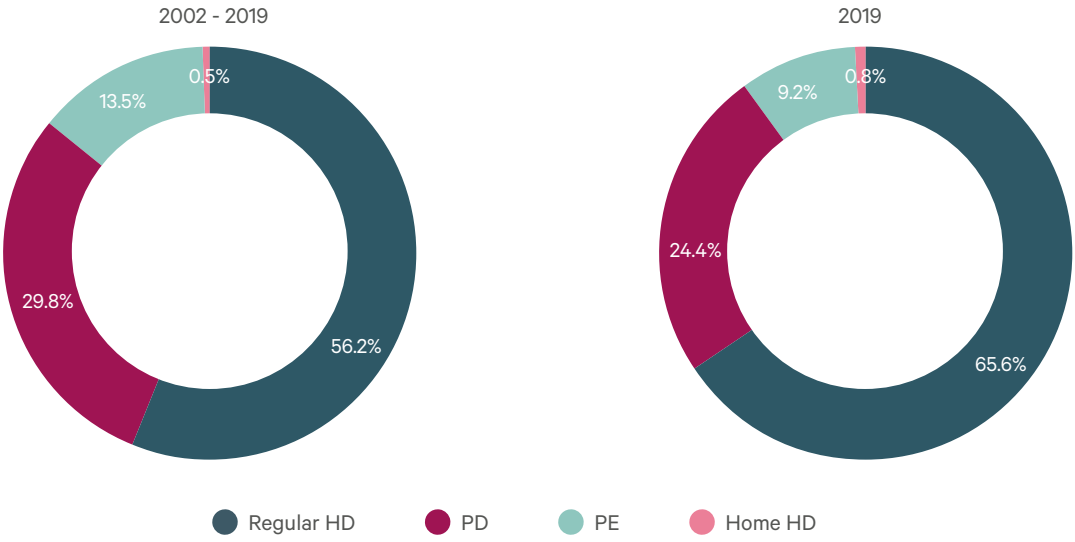
4.2 Recipient sex

Figure 4.3: Sex of recipient for combined deceased and living donor kidney transplants 2002 – 2019



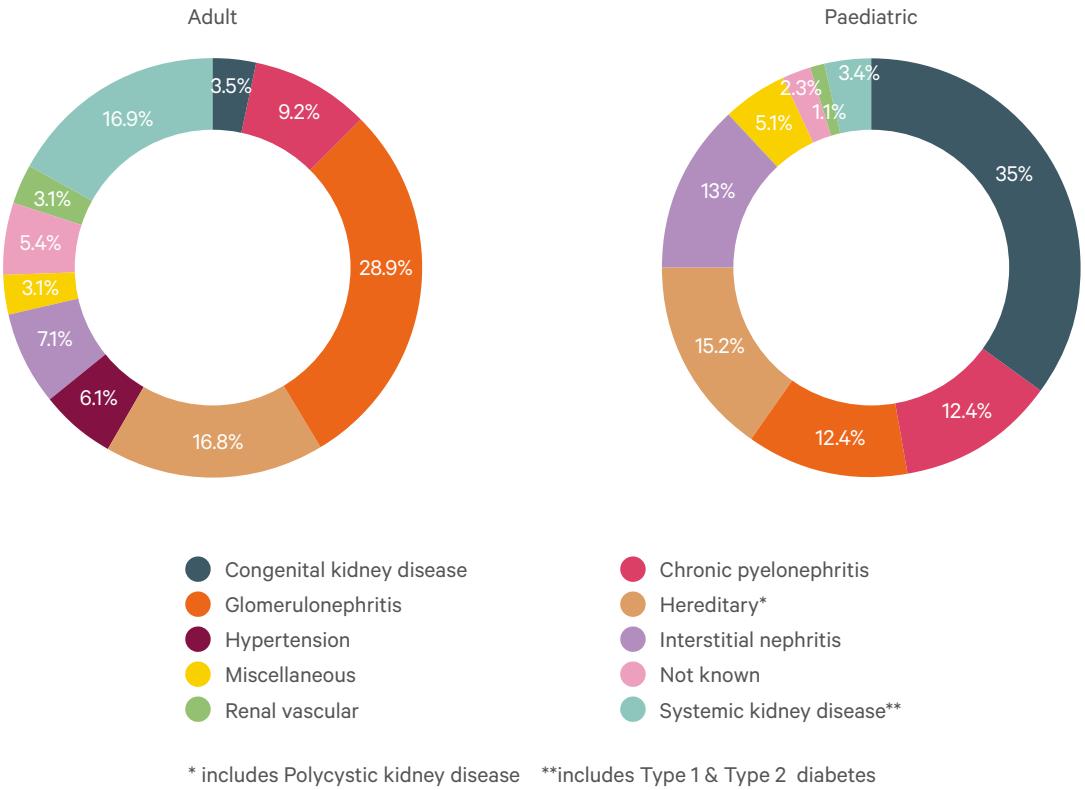
4.3 Mode of renal replacement therapy prior to transplantation

Figure 4.4: Mode of renal replacement prior to first kidney transplant 2002 – 2019



4.4 Cause of end stage renal disease for adult and paediatric recipients

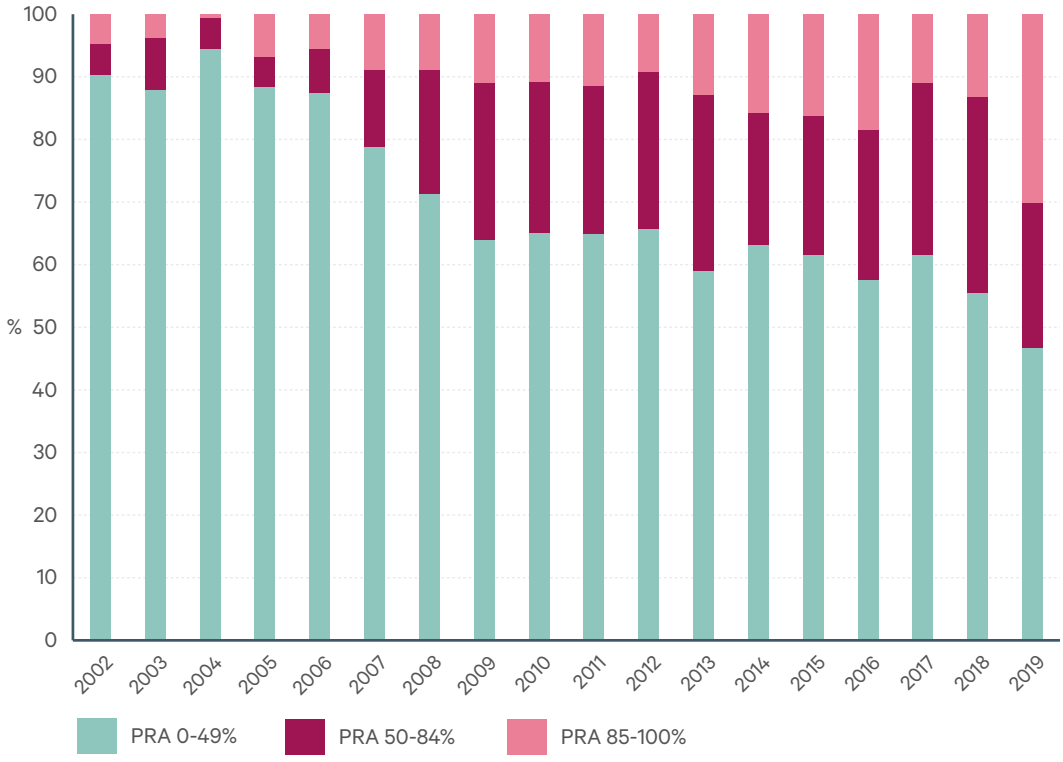
Figure 4.5: Cause of end stage renal disease for adult and paediatric transplant recipients 2002-2019



* includes Polycystic kidney disease **includes Type 1 & Type 2 diabetes

4.5 Panel reactive antibodies of transplant recipients

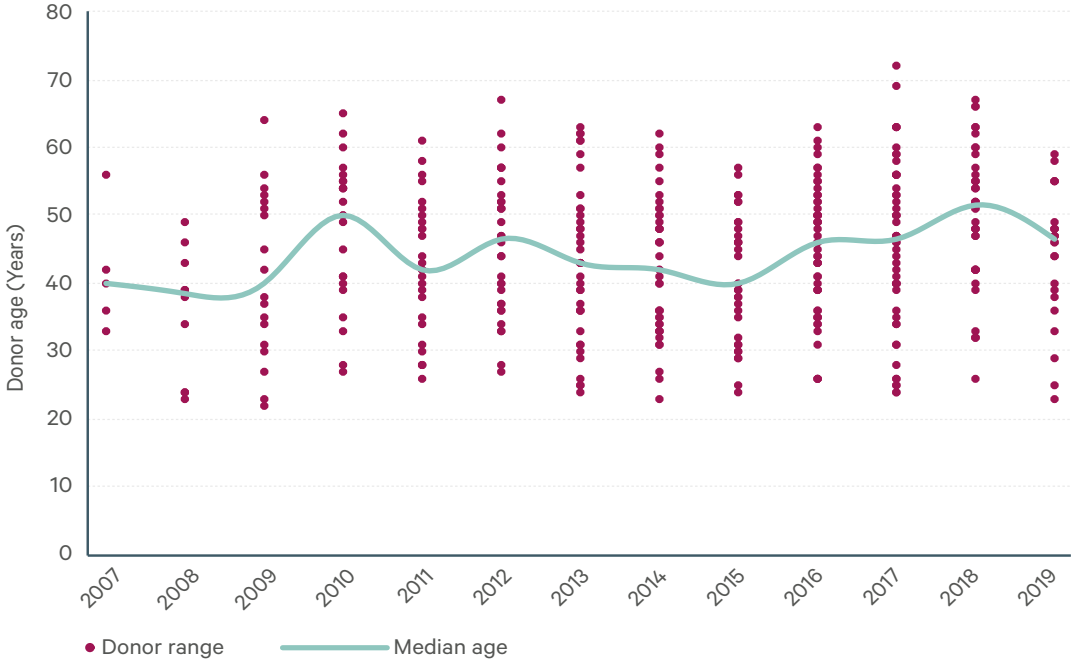
Figure 4.6: Percent PRA in categories 2002- 2019



4.6 Donor age

Figure 4.7: Donor age for deceased donor kidney transplants 2002 – 2019

Figure 4.8: Donor age for living donor kidney transplants 2002 – 2019



4.7 Donor sex

Figure 4.9: Donor sex for deceased donor kidney transplants 2002 – 2019

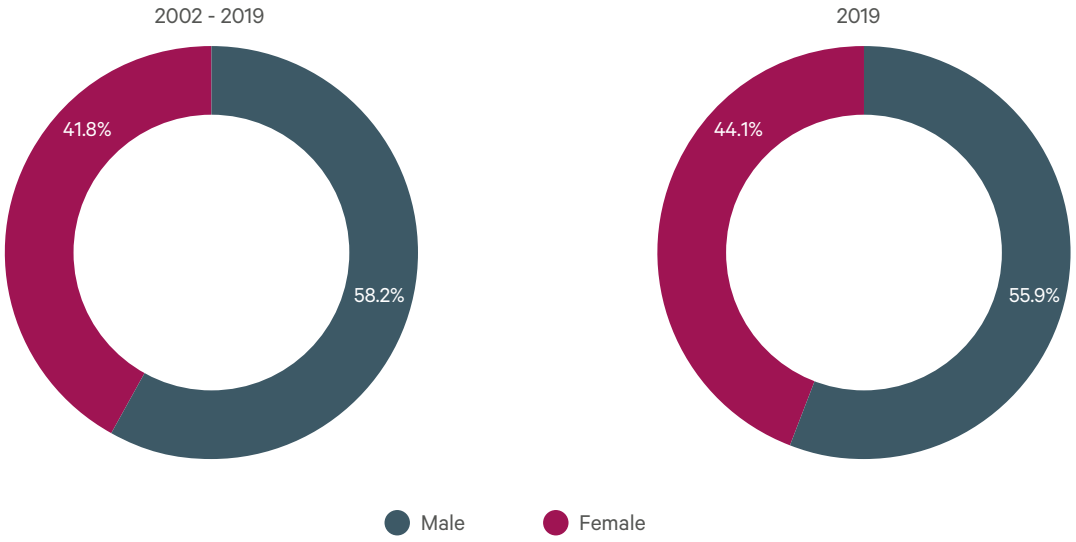
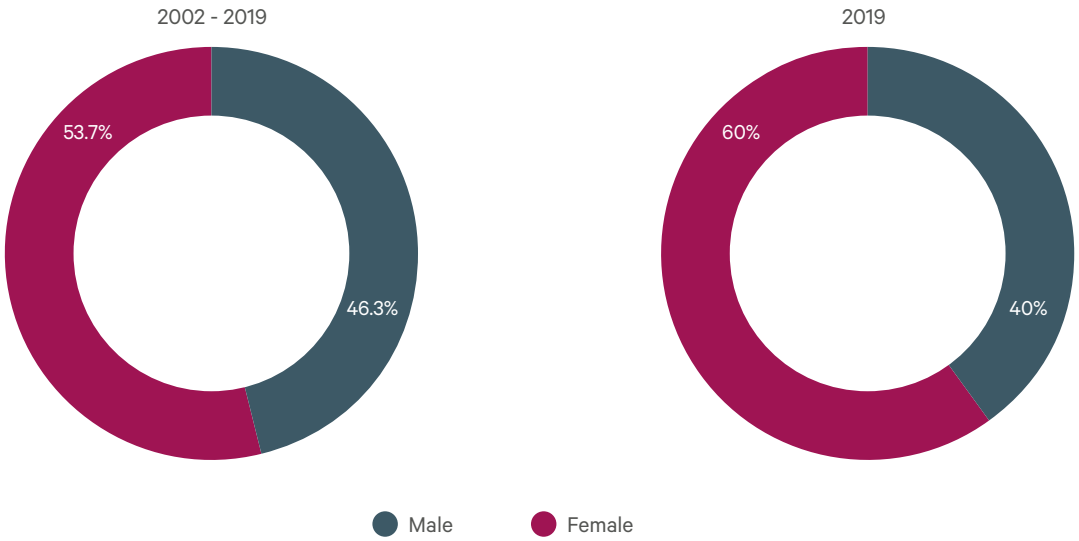


Figure 4.10: Donor sex for living donor kidney transplants 2007 – 2019



SECTION 5

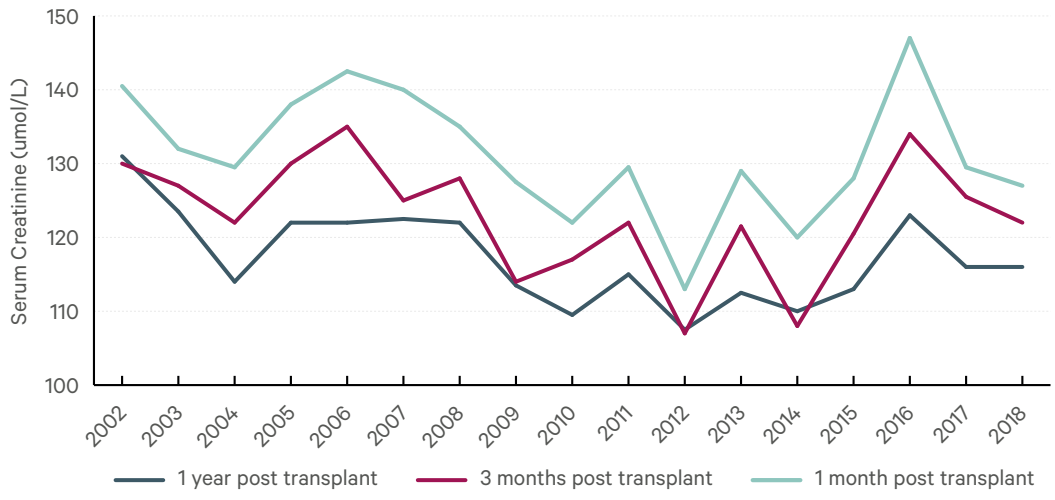
Recipient Outcomes

- **The overall median kidney transplant survival for kidneys retrieved from adult deceased donors over the past 25 years is 14.3 years, with steady improvements in outcomes over time (Table 5.1).**
- **Outcomes for first and second allografts are almost identical between 1994 and 2018 with median graft survivals for first and second deceased donor adult grafts of 14.4 and 15.0 years respectively. Third and fourth grafts reported median graft survival 9.8 and 6.1 years respectively (Table 5.3).**
- **Survival of allograft at one-year for deceased donor adult kidney recipients for 2014 – 2018 was 97.5%. Five-year allograft survival remains stable at 86% for 2009 – 2013 slightly below previous time of 87.5%. These results compare very favourably with the earliest period 1994 – 1998 where 5 year allograft survival was 71% (Table 5.5).**
- **Median patient survival for adult deceased donors between 1994 – 2018 was 21.4 years (Table 5.6).**
- **Patient survival at 1 year remained stable for the three most recent eras and was at a high of nearly 99% for the periods between 2014 – 2018. Five year survival rates improved markedly going from 84% in the initial period to 90% for 2009 - 2013 (Table 5.8).**
- **One-year allograft survival for adult living donor transplant recipients was 95%, and patient survival was 100%. Similar results were observed for paediatric recipients. Five-year allograft survival for adult living donor transplant recipients between 2007 and 2017 was 91% and patient survival was 97%. For paediatric recipients 5 year survival graft and patient survival was 96% and 100% respectively (Table 5.12).**
- **The rate of delayed graft function for deceased donor kidneys was about average in 2018 at 16% and for living donor recipients it was 10% (Figure 5.12).**
- **Instances of acute rejection, defined as either biopsy proven Banff category Type 1 or Type 2 acute cellular or vascular rejection within the first year of transplantation, have been relatively stable over the last decade at approximately 10% which was the rate for 2018 (Figure 5.13).**

5.1 DECEASED DONOR OUTCOMES

5.1.1 Renal function at 1 month, 3 months and 1 year post-transplant

Figure 5.1: Median serum creatinine post deceased donor transplant 2002 – 2018



5.1.2 Adult deceased donor kidney only allograft long term outcomes

5.1.2.1 Overall adult deceased donor allograft outcomes

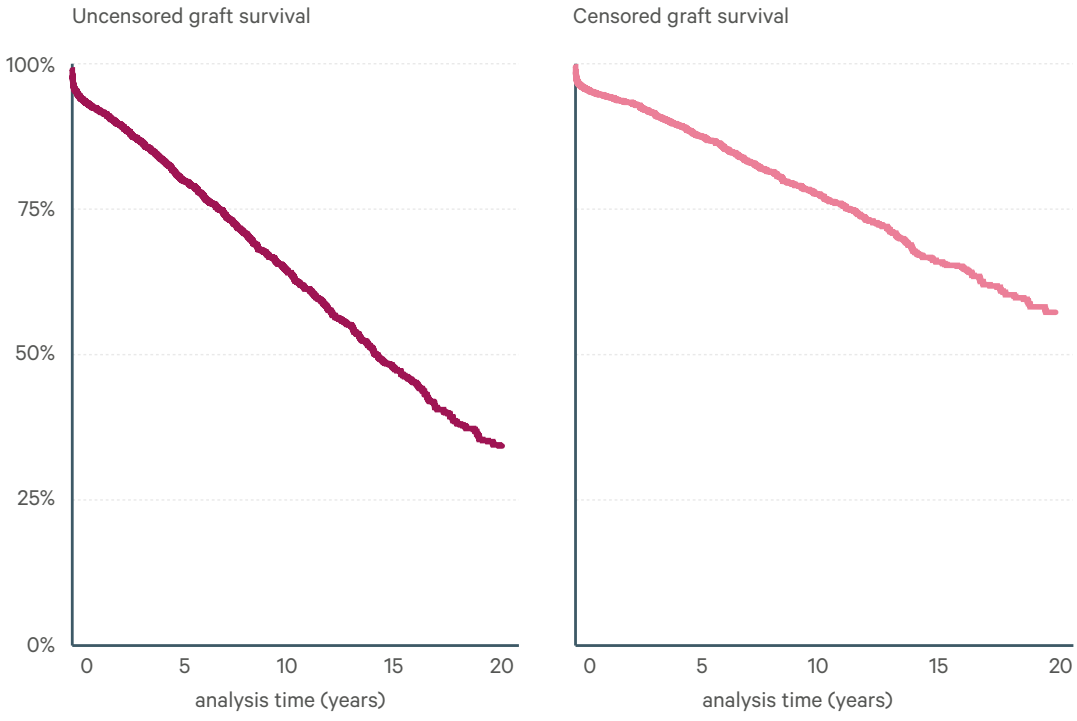
Table 5.1: Overall median adult deceased donor allograft survival 1994 – 2018

No of transplants	Median allograft survival in years [95% C.I.] Uncensored for death
2,957	14.3 [13.7 – 15.3]

Table 5.2: Adult deceased donor transplant survival 1994 – 2018

Follow up time (years)	Estimated allograft survival [95% C.I.] Uncensored for death	Estimated allograft survival [95% C.I.] Censored for death
1	93.45 [92.49 - 94.28]	95.22 [94.39 - 95.94]
5	81.37 [79.84 - 82.80]	88.41 [87.12 - 89.59]
10	65.14 [63.13 - 67.08]	78.22 [76.38 - 79.94]
15	48.15 [45.72 - 50.53]	66.80 [64.27 - 69.18]
20	34.67 [31.83 - 37.53]	57.89 [54.50 - 61.12]

Figure 5.2: Adult deceased donor kidney allograft survival 1994-2018



5.1.2.2 Adult uncensored deceased donor allograft outcomes for first and repeat transplants

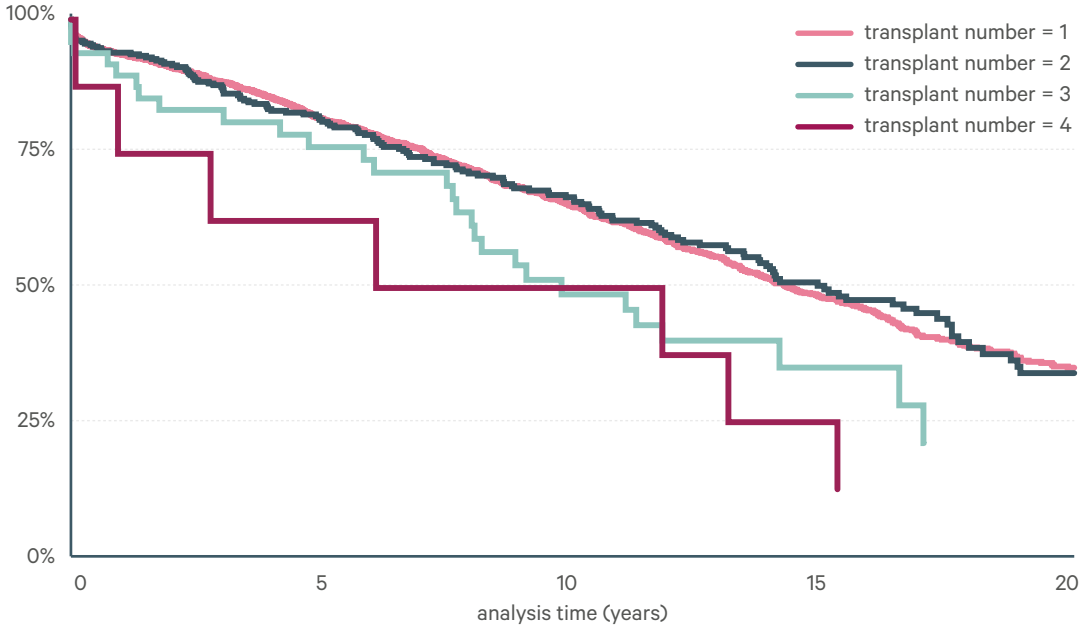
Table 5.3: Overall median allograft survival for adult deceased donor transplants 1994 – 2018

Transplant number	No of patients	Median allograft survival (years) [95% C.I.]	
1	2,542	14.4	[13.7 – 15.4]
2	358	15.0	[13.4 – 17.6]
3	48	9.8	[7.7 – 16.5]
4	8	6.1	[0.1 – 15.3]

Table 5.4: Deceased donor adult allograft survival 1994 – 2018 by transplant number

Transplant number	Follow up time (years)	Estimated percent allograft survival [95% C.I.]	
1	1	93.56	[92.53 - 94.45]
1	5	81.57	[79.92 - 83.10]
1	10	65.31	[63.11 - 67.40]
1	15	48.19	[45.53 - 50.80]
1	20	35.15	[32.05 - 38.26]
2	1	93.84	[90.80 - 95.90]
2	5	81.33	[76.68 - 85.14]
2	10	66.91	[61.16 - 72.01]
2	15	50.41	[43.79 - 56.65]
2	20	34.14	[26.34 - 42.08]
3	1	89.58	[76.77 - 95.53]
3	5	76.25	[61.16 - 86.11]
3	10	48.81	[33.00 - 62.87]
3	15	35.17	[19.64 - 51.13]
3	20	21.10	[06.78 - 40.68]
4	1	75.00	[31.48 - 93.09]
4	5	62.50	[22.93 - 86.07]
4	10	50.00	[15.20 - 77.49]
4	15	25.00	[03.71 - 55.81]
4	20	12.50	[00.01 - 42.27]

Figure 5.3: Adult deceased donor first and repeat transplants allograft survival estimates 1994 – 2018

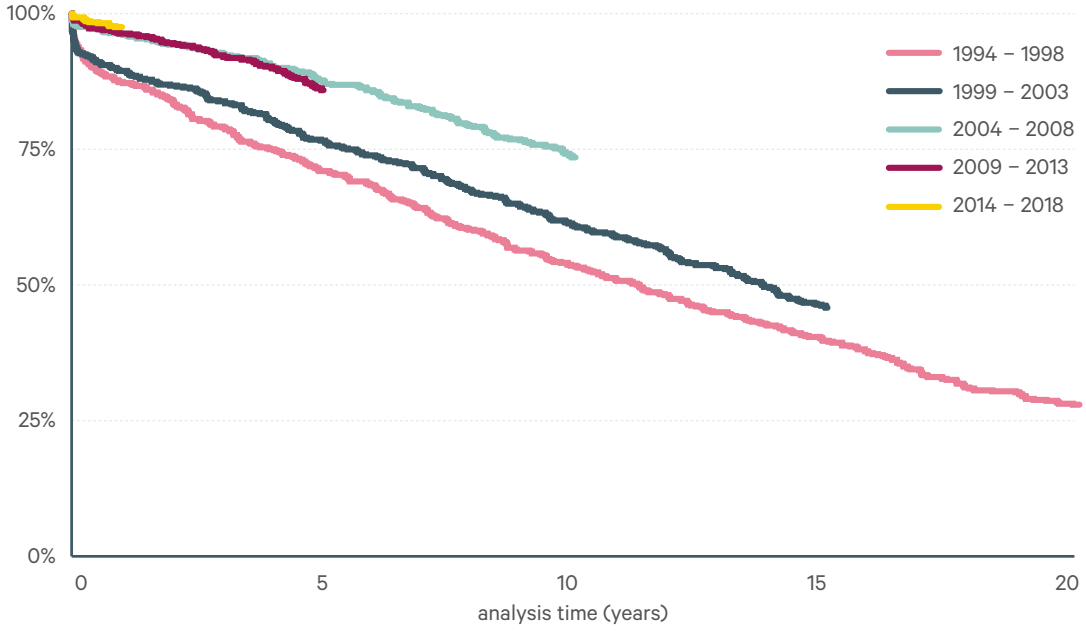


5.1.2.3 Adult uncensored deceased donor allograft outcomes by era

Table 5.5: Adult deceased donor allograft survival by era 1994 - 2018

Period transplanted	Follow up time (years)	Estimated allograft survival [95% C.I.]	
1994-1998	1	87.38	[84.38 – 89.83]
1994-1998	5	71.00	[67.10 – 74.52]
1994-1998	10	53.55	[49.39 – 57.53]
1994-1998	15	39.72	[35.71 – 43.71]
1994-1998	20	27.95	[24.33 – 31.67]
1999-2003	1	89.45	[86.59 – 91.72]
1999-2003	5	76.60	[72.85 – 79.90]
1999-2003	10	60.79	[56.58 – 64.72]
1999-2003	15	45.82	[41.61 – 49.92]
2004-2008	1	96.24	[94.40 – 97.49]
2004-2008	5	87.54	[84.65 – 89.92]
2004-2008	10	73.51	[69.81 – 76.83]
2004-2008	15		
2009-2013	1	96.33	[94.52 – 97.54]
2009-2013	5	85.90	[82.92 – 88.40]
2009-2013	10		
2009-2013	15		
2014-2018	1	97.52	[95.85– 98.52]
2014-2018	5		
2014-2018	10		
2014-2018	15		

Figure 5.4: Adult deceased donor allograft survival by era 1994 – 2018



5.1.2.4 Overall adult deceased donor patient survival

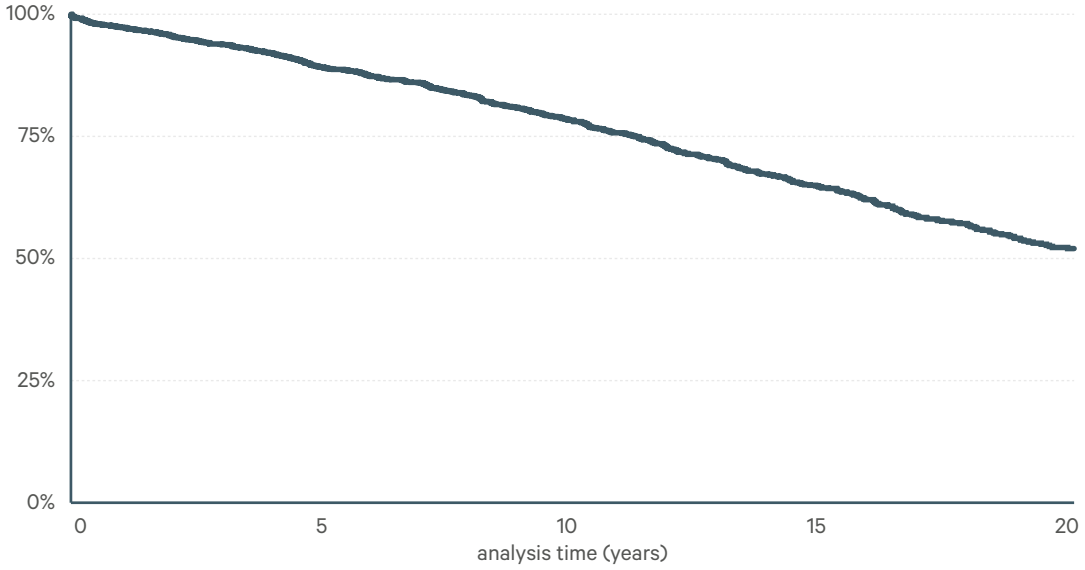
Table 5.6: Overall median adult deceased donor patient survival 1994 – 2018

No of transplants	Median patient survival (years) [95% C.I.]	
2542	21.36	[19.34 – 22.50]

Table 5.7: Estimated adult deceased donor patient survival 1994 - 2018

Follow up time (years)	Estimated patient survival [95% C.I.]	
1	97.34	[96.63 - 97.90]
5	89.21	[87.85 - 90.42]
10	78.38	[76.44 - 80.18]
15	64.55	[61.98 - 66.99]
20	52.16	[48.89 - 55.31]

Figure 5.5: Kaplan-Meier adult deceased donor patient survival estimates 1994 – 2018

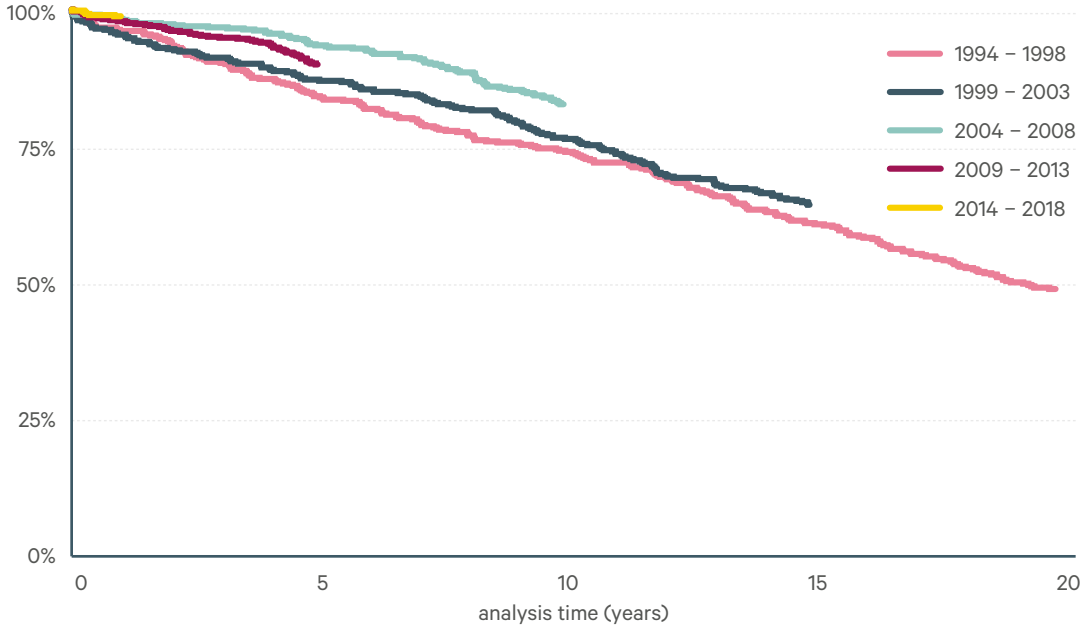


5.1.2.5 Overall adult deceased donor patient survival by era

Table 5.8: Adult deceased donor patient survival by era transplanted 1994 - 2018

Period transplanted	Follow up time (years)	Estimated patient survival [95% C.I.]	
1994-1998	1	96.08	[93.92 – 97.48]
1994-1998	5	84.15	[80.56 – 87.13]
1994-1998	10	74.18	[70.00 – 77.87]
1994-1998	15	60.94	[56.35 – 65.21]
1994-1998	20	48.89	[44.20 – 53.41]
1999-2003	1	95.41	[92.80 – 96.76]
1999-2003	5	87.18	[83.87 – 89.94]
1999-2003	10	76.56	[72.92 – 80.59]
1999-2003	15	64.30	[62.11 – 70.77]
1999-2003	20		
2004-2008	1	98.28	[96.85 – 99.20]
2004-2008	5	93.45	[89.95 – 94.59]
2004-2008	10	82.67	[79.11 – 85.81]
2004-2008	15		
2004-2008	20		
2009-2013	1	97.87	[96.47 – 98.90]
2009-2013	5	89.95	[87.63 – 92.59]
2009-2013	10		
2009-2013	15		
2009-2013	20		
2014-2018	1	98.77	[97.11 – 99.34]
2014-2018	5		
2014-2018	10		
2014-2018	15		
2014-2018	20		

Figure 5.6: Adult deceased donor patient survival by era transplanted 1994 – 2018



5.1.3. Long term outcomes for paediatric deceased donor kidney transplants

5.1.3.1 Paediatric deceased donor allograft and patient survival

Table 5.9: Overall median paediatric deceased donor allograft survival 1994 - 2018

No of transplants	Median allograft survival (years) [95% C.I.]
193	15.26 [12.94 – 21.05]

Table 5.10: Paediatric deceased donor allograft and patient survival 1994 - 2018

Follow up time (years)	Estimated ***allograft*** survival [95% C.I.]		Estimated ***patient*** survival [95% C.I.]	
1	92.22	[87.43 - 95.23]	98.28	[94.77 - 99.44]
5	81.19	[74.77 - 86.12]	97.62	[93.76 - 99.10]
10	68.02	[60.22 - 74.62]	96.89	[92.65 - 98.70]
15	50.46	[41.49 - 58.76]	90.53	[83.14 - 94.78]
20	40.96	[31.37 – 50.29]	81.80	[70.76 - 88.99]

Figure 5.7: Paediatric deceased donor allograft survival 1994 – 2018

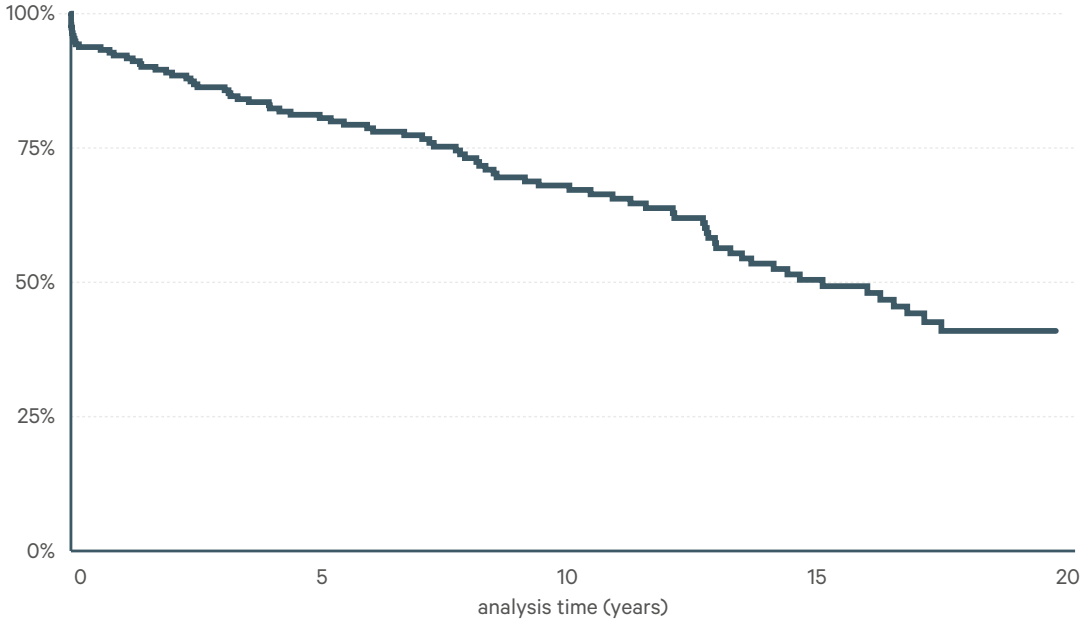
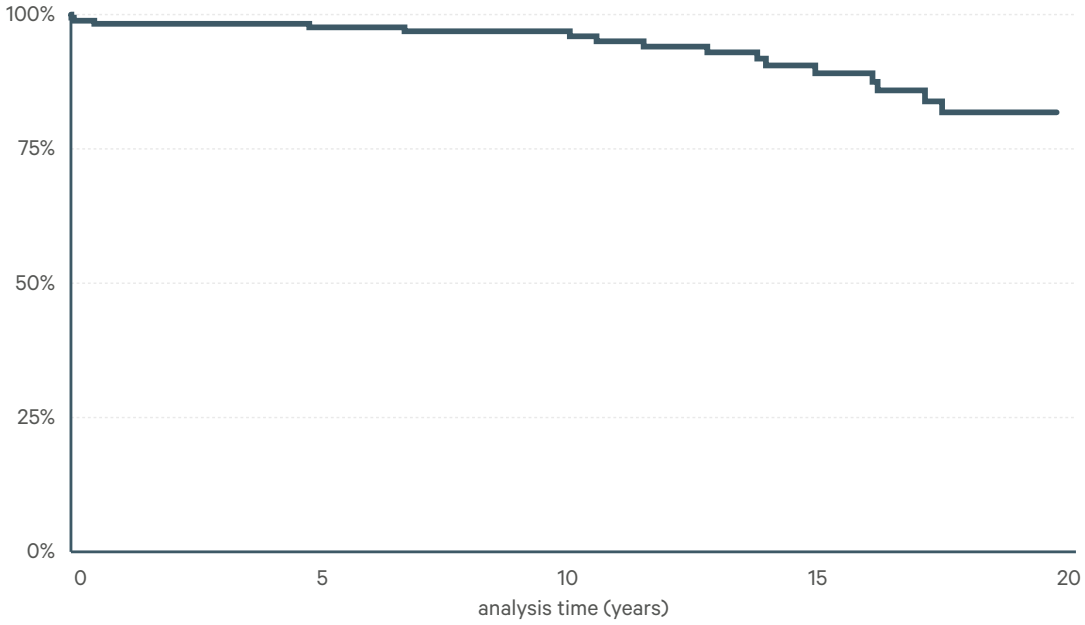


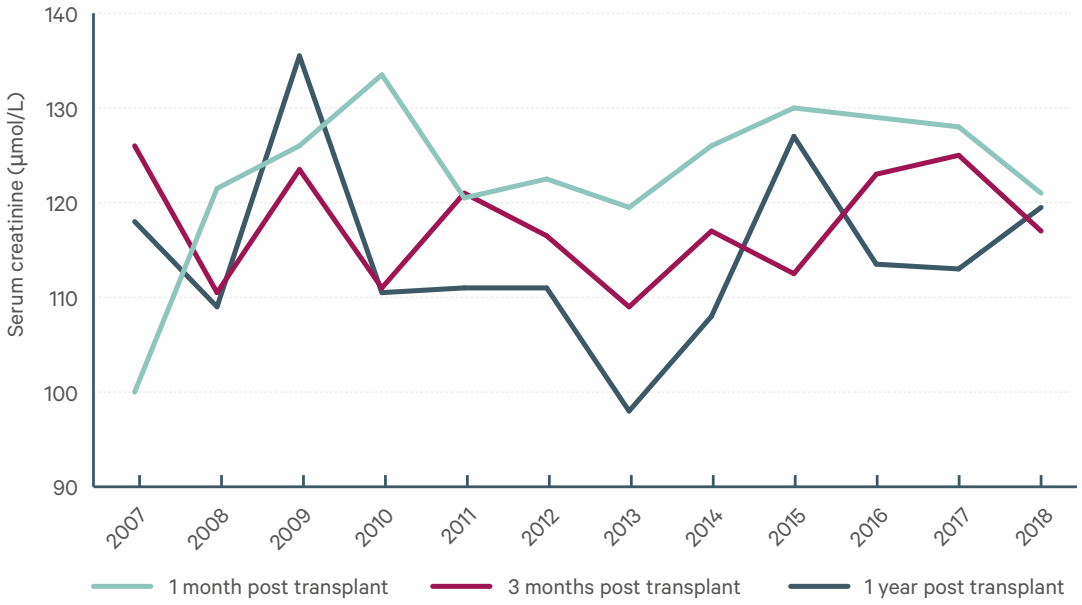
Figure 5.8: Paediatric deceased donor patient survival 1994 – 2018



5.2 LIVING DONOR OUTCOMES

5.2.1 Renal function at 1 month, 3 months and 1 year post-transplant

Figure 5.9: Median serum creatinine post living donor transplant 2007 – 2018



5.2.2 Long term outcomes for living donor kidney transplants

Table 5.11: Adult and paediatric living donor allograft and patient survival 2007 – 2018

	Allograft survival		Patient survival	
Follow up time (years)	Adult living donor allograft survival % [95% C.I]	Paediatric Living donor allograft survival % [95% C.I]	Adult living donor patient survival % [95% C.I]	Paediatric Living donor patient survival % [95% C.I]
1	95.3 [92.4 – 97.2]	95.6 [83.4–98.9]	100 [-----]	100 [-----]
3	94.1 [90.7 – 96.2]	95.6 [83.4–98.9]	99.0 [95.9 – 99.7]	100 [-----]
5	91.2 [86.8 – 94.2]	95.6 [83.4–98.9]	96.7 [92.3 – 98.6]	100 [-----]
10	76.7 [66.2 – 84.3]	62.0 [18.4–87.4]	89.4 [76.6 – 95.4]	100 [-----]

Figure 5.10: Allograft survival for adult and paediatric living donor kidney transplants 2007–2018

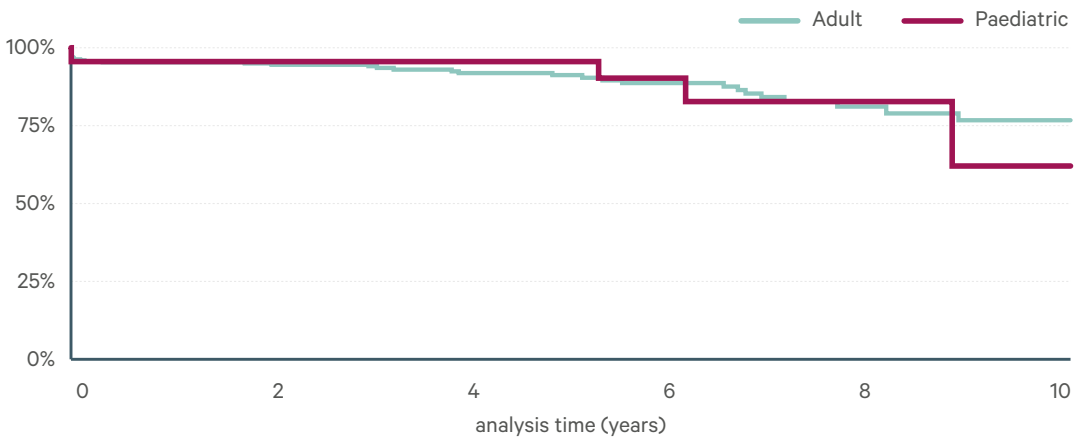
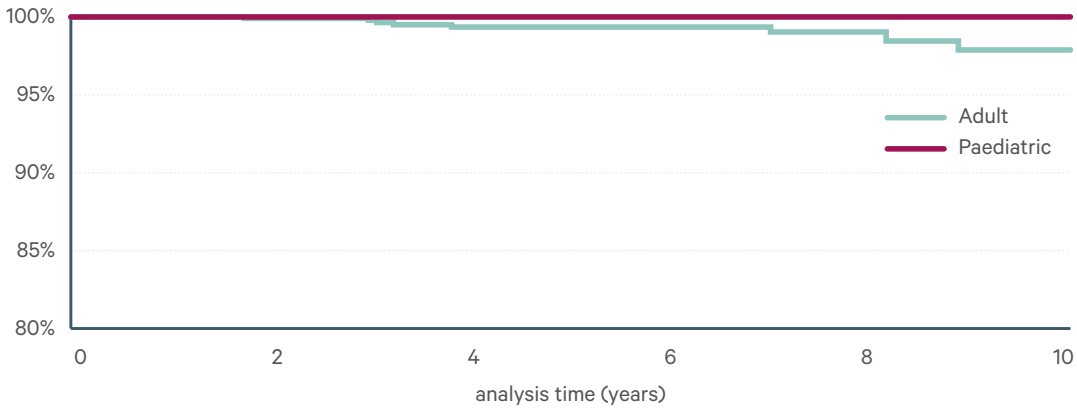


Figure 5.11: Patient survival for adult and paediatric living donor kidney transplants 2007–2018



Number of patients on kidney waiting list is gradually decreasing year on year

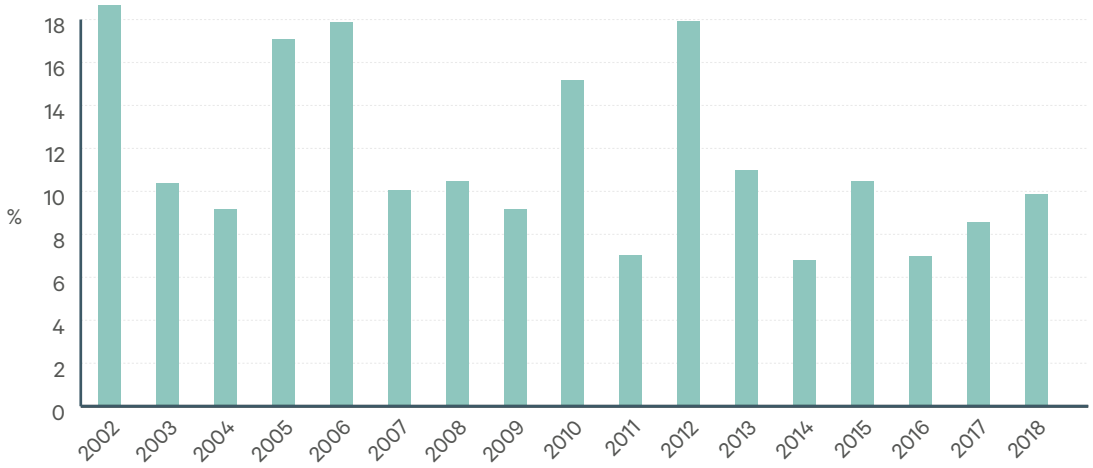
5.3 ADVERSE OUTCOMES

5.3.1 Delayed graft function and cold ischaemic time

Figure 5.12: Delayed graft function percentage post transplant 2002 – 2018

5.3.2 Biopsy proven acute rejection

Figure 5.13: Acute rejection rate 2002 – 2018



SECTION 6

International Comparisons

6.1 Comparison of Irish Kidney Transplant Outcomes with European Union (Collaborative Transplant Study)

The Collaborative Transplant Study (CTS) is based on the voluntary cooperation of transplant centres from around the world. The CTS has active support of more than 400 transplant centres in 42 countries, with more than 500,000 data sets for kidney, heart, lung, liver, and pancreas transplants collected. The study is coordinated from the Institute of Immunology of the University of Heidelberg, Germany. The Heidelberg CTS team includes physicians, immunologists, computer scientists, statisticians and laboratory staff.

The study's aims are strictly scientific. Aside from maintaining a transplant registry, the CTS conducts various prospective and retrospective studies on particular research topics.

The NKTS Beaumont Hospital provides anonymised data through a secure encrypted portal to the CTS, and they, in return, have produced graphs showing the performance of the NKTS compared to other EU centres

6.1.1 EU (CTS) comparison for kidney transplant survival outcomes

Figure 6.1: EU (CTS) comparison of adult first deceased-donor kidney Patient survival 1988 - 2017

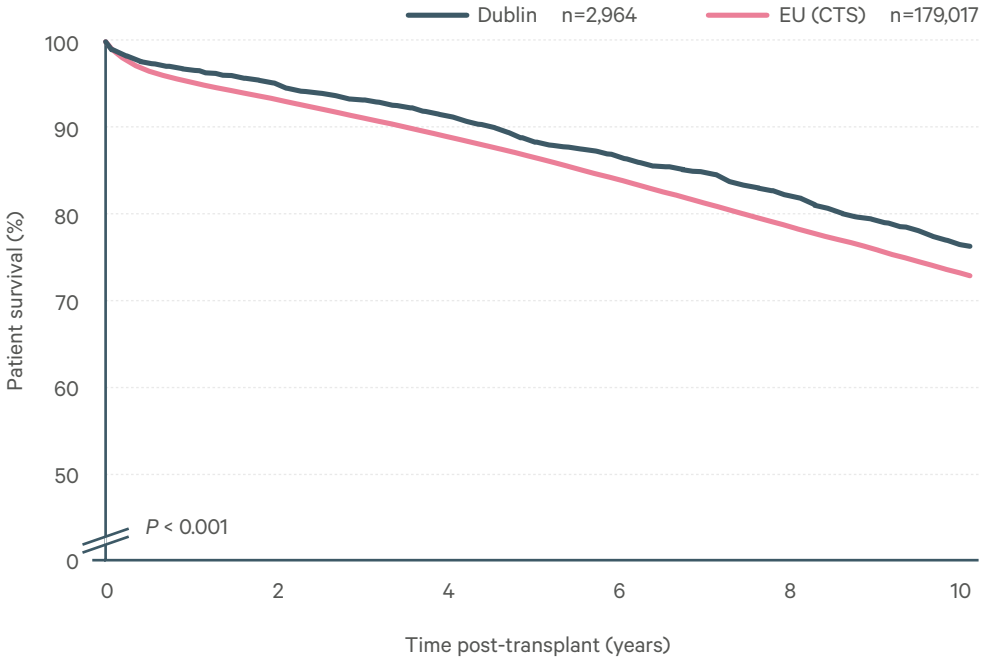


Figure 6.2: EU (CTS) comparison of adult first deceased-donor kidney Patient survival by era transplanted

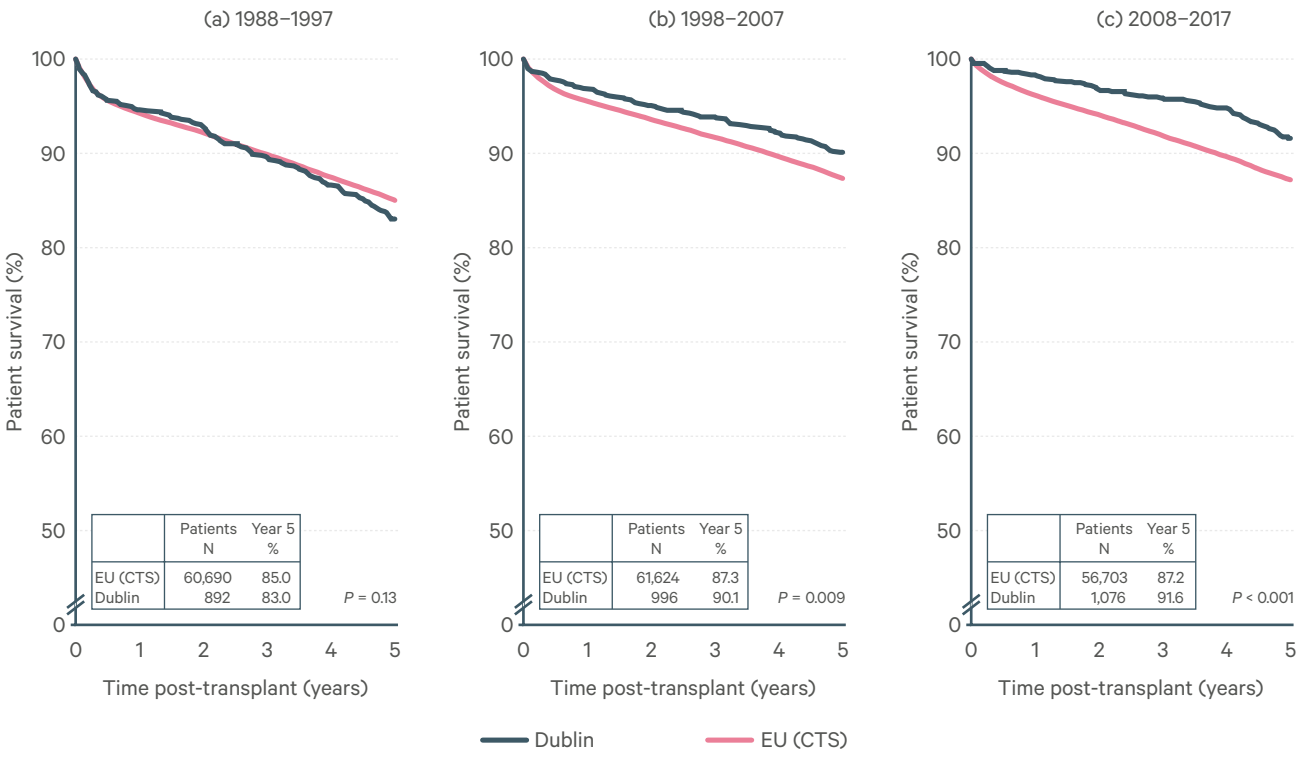


Figure 6.3: EU (CTS) comparison of adult first deceased-donor kidney Allograft survival 1988 - 2017

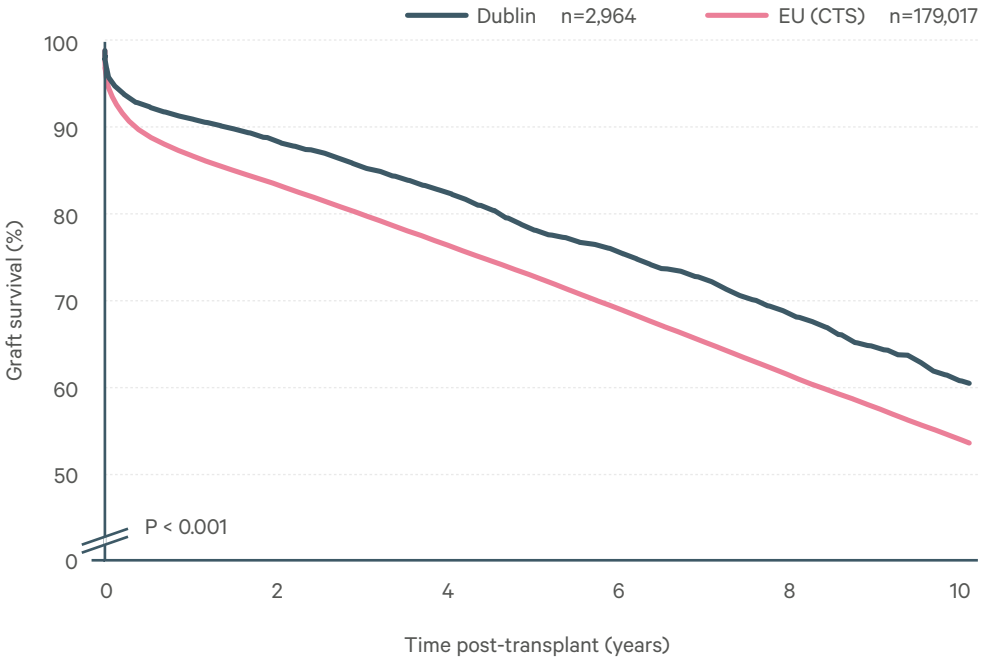
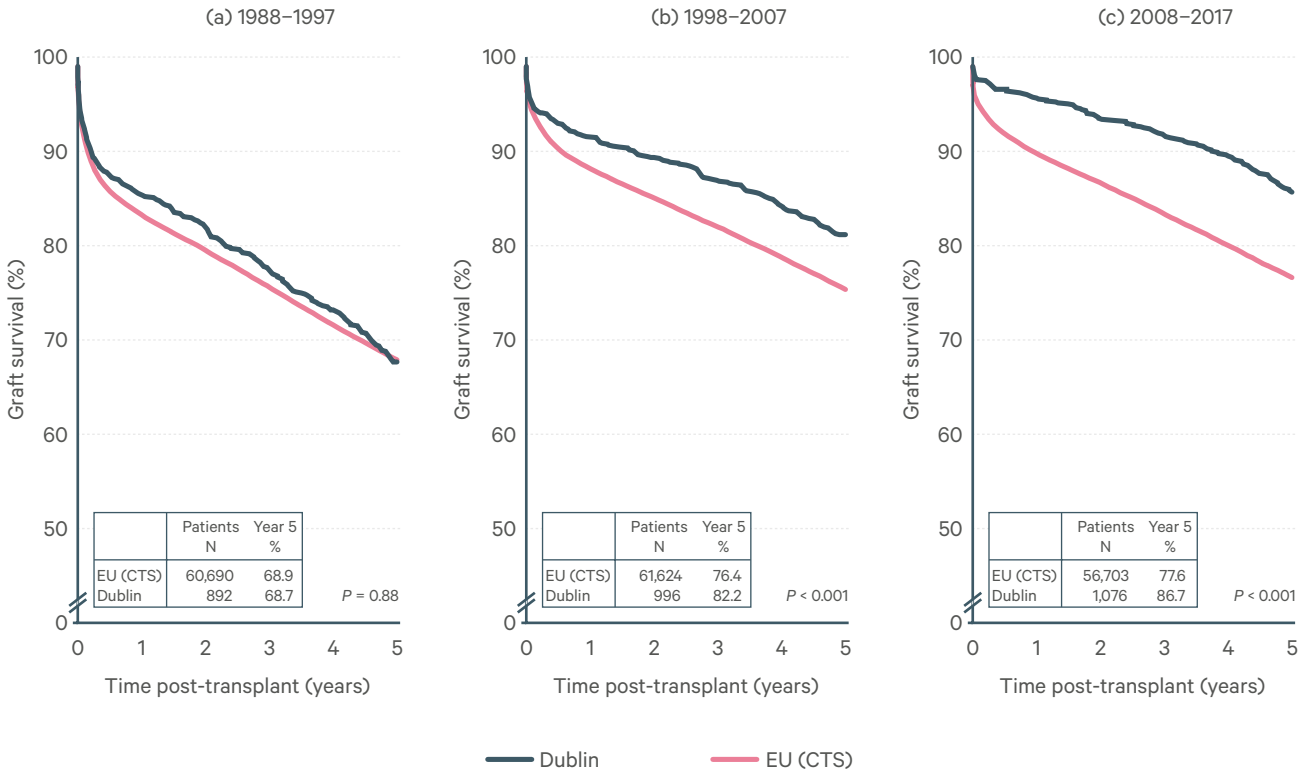


Figure 6.4: EU (CTS) comparison of adult first deceased-donor kidney Allograft survival by era



Main cause of ESRD in adults is glomerulonephritis while in children the cause is congenital

Figure 6.5: EU (CTS) comparison of adult Re-transplanted deceased-donor kidney Allograft survival by era

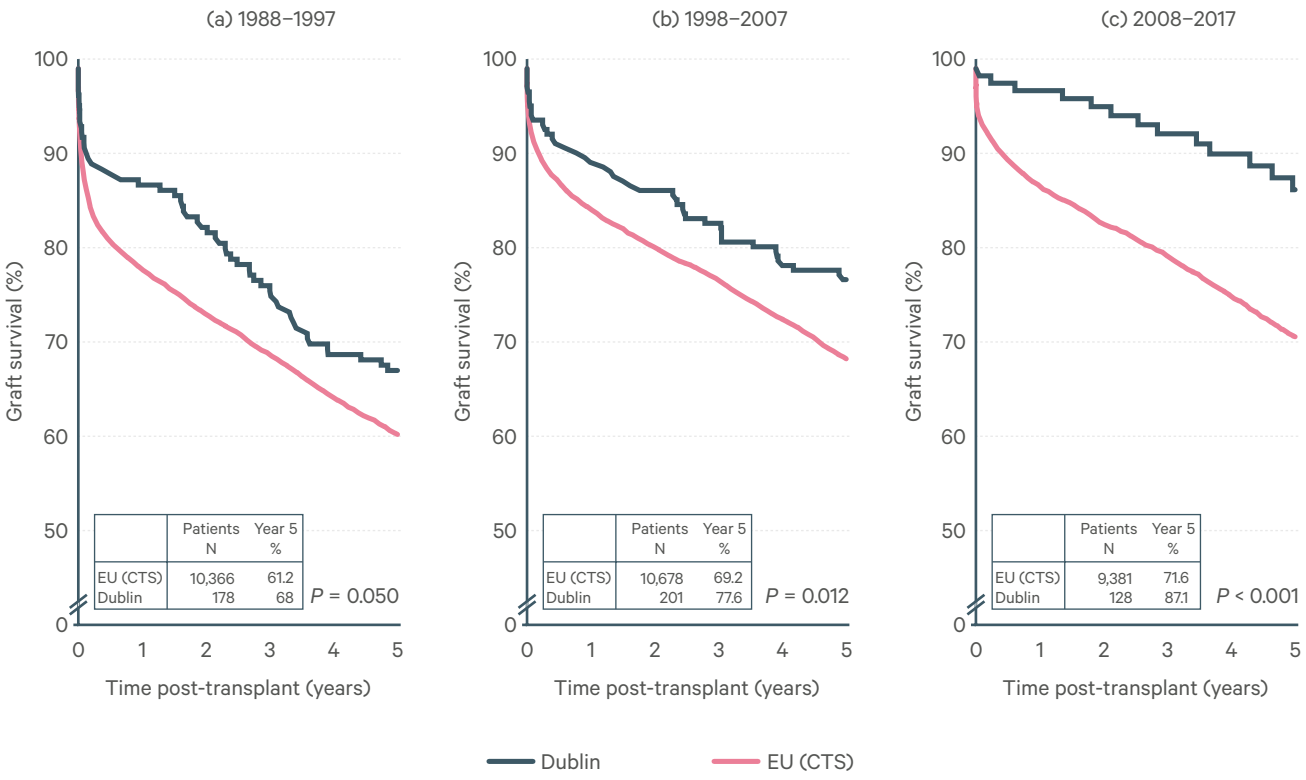


Figure 6.6: EU (CTS) comparison of paediatric first deceased-donor kidney Allograft survival in the recent era 2008 - 2017

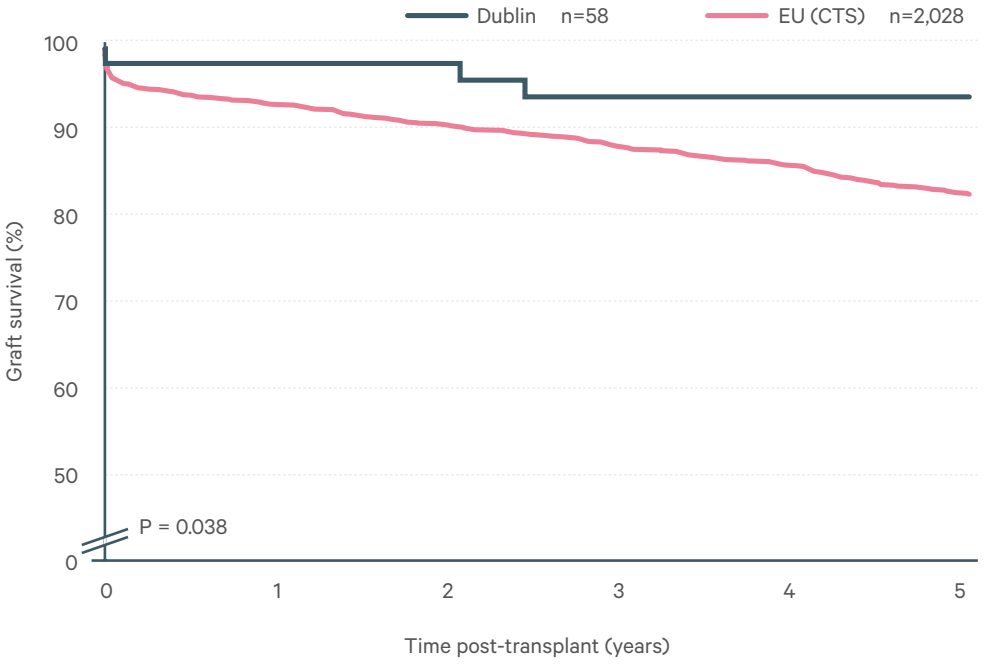


Figure 6.7: EU (CTS) comparison of adult first living-donor kidney Patient survival 2008 - 2017

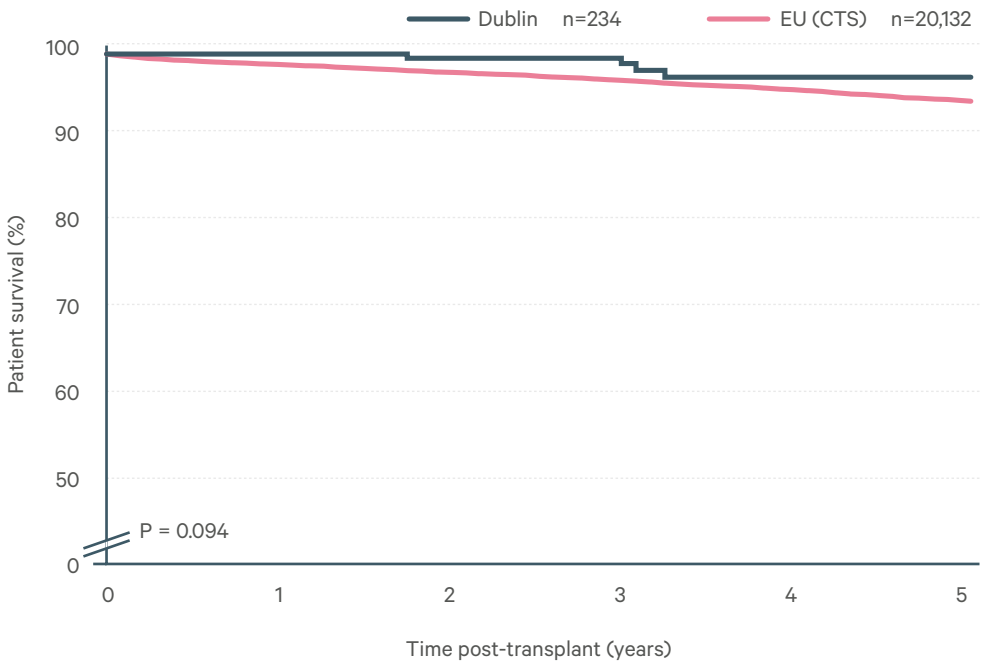


Figure 6.8: EU (CTS) comparison of adult first living-donor kidney Allograft survival 2008 - 2017

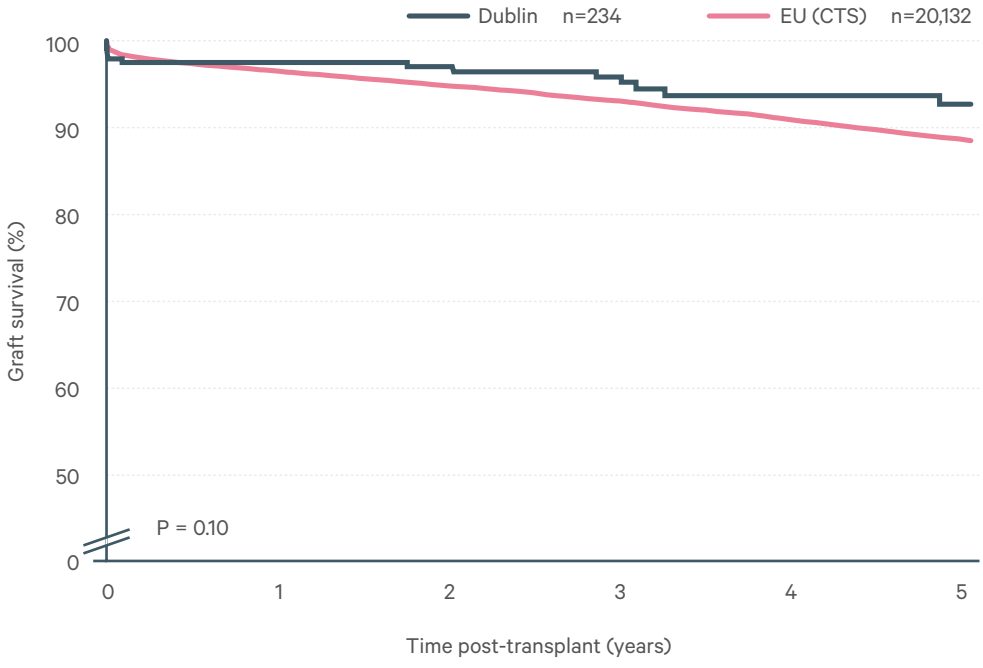
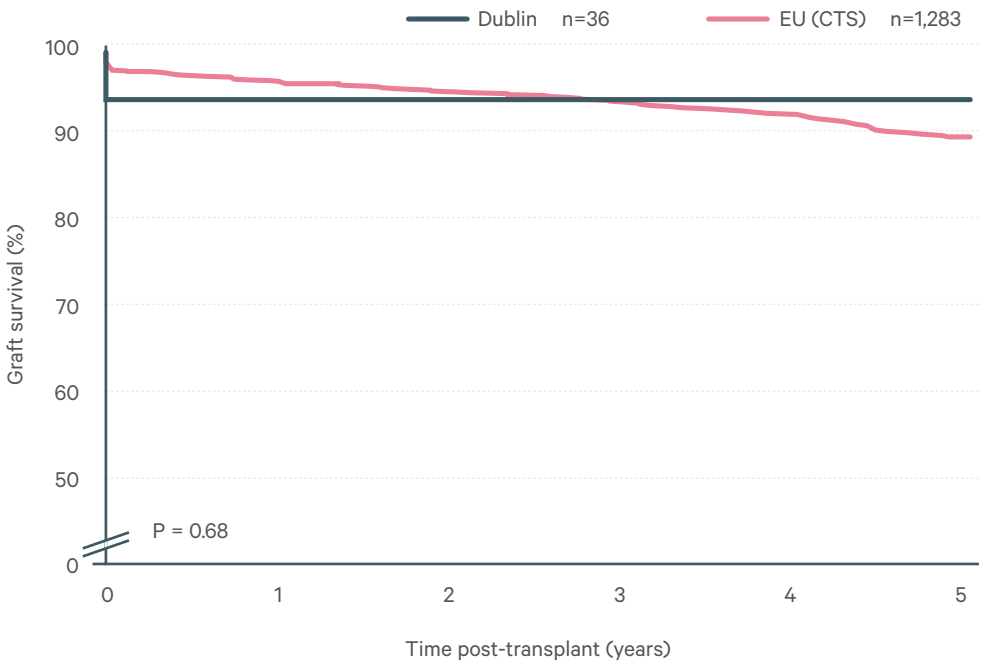


Figure 6.9: EU (CTS) comparison of paediatric first living-donor kidney Allograft survival 2008 - 2017



30% of all donations in 2019 were to highly sensitised recipients

6.2. Comparison of transplantation rates between European Renal Association (ERA)/ European Dialysis and Transplantation Association (EDTA) countries and Ireland

The ERA/EDTA Registry collects data on renal replacement therapy (RRT) via the national and regional renal registries in Europe. For this section comparisons are made between 40 ERA/EDTA countries/ regions and Ireland which is not affiliated to ERA/EDTA.

Data was gleaned from the 2017 ERA/EDTA report released in October 2019.

- **The overall kidney transplant rate PMP (per million population) is 40 for Ireland. The countries with the highest rates of kidney transplantation are Spain, Northern Ireland and Scotland with 72, 66 and 59 PMP respectively.**
- **Deceased donor kidney transplant rate PMP is 29 for Ireland. The countries with the highest rates of deceased donor kidney transplantation are Spain, France and Scotland with 64, 48 and 42 PMP respectively.**
- **Living donor kidney transplant rate PMP is 11 for Ireland. Countries with the highest rates of living donor kidney transplantation were Northern Ireland, The Netherlands and Iceland with 38, 31 and 24 PMP respectively.**

Figure 6.10: Total rates of transplantation PMP for EDTA countries and Ireland for 2017

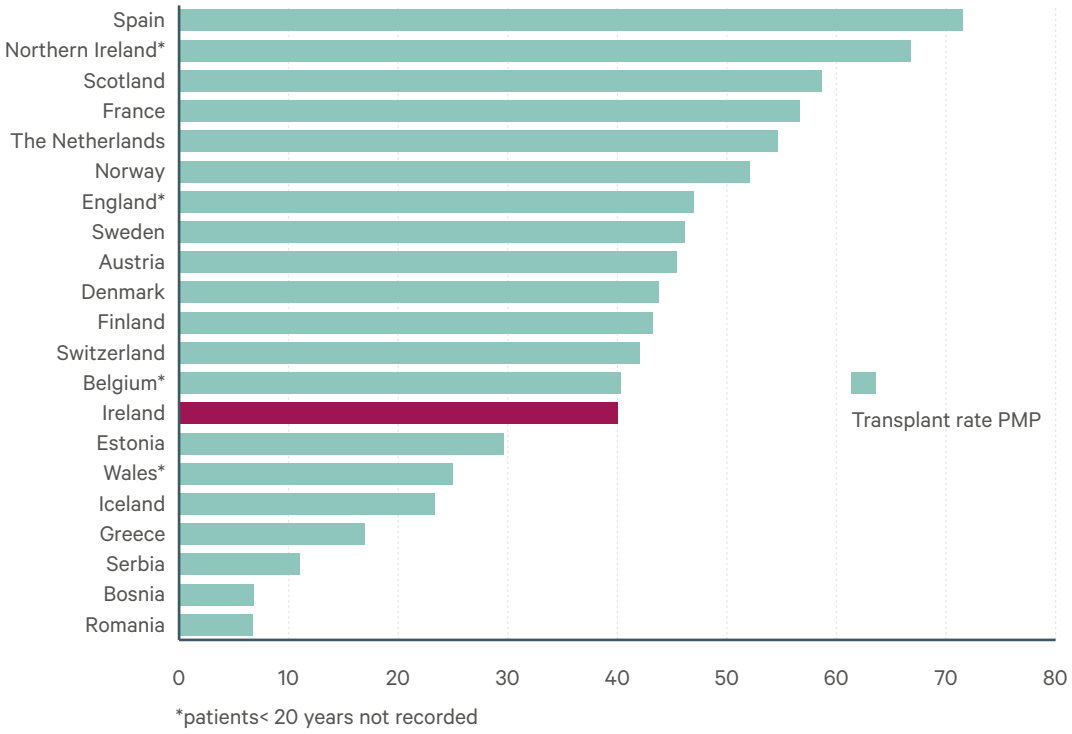


Figure 6.11: Deceased donor rates of transplantation PMP for EDTA countries and Ireland for 2017

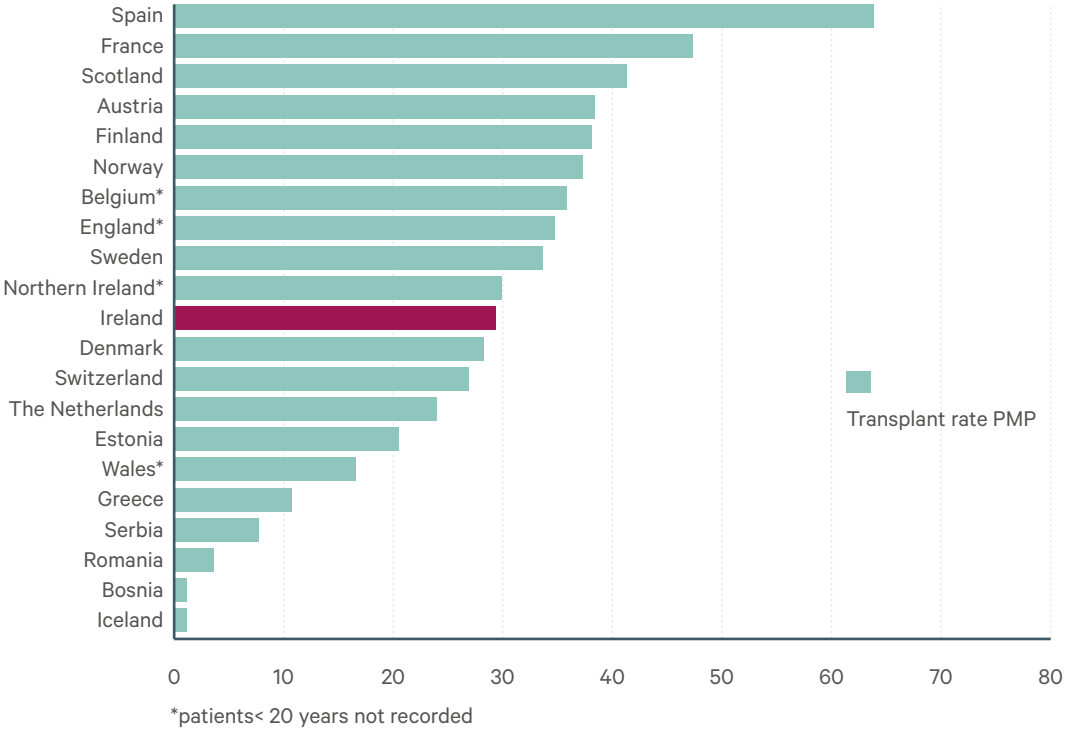
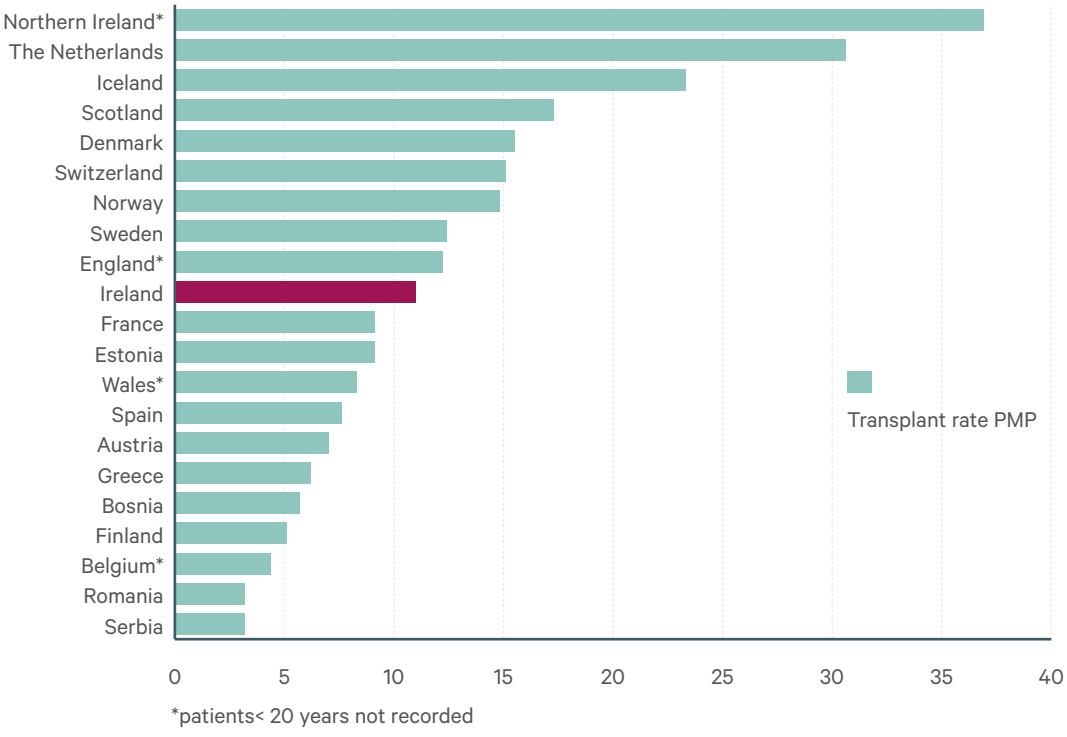


Figure 6.12: Living donor rates of transplantation PMP for EDTA countries and Ireland 2017



SECTION 7

Living Donor Outcomes

7.1 Introduction

Donor organ shortage is a major problem for patients within the European Union resulting in long waiting times for organ transplantation. In addition to transplantation with a graft from a deceased donor, living donor organ transplantation is an option. Receiving a kidney transplant from a living recipient has many advantages over deceased donation including increased graft and patient survival, reduction in rejection rates and waiting times, plus the added benefit that surgery can be scheduled.

With the increase in numbers of living donor kidney transplants the health of the donor should be monitored regularly. Therefore follow-up with a nephrologist ensures that there is no additional exposure to adverse incidents as a result of the nephrectomy. Long term follow up data on kidney donors provides insight and information in the long term safety and possible health risks of living donation for the donor.

As stated in article 15 of the "Directive 2010/53/EU of the European Parliament countries within the European Union are obliged by law to have a follow up system for living kidney donors ,and this was legislated into Irish law in August 2012.

- **2019 was a busy year for the living kidney donor programme. During the year, 199 potential donors were immunologically evaluated for 112 potential recipient and 95 potential donors were medically assessed and underwent investigations to determine their suitability to proceed with donation. This reflects an increase in activity within the programme, year on year and included 7 potential donors who were willing to enter the Shared Kidney Exchange Programme, in collaboration with colleagues in the UK and 2 donors who were planning to donate their kidney to potential recipients overseas. Of the 95 potential donors assessed in 2019, the conversion rate to completing a living donor transplant was reduced at 25 compared to recent previous years due to a number of factors including the donor being immunologically incompatible with the recipient (24), the donor being medically unfit to proceed (22), donor choice regarding timing of surgery, the recipient receiving a deceased donor transplant during the donor evaluation process (11). In total 5 living donors withdrew from the process. A number of potential living donors evaluated in 2019 have now progressed to final assessment stage and have been given dates for surgery. Currently, 14 patients have received provisional dates for transplant and 24 new potential donors are booked for revaluation , since the beginning of 2020.**

- **Donor safety and well-being are obviously paramount to the continuation of the programme. We strive to optimize each donor to ensure that they are fit to proceed – this may require lifestyle changes such as weight loss or smoking cessation. Clearly, these processes take time to achieve, but benefit the health of the donor. On average, the time taken from the start of the medical assessment to donation is 152 days.**

- **In the period 2001 - 2019 donation to adults occurs mainly between siblings (52%), spouses (16%), parents (15%) and children (9%). However for paediatric recipients, parents are in the majority at 86% (Figure 7.1).**

- **Overall females are more likely to donate at 53% amongst all categories of relations with males are more likely to donate to parents (52%) or other relation (53%) and females more likely to donate to spouses (75%) and to non relatives (68%). Both sexes are equally divided into donating to children (50%) (Figure 7.2).**

- **Median age at donation was 44 overall with unrelated donors having a median age of 52 years and child donation at 33 years. Spousal and unrelated donors are generally of the older age groups while the youngest age groups are identified in adult children donating to parents. The spread of donor ages ranged from 20 to 72 (Figure 7.3).**

- **The median length of stay post operatively is 5 days for all donors as represented by different age groups (Figure 7.4).**

- **All living donors are offered an annual follow-up with their local nephrologist, and 76% of living donors are availing of this service. The median length of time of follow up is 26 months ranging from 1 month to 193 months (16.1 years).**

- **On follow-up, 12 % of donors developed hypertension post donation ranging from 8% in the 35 – 44 age group to 18% in the age groups >= 55 years (Figure 7.5).**

- **As expected the EGFR is lowered post donation, but raises in the following years ranging from a median of 99 (umol/L) pre donation to 65 (umol/L) at 5 years post donation (Figure 7.6).**

Figure 7.1: Adult/ Paediatric Recipient by donor type of relation

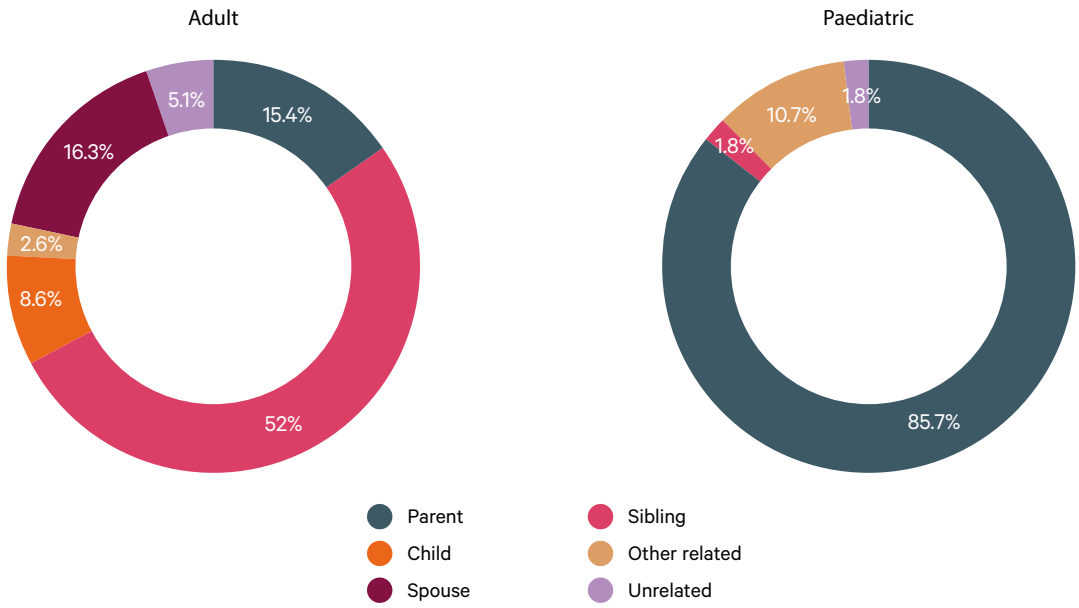


Figure 7.2: Percentage Donor sex by donor type of relation

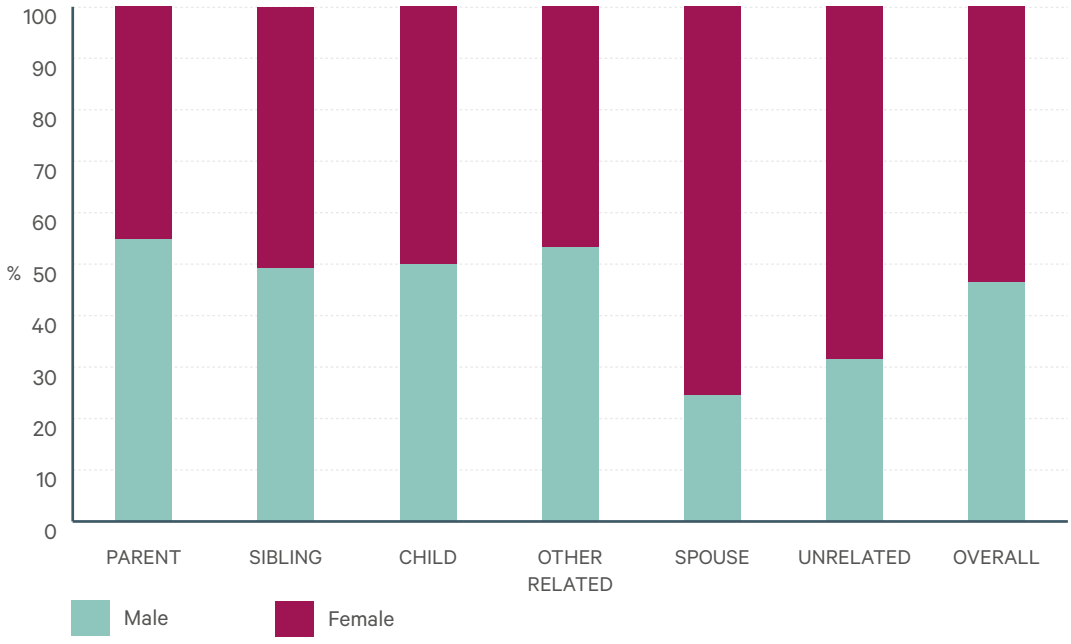


Figure 7.3: Percentage Donor age groups by donor type of relation

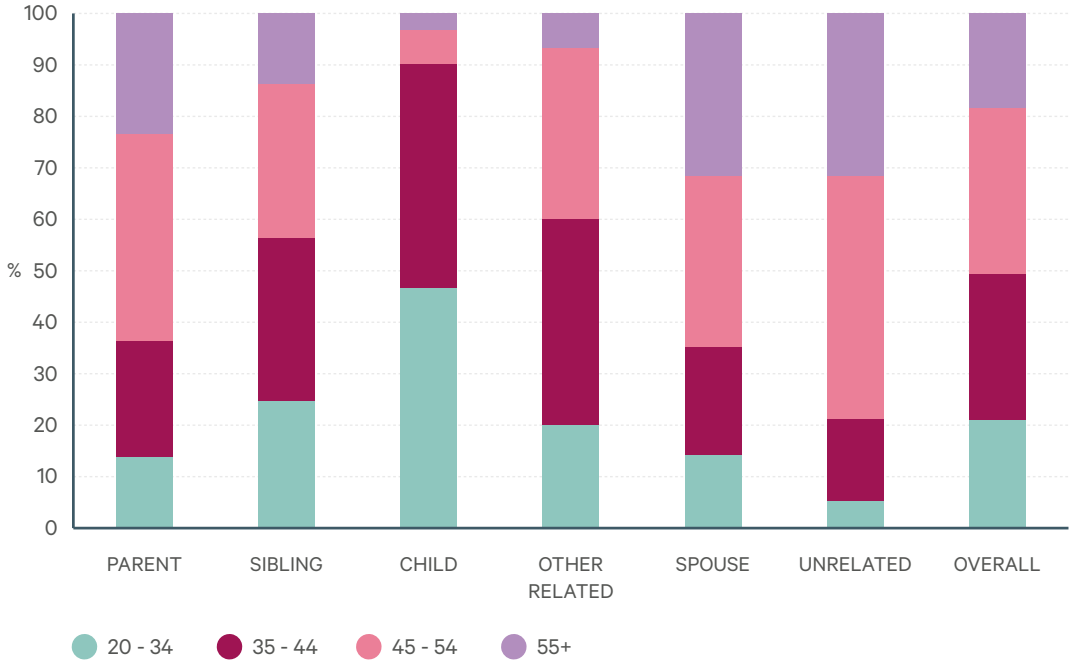


Figure 7.4: Length of stay of donors by donor age

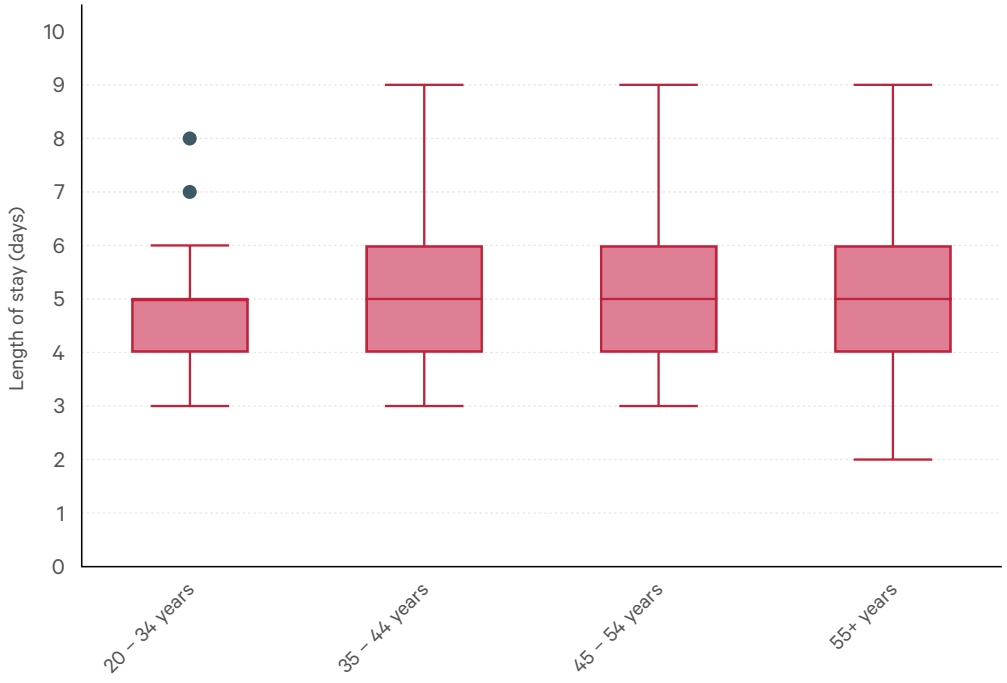


Figure 7.5: Percentage of post donation hypertension by donor age group

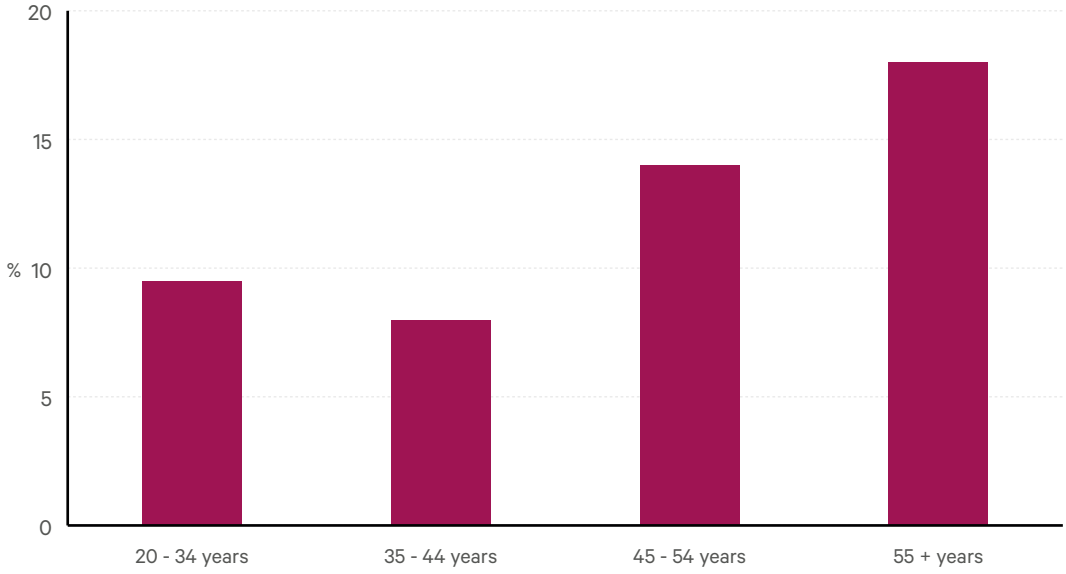
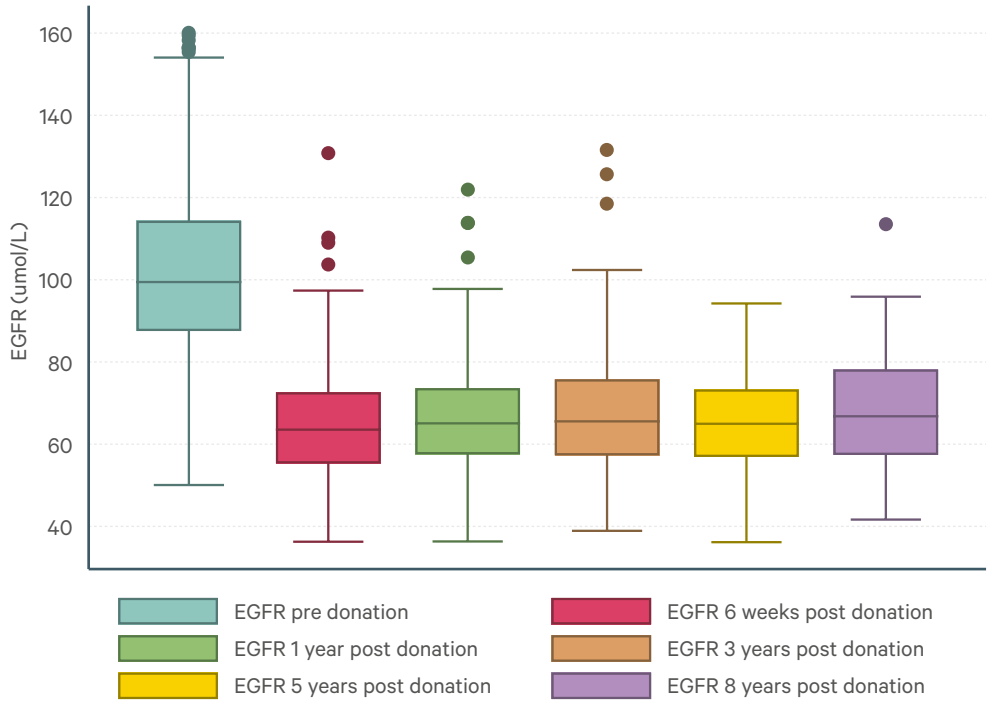


Figure 7.6: GFR for living donors pre and post donation



Staff List

In preparing this Annual Report, the Directorate Team would like to acknowledge the generosity of all kidney donors whose 'Gift of Life' makes each transplant a reality. We also recognise the extremely hard work of the Transplant Team and indeed all the staff in Beaumont Hospital. In particular, we wish to recognise the following people whose dedication and commitment have hugely contributed to the high quality of care afforded to our patients.

Consultants
Ms Dilly Little Consultant Transplant Surgeon
Mr Gordon Smyth Consultant Transplant Surgeon
Mr Ponnusamy Mohan Consultant Transplant Surgeon
Mr Richard Power Consultant Transplant Surgeon
Mr James Forde Consultant Transplant Surgeon
Mr Ian Robertson Consultant Transplant Surgeon
Prof Conall O'Seaghdha Consultant Nephrologist
Prof Peter Conlon Consultant Nephrologist
Dr Colm Magee Consultant Nephrologist
Prof Declan DeFreitas Consultant Nephrologist
Dr Mark Denton Consultant Nephrologist
Mr Denis Murphy Independent Medical Assessor
All Consultant nephrologists nationally
NCHD staff at Beaumont Hospital for urology and nephrology services

Nursing team
Ms Melanie McDonnell Directorate Nurse Manager
Ms Monica Cunningham CNM2 St Damien's Transplant Unit
Mr Enda Maguire CNM1 St Damien's Transplant Unit
Ms Somy Alex Transplant CNS
Ms Marisa Pinheiro Transplant CNS
All transplant nursing, healthcare & household staff

Transplant Co-ordinators
Ms Laura Austin CMN3
Ms Andrea Fitzmaurice CMN2
Ms Laura Lynch CNM2
Ms Marion Stacey CMN2
Ms Emma O'Hart CMN2

Renal day care nursing team
Ms Fiona Auguste CNM2 Renal day care
Ms Ciara Tolan CNM1 Renal day care
Ms Olive McEnroe CNM Ambulatory care
Ms Louise McSkeane CNM Ambulatory care
Ms Ruth O'Malley CNM Ambulatory care
Ms Mary T Murphy Patient Care Coordinator
Ms Andrea Scully Patient Care Coordinator
Ms Jane Ormond Patient Care Coordinator
All renal day care nursing staff

St Peters and Acute Dialysis Team
Ms Veronica Francis CNM 3 Haemodialysis
Ms Gerardine Maguire CNM 2
All dialysis nursing, healthcare & household staff

TUN Directorate Staff
Mr Tom Moran Directorate Business Manager
Mr Binu Vasu Renal IT Manager
Mr Patrick O'Kelly Statistician
Ms Yvonne Williams Renal Scientific Officer
Ms Sinead Cronnolly Quality Manager
Ms Caroline Hughes
Ms Mary Sullivan
Ms Claire Kavanagh
Ms Laura Byrne

Clerical Staff
Ms Edel Bates
Ms Jennifer Cronin
Ms Kim Kavanagh
Ms Mary Dowdall
Ms Rita Mather
Ms Joan Long
Ms Rebecca Kavanagh
Mr Derek Pigott
Ms Gillian O'Rourke
Ms Aisling Connolly
and ward clerks Marie Fitzpatrick, Mary Butler, Liz Mythen,
Betty Pender & Denise Redmond

Critical Care and Anaesthetic Directorate, Beaumont Hospital
Dr Margaret Bourke Clinical Director
Dr Michael Moore Consultant Anaesthetist
Dr Sinead Galvin Consultant Anaesthetist
Dr Tanya O'Neill Consultant Anaesthetist
Dr James O'Rourke Consultant Anaesthetist
Dr Alan Gaffney Consultant Anaesthetist
Ms Sinead Connolly Directorate Nurse Manager
Ms Clare Morris ADON
Ms Sinead Edney CNM2
Ms Eileen Buckley CNM2
Mr Boas Jayaprakasam CNM2
And all the Beaumont Theatre Nursing Staff

Department of HistoPathology
Dr T Dorman Consultant Pathologist
Dr B Doyle Consultant Pathologist
HistoPathology Scientists

Department of NHISSOT
Dr Mary Keogan Consultant Immunologist
Dr Khairin Khalib Consultant Immunologist
Ms Geraldine Donnelly Chief Medical Scientist
All Scientists and staff in NHISSOT

Dept of Psychiatry & Psychology
Dr Siobhan MacHale Consultant Psychiatrist
Ms Diane Gillian Psychologist
Ms Tara Power Social Worker

Department of Radiology
Dr Martina Morrin Consultant Radiologist
Dr Ruth Dunne Consultant Radiologist
Dr Aoife McErlean Consultant Radiologist
Dr Jane Cunningham Consultant Radiologist
Dr Andrew McGrath Consultant Radiologist
Dr Seamus Looby Clinical Director
Prof Michael Lee Consultant Radiologist
and all Radiologists and radiographers

Paediatric Services at Temple Street and Crumlin
Dr Atif Awan Consultant Nephrologist
Temple Street Children's University Hospital
Dr Mary Waldron Consultant Nephrologist Crumlin Hospital
Dr Niamh Dolan Consultant Nephrologist Temple Street Children's University Hospital
Dr Clodagh Sweeney Consultant Nephrologist Temple Street Children's University Hospital
Dr Maria Stack Consultant Nephrologist Temple Street Children's University Hospital
Dr Michael Riordan Consultant Nephrologist Temple Street Children's University Hospital
Mr Feargal Quinn Consultant Paediatric Urologist Crumlin Hospital
Dept of Anaesthesia in Temple Street Children's University Hospital and all the Theatre
and ward nursing staff in Temple Street Children's University Hospital

Proteins Laboratory
Ms Geraldine Collier Principle Biochemist
All Scientists and staff in Laboratory Directorate

Transplant Porters
Noel Flood
Mark Dunne
All Portering Staff in Beaumont Hospital

“ Having a transplant gives you your life back in so many small ways. It also gives you the energy to look outwards in life again.”

BEAUMONT HOSPITAL FOUNDATION

PLEASE DONATE TODAY

Online at Beaumont Hospital Foundation website at: www.beaumontfundraising.ie

By phone using credit/debit cards by calling BHF 01 809 2161

In person at the BHF desk in main reception

By post making cheques payable to Beaumont Hospital Foundation and posting to FAO Kidney Transplant Unit, Beaumont Hospital Foundation, Beaumont Hospital, Dublin 9.

Francis Quinn
Kidney Transplant Recipient

I received my 2nd transplant on Sunday morning 11th September. After surgery, in the recovery room, I knew immediately the transplant was working as I felt a warm feeling and just knew I'd be fine - I am positive person, so this helps. Before I had the transplant I knew what to expect and how I was planning on recovering to get back to full health since this was my second transplant. I set myself small goals and knew where I wanted to be each day on the path to recovery.

National
Kidney
Transplant
Service

Beaumont Hospital, Dublin 9.
T: (01) 809 3119 or (01) 809 2759
E: transplantcoordinators@beaumont.ie
www.beaumont.ie/kidneycentre

Francis Quinn
Kidney Transplant Recipient