National Kidney Transplant Service

Annual Report
2020

National
Kidney
Transplant
Service

Contents

Acknowledgements

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

Editorial Team

Dilly Little, Colm Magee, Patrick O'Kelly, Anne Cooney.

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Foreword

Successful kidney transplantation is the best treatment for patients with end stage kidney disease, allowing them to regain quality of life, freedom from dialysis and improving their overall health. The National Kidney Transplant Service (NKTS) remains committed to the provision of a high-quality kidney transplant service and more than 5500 successful kidney transplants have been performed to date. Currently, over 2500 recipients enjoy the benefits of a functioning transplant. Increasingly, potential kidney transplant recipients are identifying a living kidney donor and we have performed 387 living kidney donor transplants in the past 11 years, allowing these recipients enjoy all the benefits of a transplant predicted to give long-lasting excellent function.

Clearly, none of this would be possible without the extraordinary generosity of deceased donor families and friends who consent to organ donation in the midst of their grief. Equally, the courage of the living donor who undergoes major surgery to restore the health of their recipient must be admired. The transplant team at the NKTS wishes to acknowledge in a very special way each and every kidney donor. We see first-hand the extraordinary transformation that each successful transplant brings.

Ms Dilly Little
Surgical Director, NKTS

Dr. Colm Magee
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 2020

19

The median waiting time to transplant in 2020 was 19 months

2,579

2,579 recipients with functioning transplants at the end of 2020

21

21 highly sensitised patients (PGen ≥ 85%) were transplanted in 2020

123

123 patients transplanted in 2020 despite the COVID-19 pandemic

>

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, reflecting the fact that the NKTS continues to seek improvements in their service

SECTION 1

Introduction

Kidney Transplantation is the best treatment option for patients with end stage kidney disease, offering improved survival and quality of life for those undergoing a successful transplant. The global pandemic of COVID-19 has presented unique challenges to transplant services worldwide and the National Kidney Transplant Service (NKTS) has certainly not been exempt from these difficulties. This Annual Report (2020) 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 kidney transplant.

We performed 123 kidney transplants at the National Kidney Transplant Service in 2020. On the 6th March 2020, the first case of COVID-19 virus was diagnosed in the Republic of Ireland. With increasing numbers of cases diagnosed daily from this date, the NKTS sought advice from the National Public Health Emergency Team. Their advice indicated that transplantation services should be limited to emergency liver and cardiac transplantation where the predicted survival of the potential recipient without a successful transplant was estimated in months. Because of the risk of immunosuppression required for successful transplantation, the risks for an individual patient who would contract COVID-19 in the immediate period post kidney transplantation was deemed to be extremely high, as their ability to fight infection would be impaired by the immunosuppression.

In April and May 2020, the country experienced an initial peak in numbers of COVID-19 cases admitted to intensive care units (ICU's) countrywide, impacting on the donor hospitals' ability to refer deceased donors in a COVID-19 negative environment. Equally, providing a COVID-19 free environment for a potential kidney transplant recipient within Beaumont hospital proved challenging. However, due to the strenuous work of the staff in Beaumont Hospital and the NKTS and with the reduction of the COVID-19 caseload countrywide, we resumed kidney transplantation on 28th May 2020, after a hiatus of approximately 10 weeks.

During that 10 week period, we received 12 donor offers from Organ Donation and Transplant Ireland (ODTI) that we regrettably, were unable to convert to transplant. Kidney transplantation has continued uninterrupted since recommencing in May, through 2 subsequent waves of the pandemic.

Kidney transplantation has continued uninterrupted since recommencing in May, through 2 subsequent waves of the pandemic

Because the outcomes from acquiring COVID-19 in the immunocompromised are so poor, it is essential that transplant patients cocoon at home during the early post-transplant period. However, patients also require intensive follow-up during this time, typically needing to attend hospital 12 times in the first 6 weeks. In order to continue the transplant program during the pandemic, we developed a remote monitoring system for transplant recipients.

This system continuously tracks symptoms, blood pressure, weight and laboratory results in the patient's home, reducing the need for hospital attendance by 70% or just 4 visits on average. Patients can also monitor their own data via a bespoke app. Thanks to the support of the HSE community intervention team, we were also able to perform laboratory tests in the home, further reducing the need to attend hospital. We are grateful to the Sláintecare program for its support with this initiative, which has permitted the kidney transplant program to continue through this most challenging period.

Because of the augmented immunosuppression required to transplant 'highly sensitised' recipients, this group of patients were particularly adversely affected by the COVID-19 pandemic. There were 21 patients transplanted with a high level of preformed antibodies, PGen ≥ 85% . There were 14 transplants performed after deceased donor cardiac (DCD) deaths with 3 hospitals referring their first DCD donors reflecting an increasing trend in this donor type. Twenty eight (23%) of our transplants in 2020 were from living kidney donors – a remarkable reflection of the commitment of living donors to the process in the circumstances.

The number of patients alive with a functioning kidney has remained stable. This number reached 2502 at the end of 2020. The number of patients on the transplant waiting list increased during 2020 with 519 listed at the end of 2020, compared to 509 in 2019 and 462 in 2018. In 2020, 152 new patients were added to the transplant waiting list a decrease of 27% on 2019. However, the supply of organs in comparison to the number of patients waiting continues to be the most challenging issue for all transplant programmes, including the NKTS. The median time to transplant from approval to the transplant waiting list was 19 months.

Irish Kidney Transplant outcomes continue to be excellent. The median survival (life expectancy) of allografts for deceased donor kidney transplants is 14.9 years, and we have recorded steady improvements in this number since the 1980s. Based on the most recent data, 1-year Irish kidney transplant outcomes continue to be excellent with 1-year allograft survival for deceased donors 97% and patient survival over 99%.

Twenty eight (23%) of our transplants in 2020 were from living kidney donors – a remarkable reflection of the commitment of living donors to the process in the circumstances

We bench-mark our outcome data against the European Collaborative Transplant Study (CTS) and our outcomes exceed the CTS mean for all groups. Last year, two recipients reached the 40th anniversary of their transplant, bringing to 13 the number of patients who were transplanted in Ireland with a functioning kidney lasting over 40 years.

We performed 28 living donor kidney transplants in 2020. Whilst outcomes for living donor transplants are similar to that for deceased donor transplants in the first year (96% and 100% allograft and patient survival respectively), the benefits of living donor transplantation become apparent in subsequent years. At the 5 year time point, living donor recipients have a 92% allograft survival and 97% patient survival compared to 86% deceased donor allograft survival and 91% patient survival. In addition, patients who received a living kidney donor kidney 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'.

In summary, 2020 has proven to be one of the most challenging years for everyone involved in healthcare provision but especially for patients awaiting a life-changing kidney transplant. We would like to acknowledge the ongoing work and efforts of all the members of the transplant team, the staff of the ICUs throughout the country and all the staff in Beaumont Hospital who have supported us, in this most difficult of years. We would especially like to acknowledge the forbearance of the patients who depend on this transplant programme and the bravery of the living kidney donors. We will continue to strive to provide the best and safest care to all our patients.

Finally, 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 programme and wish to thank all donors and their families for their generosity.

At the 5 year time point, living donor recipients have a 92% allograft survival and 97% patient survival compared to 86% deceased donor allograft survival and 91% patient survival

SECTION 2

Kidney Transplant Activity 2020

- **In 2020, 123 kidney transplants were performed in the Republic of Ireland (ROI). Of these, 28 were from living donors, 95 were from deceased donors.**
- **Overall, there were 30 fewer kidney transplants performed in ROI in 2020 compared to the previous year, reflecting the challenges of transplantation in the face of the COVID-19 pandemic.**
- **The number of recipients living with a functioning kidney remains stable, reaching 2579 (at year end 2020). Of the 2579 currently functioning kidney transplants in our service, 2502 (97%) were transplanted in Beaumont Hospital.**
- **There were 28 living donor kidneys transplanted in 2020 representing a slight increase compared to 2019, but reduced compared to previous years where there was an overall mean of 38 living kidney donor transplants performed over the last 6 years. Living donor transplants represent 23% of all kidney transplants performed; similar to the last 6 years where a total of 24% of all transplants performed were to living donor recipients. The number of deceased donor kidney transplants was 95 for 2020 which includes 3 simultaneous pancreas/kidney (SPK) transplants.**
- **There were 9 paediatric (< 19 yrs) transplants, two of these were from living donors.**
- **There was one paired kidney exchange transplant performed in collaboration with our colleagues in the UK.**

2.1 Summary of kidney transplant activity 2015-2020

Table 2.1: Summary of transplant activity 2015 – 2020

Category	2015	2016	2017	2018	2019	2020	Average for 6 yrs. (rounded)
Total number of transplanted kidneys*	153	172	192	167	153	123	**160**
Number of deceased-donor kidney only transplants	120	122	136	122	126	92	**120**
Number of Living donor kidney transplants	33	50	51	40	25	28	**38**
Number of Simultaneous Pancreas/ Kidney (SPK)	0	0	5	5	2	3	**3**
Number of Paired Kidney Exchange (Living donor UK)	8	7	3	3	3	1	**4**

*Includes SPK and excludes paired kidney exchange (UK).

Table 2.2: Number of functioning kidney transplants at the end of 2020*

Category	0-10 years	> 10-20 years	> 20-30 years	> 30-40 years	> 40 years	Total kidneys
Deceased donor kidney only transplants	**1,067**	**662**	**241**	**53**	**5**	**2,028**
Living donor kidney transplants	318	48	2	27	8	**403**
Simultaneous Pancreas/Kidney (SPK)	33	31	5	0	0	**69**
Kidney/Liver	0	1	1	0	0	**2**
All kidney transplants	1,418	742	249	80	13	**2,502**

*Excludes functioning kidneys transplanted abroad who are under the care of the NKTS.

Figure 2.1: Number of deceased donor kidney transplants per annum 1964 – 2020

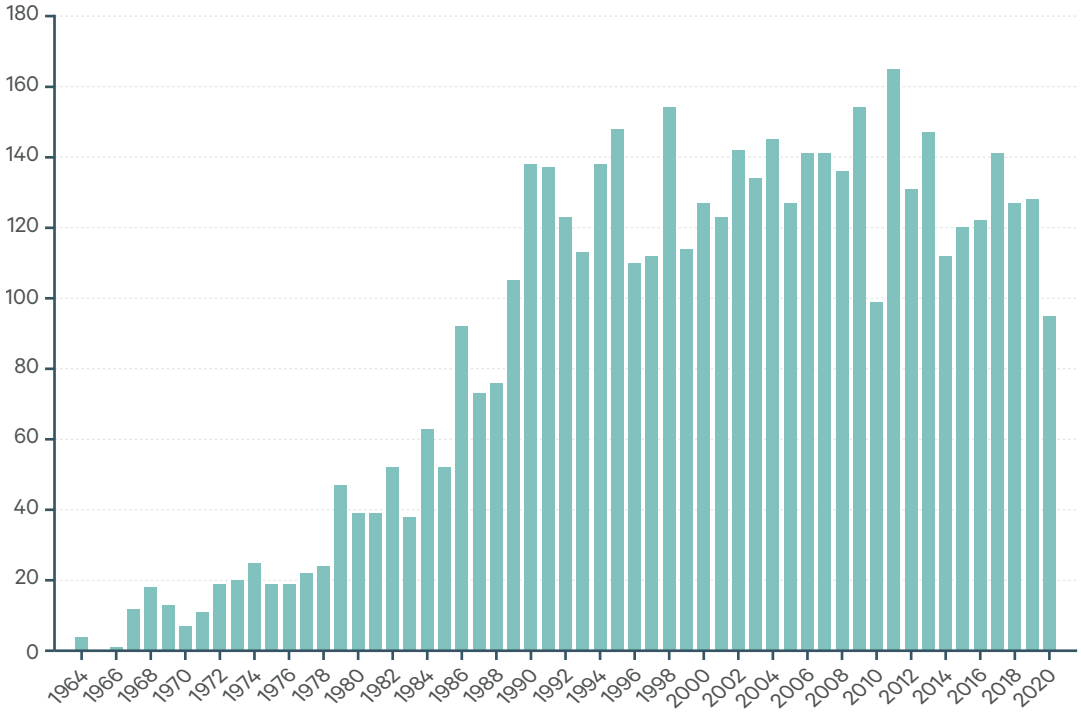


Figure 2.2: Number of living donor kidney transplants per annum 1972 – 2020

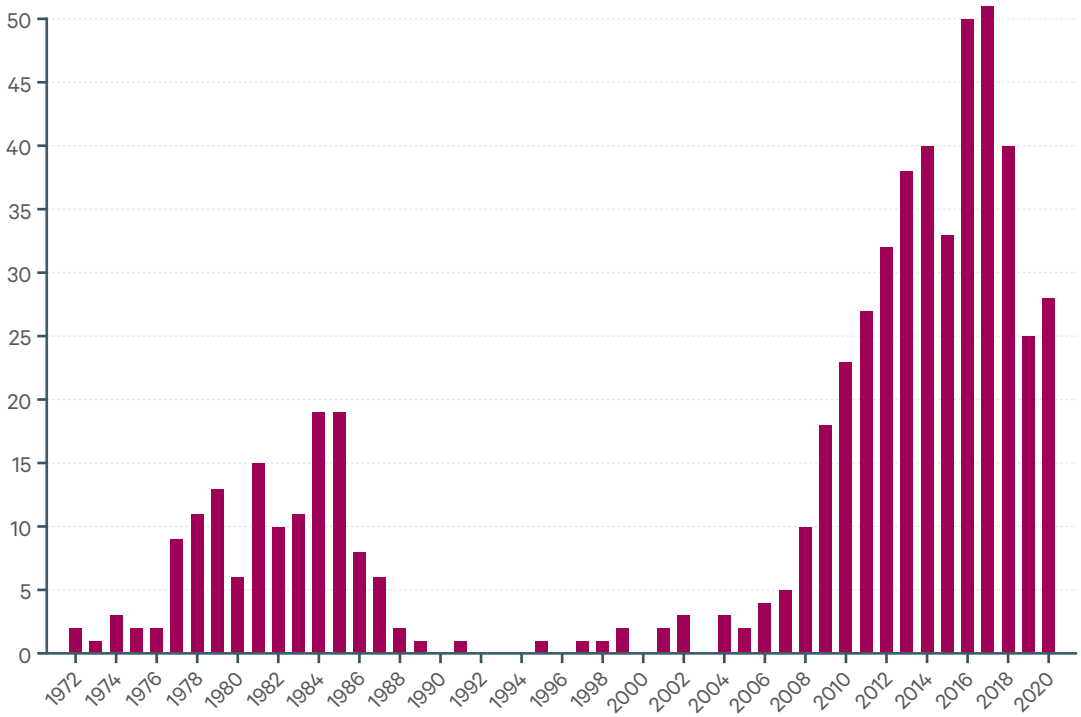


Figure 2.3: Proportion of total deceased & living donor kidney transplants 2003 – 2020

Outcomes and long term survival rates for National Kidney Transplant Service are amongst the highest in Europe

2.2 Immunosuppression protocol 1984-2020

Figure 2.4: Immunosuppression protocol for deceased and living donors 1984 – 2020

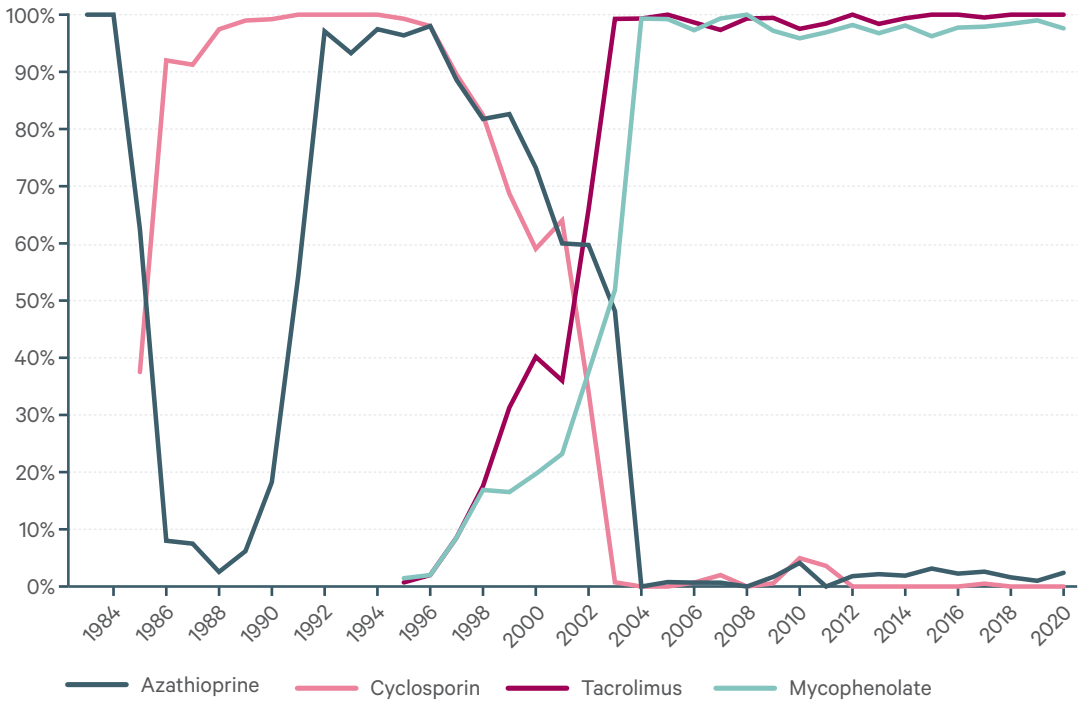
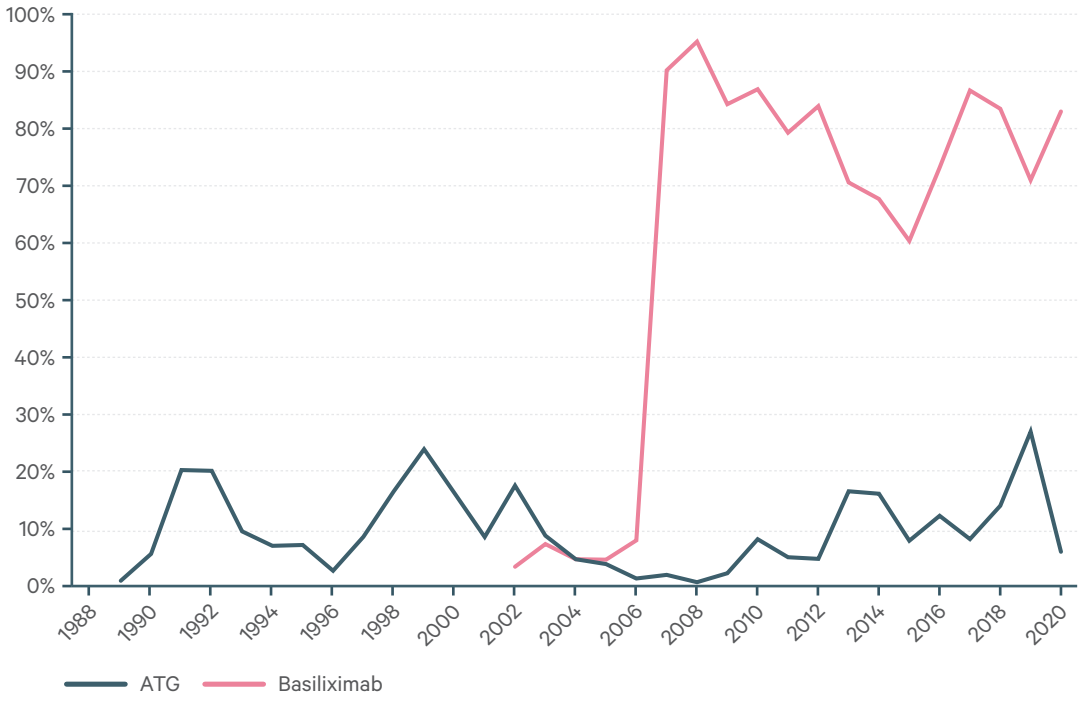


Figure 2.5: Induction therapy for deceased and living donors 1988 – 2020



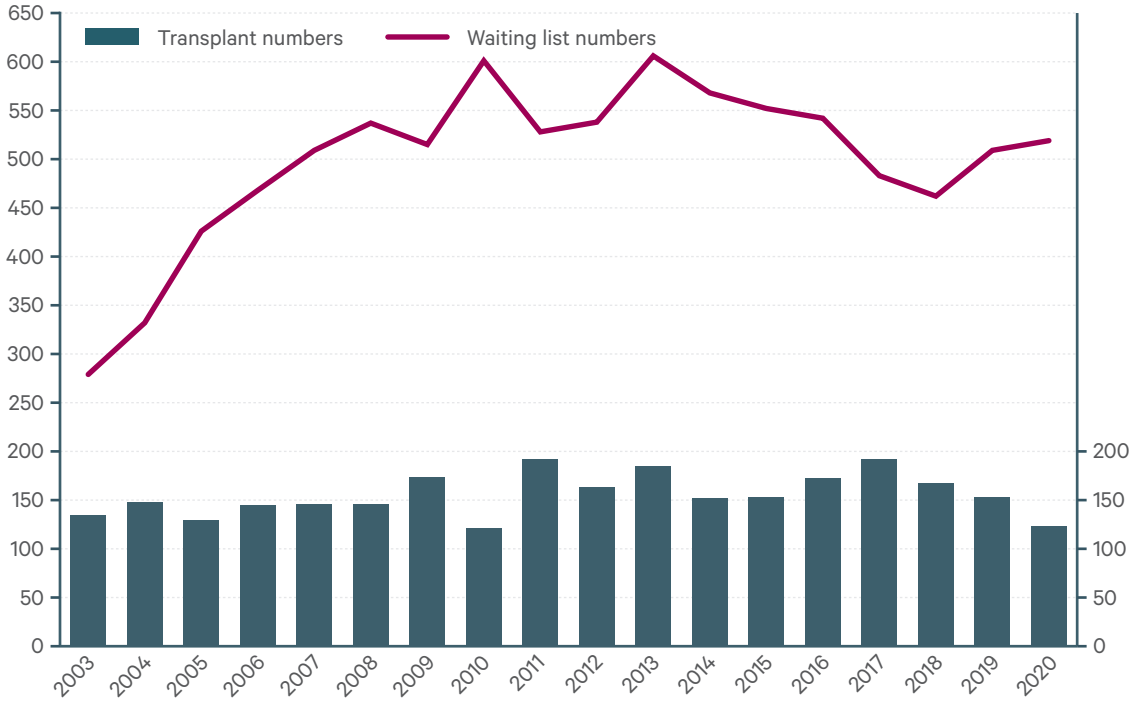
SECTION 3

Kidney Transplant Waiting List

- **At the end of 2020, the number of patients waiting for a kidney transplant had increased to 519 compared to 509 at the end of 2019. The highest number was 2013 when there were 606 patients waiting which decreased year on year until 2019 (Figure 3.1).**
- **The overall median waiting time to transplant in 2020 was 19 months, i.e. of the 123 patients transplanted last year 50% received a kidney transplant before 19 months of being placed on the waiting list, slightly increased from 18 months in 2019. Waiting times for living donor transplants were shorter than for deceased donor transplants, at 16 months and 20 months respectively (Figure 3.2).**
- **Median time on dialysis was 29 months overall, 32 months for deceased donor recipients and 15 months for living donor recipients (Figure 3.3). In 2020 16 (13%) of transplants were performed before patient commenced dialysis (pre-emptively).**

3.1 Number of patients awaiting kidney transplant compared to number of patients transplanted per year

Figure 3.1: Number of patients on the transplant waiting list (active and suspended) and number of kidney transplants per year 2003 – 2020



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

Figure 3.2: Median time on the transplant waiting list prior to first transplant 2003 – 2020

Figure 3.3: Median time on dialysis prior to first transplant 2003 – 2020

3.3 Referring centre for transplant recipients

- **Figure 3.4 represents the breakdown of recipients by referring centre for last six years. Overall for period 2015 – 2020 Beaumont had the largest percentage of referrals, however in 2020 Tallaght/St. James's Hospitals had referred 22 (18%) of all kidney recipients.**

- **Figure 3.5 shows the percent of patients transplanted relative to the number on the transplant waiting pool at the start of the year. For example, there were 8 patients on the transplant waiting list at the start of 2020 from the combined centres of Crumlin/Temple Street Children's hospitals and there were 7 patients transplanted from these centres during 2020 representing a rate of 87.5%.**

Figure 3.4: Percentage of total kidneys transplanted by referring centre for years 2020 separately and overall for years 2015 – 2020

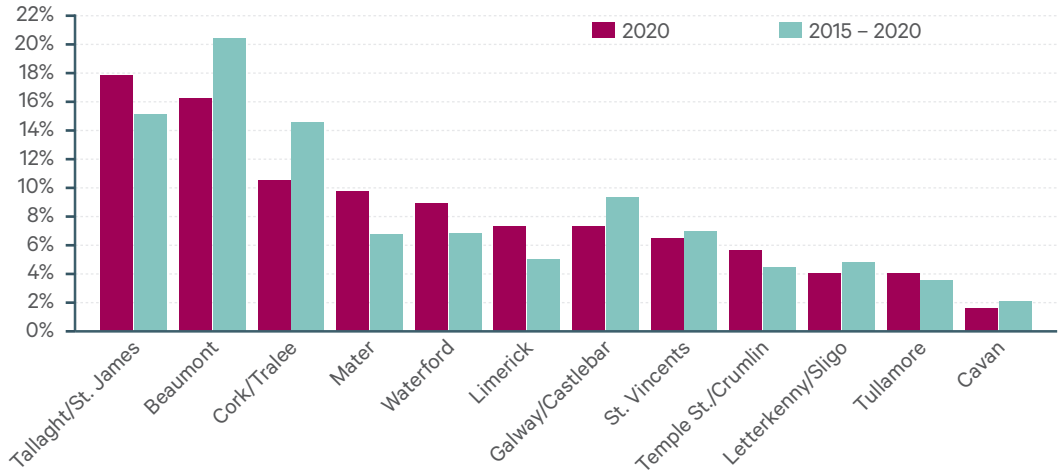
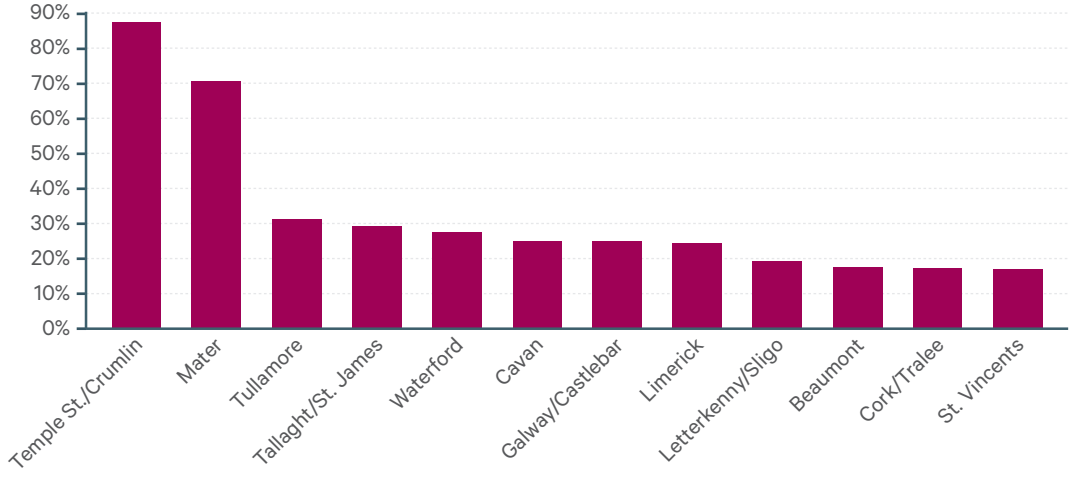


Figure 3.5: Percent of patients transplanted in 2020 relative to number on the kidney transplant waiting list at the start of 2020 by transplant centre



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 a low of 40 years in 2004 to 53 years in 2017 (Figure 4.1). During 2020, the median age for deceased donor recipients declined slightly to 47 years with a range of 6 to 75.**

- **During 2020, the median recipient age of living donor transplant was 42 years, range (6 – 70 years), close to the overall median age of 40 years for the period 2007 – 2020 (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 constant over time with approximately two thirds of transplants being male recipients, which reflects the sex distribution on the transplant waiting list. During 2020, there was a reduced percentage of male recipients (59%) compared to the period as a whole (Figure 4.3).**

- **Renal replacement modalities prior to transplantation for 2020 were similar to previous years. The percentage of pre-emptive transplants at 13% also reflects overall rates for the time period 2003 – 2020 (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. There has been a steady increase in the number of such 'highly sensitised' patients transplanted in recent years with 17% of all transplants performed in 2020 to patients with PRA ≥ 85%, a reduction from 2019 (Figure 4.6). This cohort of patients remains challenging to transplant especially in balancing the risks of exposing patients to augmented immunosuppression regimes with the attendant risks, during the COVID-19 pandemic.**

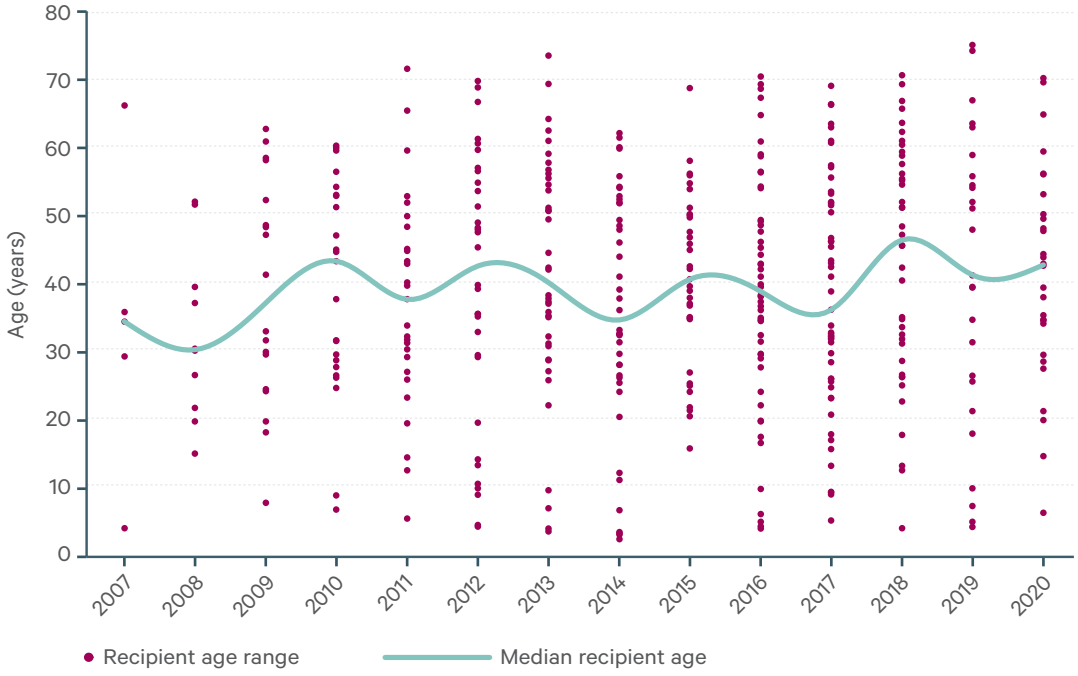
- **Median donor age for deceased donor recipients was 44 years (11 – 69 years) in 2020 (Figure 4.7). This represents a reduction from the highest median donor age in 2019 at 52 years. Median donor age for living donors has remained relatively constant in recent years and was 42 years (range 29 – 68 years) in 2020 compared to 45 years for the period, as a whole (Figure 4.8).**

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

4.1 Recipient age

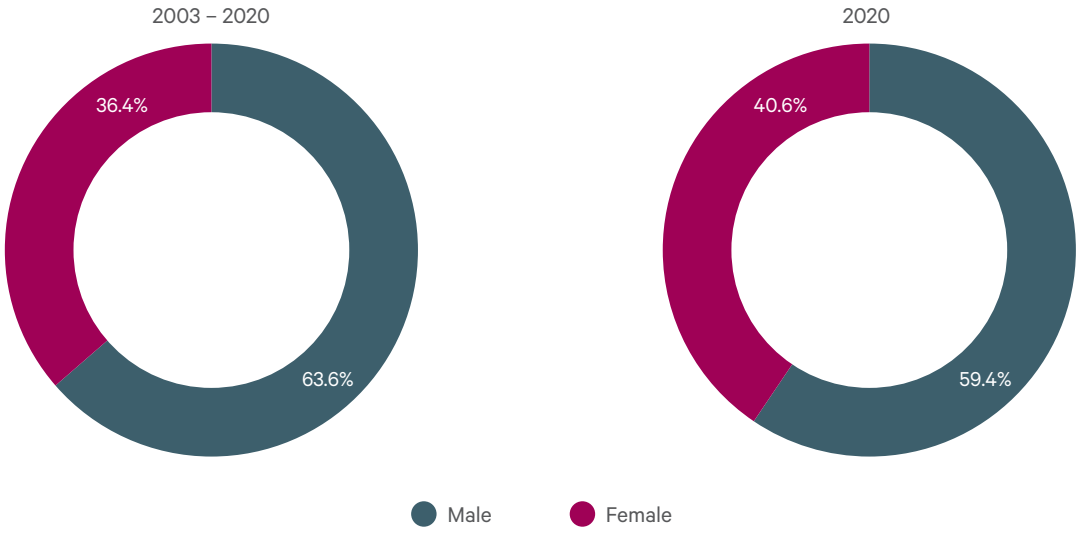
Figure 4.1: Recipient age at transplant for deceased donor kidneys 2003 – 2020

Figure 4.2: Recipient age at transplant for living donor kidneys 2007 – 2020



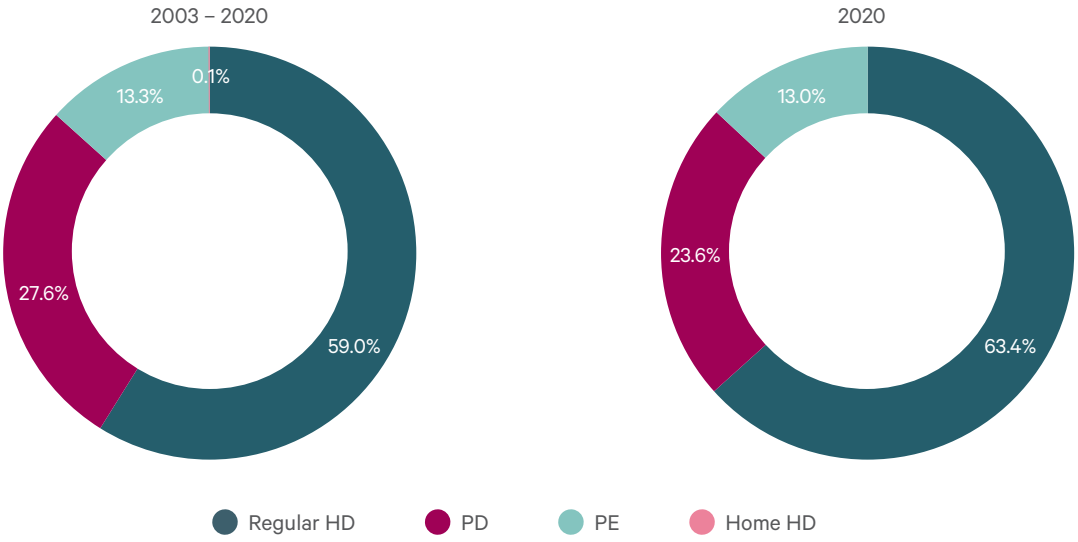
4.2 Recipient sex

Figure 4.3: Sex of recipient for combined deceased and living donor kidney transplants 2003 – 2020



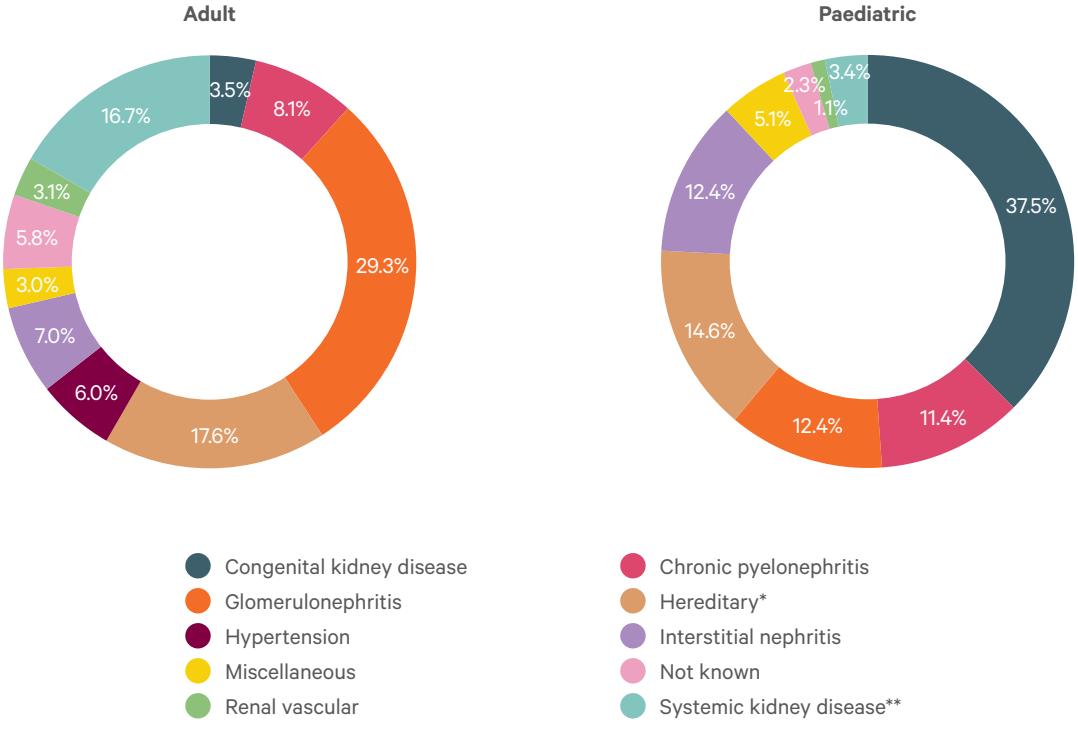
4.3 Mode of renal replacement therapy prior to transplantation

Figure 4.4: Mode renal replacement prior to first kidney transplant, 2003 – 2020



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

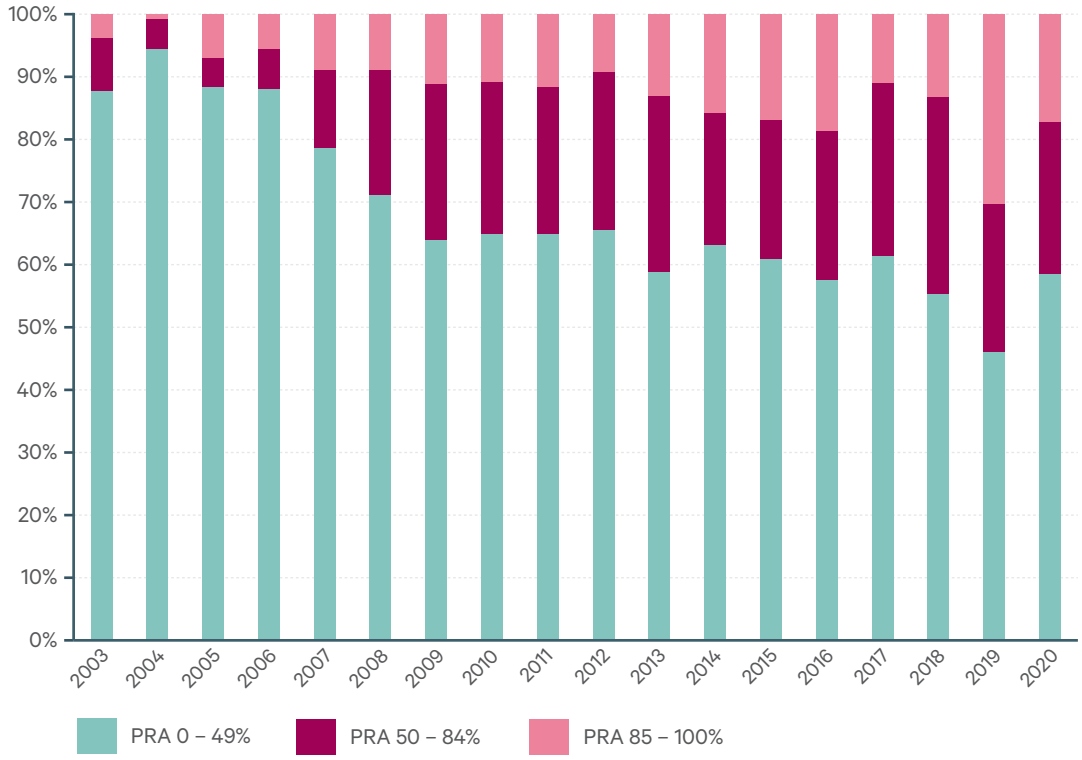
Figure 4.5: Cause of end stage renal disease for adult and paediatric transplant recipients 2003 – 2020



*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 for all transplants 2003 – 2020



17% of all transplants were to highly sensitised recipients

4.6 Donor age

Figure 4.7: Donor age for deceased donor kidney transplants 2003 – 2020

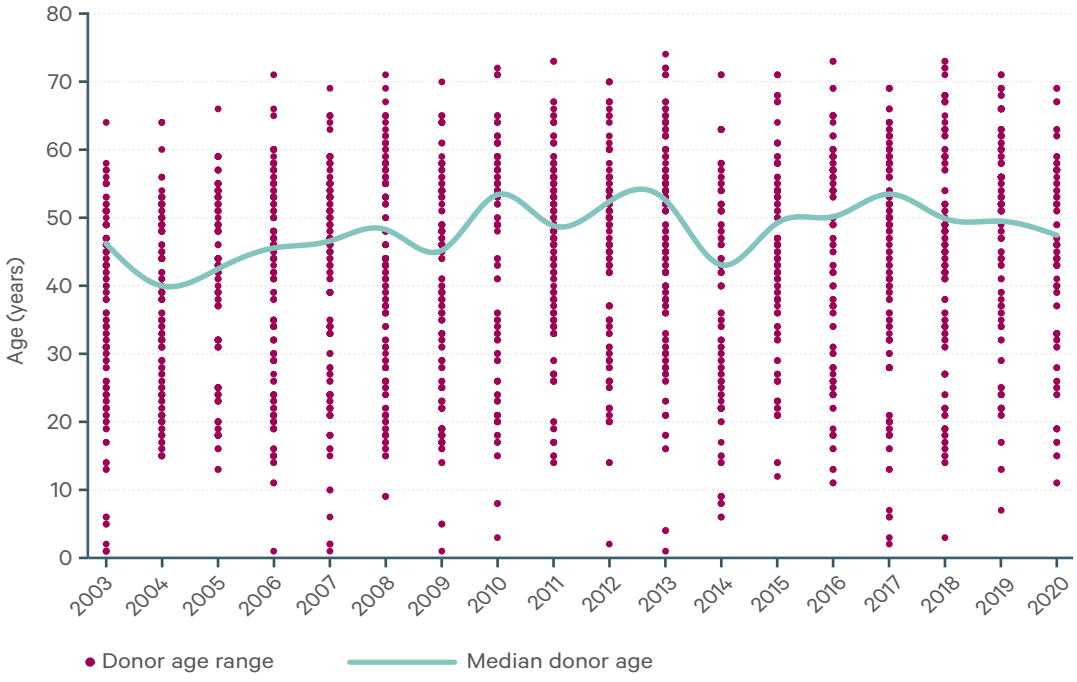
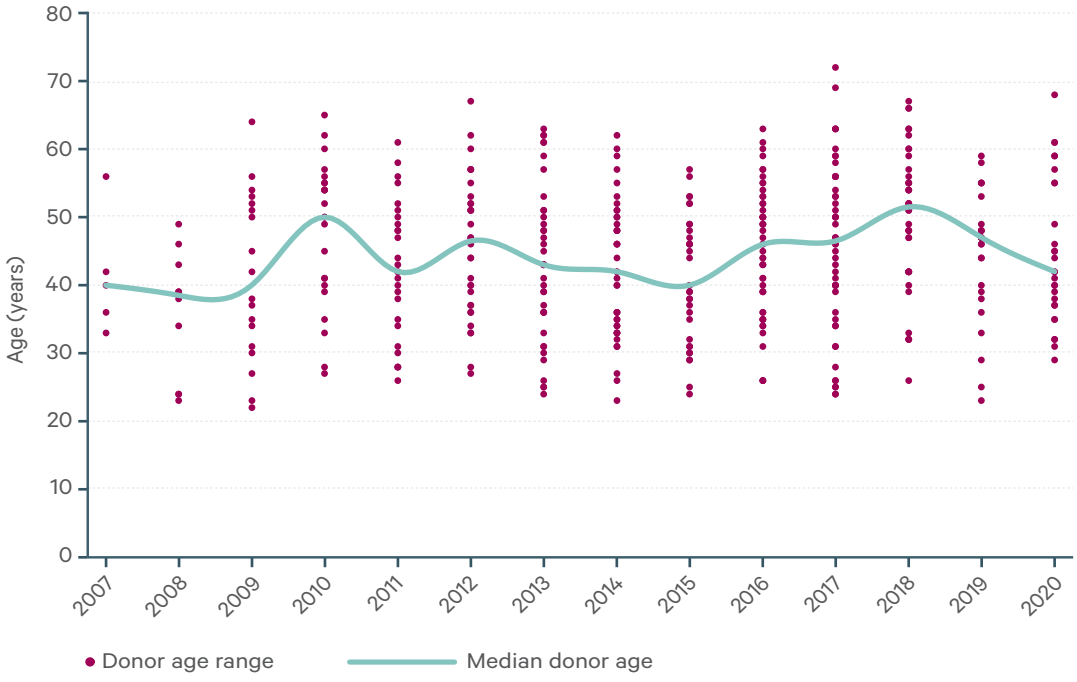


Figure 4.8: Donor age for living donor kidney transplants 2007 – 2020



4.7 Donor sex

Figure 4.9: Donor sex for deceased donor kidney transplants 2003 – 2020

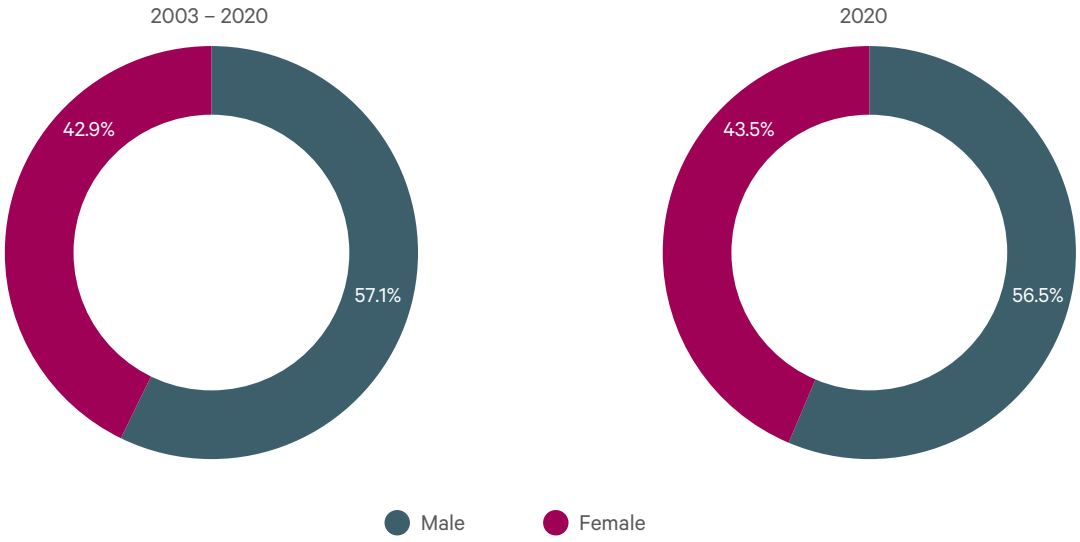
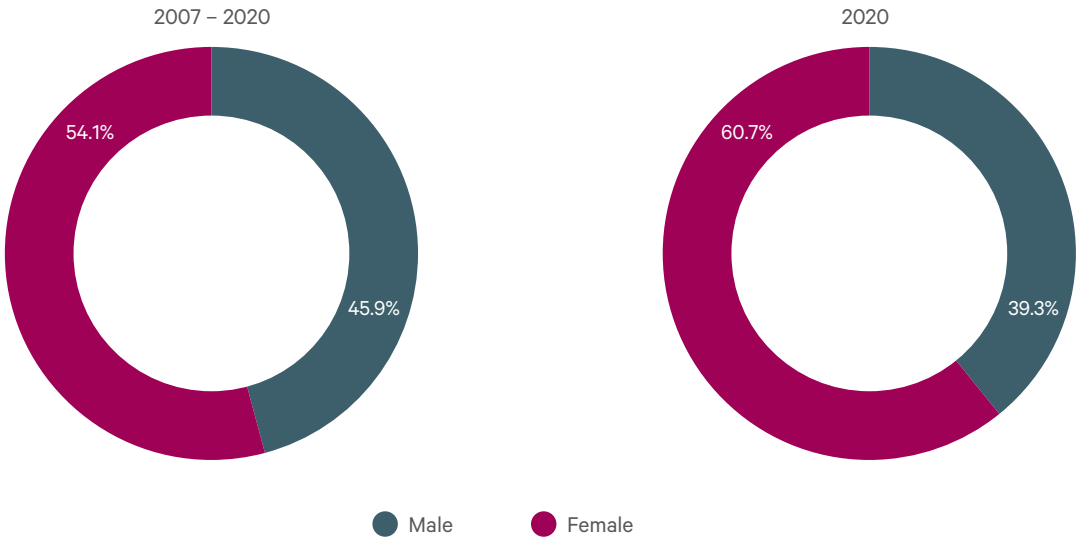


Figure 4.10: Donor sex for living donor kidney transplants 2007 – 2020



Main cause of ESRD in adults is glomerulo-nephritis while in children it is congenital disease

4.8 Deceased donor offers not converted to transplantation

Based on the information received from the donor co-ordinators in Organ Donation and Transplant Ireland (ODTI), each donor is carefully evaluated in order to estimate the likely outcome of the transplant and the risks to the potential transplant recipient. In order to arrive at the decision to proceed to transplant, the consultant surgeon follows the guidelines provided by the Council of Europe 'Guide to the quality and safety of organs for transplantation', the European Society of Transplantation and the British Transplant Society Guidelines. Clearly, this is a clinical decision based on a judgment as to whether the kidney transplant is predicted to give a successful, durable outcome to the recipient while balancing the risks such as transmission of malignancy or infection to the potential recipients. When a decision to proceed with a transplant is made, the primary nephrologist of the potential transplant recipient is contacted to confirm that they too are in agreement with the decision to proceed to transplant.

In 2020, the NKTS received a total of 43 potential donor referrals from the ODTI that were not converted to transplantation. The NKTS operates a 'two consultant surgeon turn-down' policy, meaning that if a donor is deemed not suitable to proceed, the consultant surgeon discusses the decision with another consultant transplant surgeon before declining the donor. Each decision is then reviewed quarterly by a multi-disciplinary team to reevaluate the declined donor decisions.

The decision not to proceed to transplantation for the 43 donors declined is summarised as follows:

Table 4.1: Summary of reasons donor offers from ODTI declined

Reasons donor declined	Number
Donor declined due to risk of COVID-19 infection	**13**
Donor declined due to identified co-morbidity predicted to negatively impact kidney transplant outcome	**12**
Donor declined due to risk of transmission of malignancy	**4**
Donor declined due to risk of transmission of infection	**12**
Donor family withdrew consent	**2**

Of the 12 donors declined due to the risk of infection, 5 were either known to be hepatitis C or hepatitis B positive, or to have lifestyle attributes making them high risk for viral infections such as HIV or hepatitis C or B or syphilis. With advances in the screening for and treatment of these infections, it is now possible to safely transplant organs from such 'lifestyle-risk' donors, as occurs in other transplant centres. In fact, because of the younger age profile of such donors, kidney transplant outcomes are typically excellent, complication rates, including rates of acquired infection, are low. International utilisation of organs from lifestyle risk donors has thus steadily increased in recent years. In response to this changing landscape, this year the NKTS has recently developed a roadmap to increase the utilisation of lifestyle-risk donors, in collaboration with experts in virology and infectious diseases. A revised consent process for recipients has been instituted, including supporting videos and patient information. Recipients will now be specifically consented regarding the risks of contracting syphilis, HIV, Hepatitis B or C if offered a kidney from a 'lifestyle-risk donor', and in the event they should contract these infections post transplant, will be treated accordingly. It is our expectation that the utilisation of organs from such 'lifestyle risk' donors will increase on foot of these initiatives.

SECTION 5

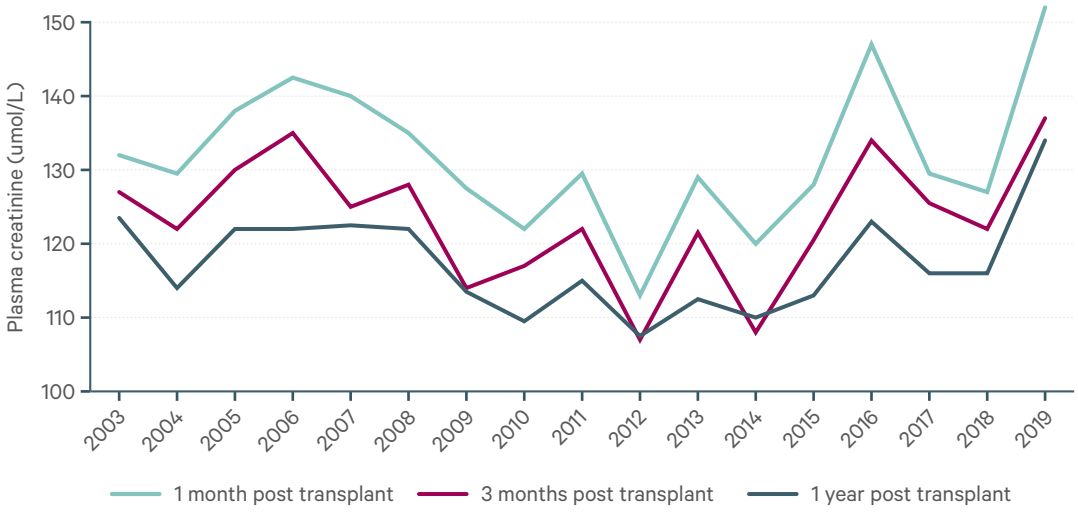
Recipient Outcomes

- **The overall median allograft survival for adult deceased donors in the past 25 years is 14.9 years, with steady improvements in outcomes over time (Table 5.1).**
- **Outcomes for first and second allograft are almost identical between 1995 and 2019 with median allograft survivals for first and second deceased donor adult allografts of 14.8 and 15.3 years respectively. Third and fourth allografts reported median allograft survival were11.3 and 6.1 years respectively (Table 5.3).**
- **Survival of allograft at one-year for deceased donor adult kidney recipients for 2015 – 2019 was 97.2%. Five-year allograft survival remains stable at 86.1% for 2010 – 2014 slightly below the previous time period (2005 – 2009) of 87.8%. These results compare very favorably with the earliest period 1995 – 1999 where 5 year allograft survival was 71.8% (Table 5.5).**
- **Median patient survival for adult deceased donors between 1995 – 2019 was 21.9 years (Table 5.6).**
- **Patient survival at 1 year remained stable for the three most recent eras and was at a high of nearly 98.8% for the period between 2015 – 2019. Five year survival rates improved markedly going from 85.2% in the initial period to 91.2% for 2010 – 2014 (Table 5.8).**
- **The rate of delayed allograft function (defined as the temporary requirement of dialysis within one week of transplant) for deceased donor kidneys was very high in 2019 at 39% and 12% for living donor recipients (Figure 5.12), but reduced to 26% and 4% respectively for 2020.**
- **Instances of acute rejection, defined as either biopsy proven TCMR (T-cell mediated rejection) or ABMR (antibody mediated rejection) within the first year of transplantation have been relatively stable over the last decade with average 10% per year. The rate for 2019 was below average at 7.2% (Figure 5.13).**

5.1 Deceased donor outcomes

5.1.1 Renal function at 1 month, 3 months and 12 months post-transplant of surviving allografts

Figure 5.1: Median plasma creatinine post transplant 2003 – 2019



5.1.2 Adult deceased donor kidney only allograft long term outcomes

5.1.2.1 Overall adult deceased donor allograft outcomes

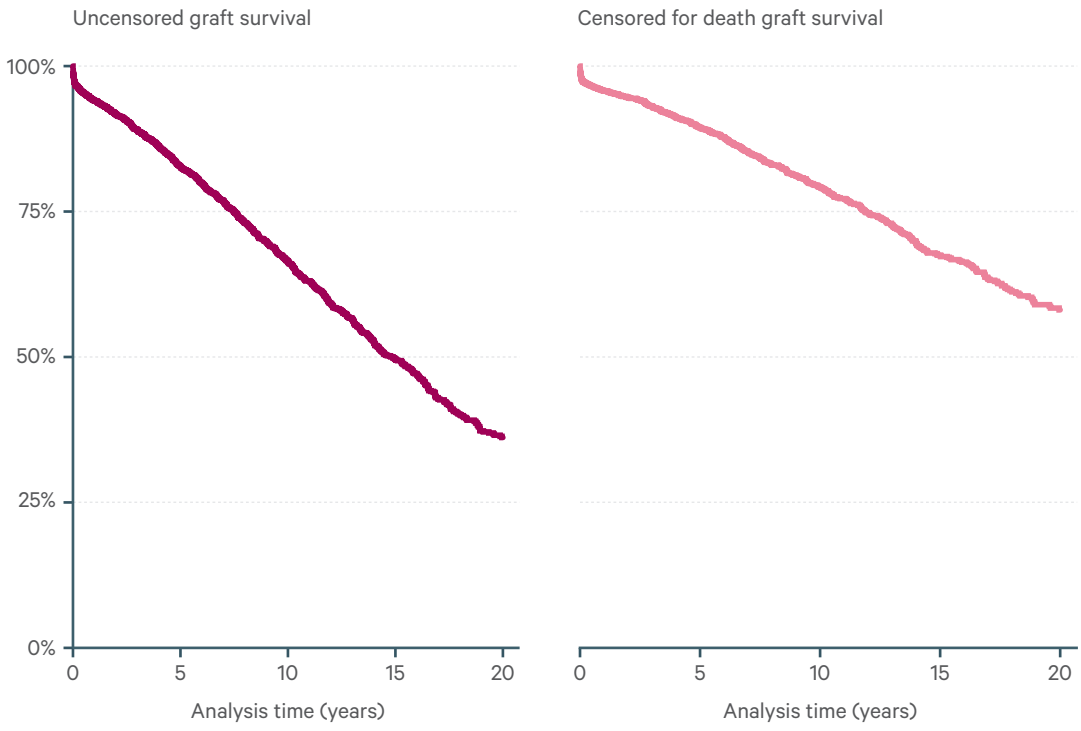
Table 5.1: Overall median adult deceased donor allograft survival 1995 – 2019

No of transplants	Median allograft survival in years [95% C.I.] Uncensored for death
2,955	14.9 [14.0 – 15.8]

Table 5.2: Adult deceased donor allograft survival 1995 – 2019

Follow up time (years)	Estimated allograft survival [95% C.I.] Uncensored for death	Estimated allograft survival [95% C.I.] Censored for death
1	94.07 [93.16 – 94.87]	95.66 [94.85 – 96.34]
5	82.75 [81.26 – 84.13]	89.21 [87.95 – 90.34]
10	66.49 [64.48 – 68.41]	78.22 [76.89 – 80.43]
15	49.65 [47.25 – 52.01]	66.80 [64.31 – 69.16]
20	36.16 [33.30 – 39.02]	57.17 [53.79 – 60.40]

Figure 5.2: Adult deceased donor kidney allograft survival 1995 – 2019



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 1995 – 2019*

Transplant number	No of patients	Median allograft survival (years) [95% C.I.]	
1	2,527	14.8	[14.0 – 15.8]
2	369	15.3	[13.7 – 18.0]
3	50	11.3	[7.7 – 16.5]
4	8	6.1	[0.09 – 15.8]

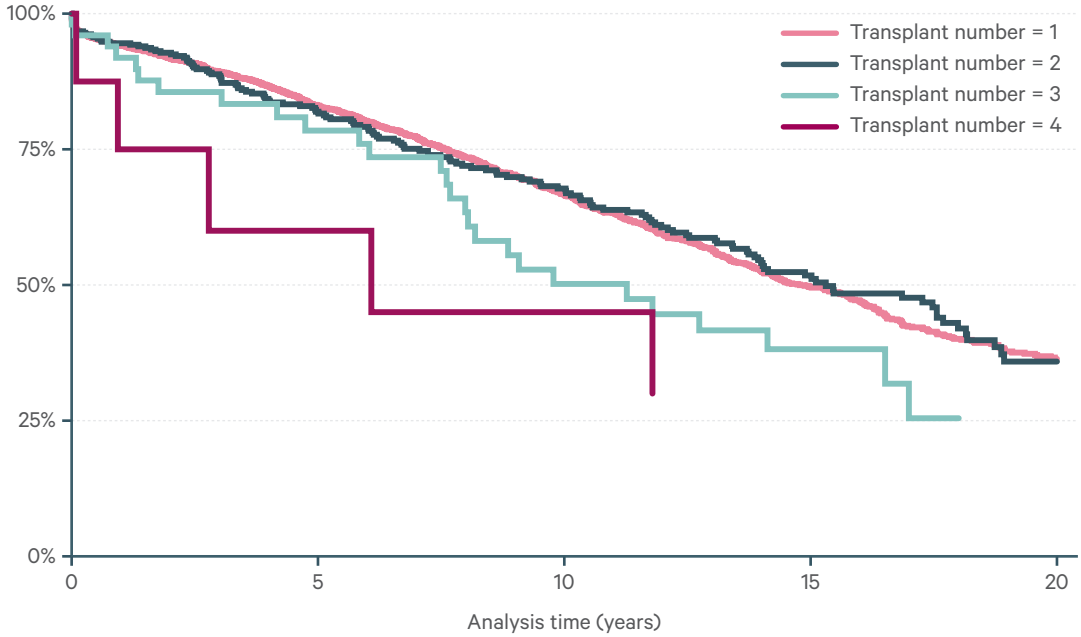
*One recipient with a 5th transplant not included.

Table 5.4: Deceased donor adult allograft survival 1995 – 2019 by transplant number

Transplant number	Follow up time (years)	Estimated percent allograft survival [95% C.I.]	
1	1	94.1	[93.1 – 95.0]
1	5	83.1	[81.4 – 84.5]
1	10	66.7	[64.6 – 68.8]
1	15	49.6	[47.0 – 52.2]
1	20	36.4	[33.3 – 39.5]
2	1	94.6	[91.7 – 96.5]
2	5	81.9	[77.3 – 85.7]
2	10	67.8	[62.0 – 72.9]
2	15	51.8	[45.2 – 57.9]
2	20	35.9	[28.0 – 43.8]
3	1	91.9	[79.8 – 96.9]
3	5	78.5	[63.5 – 87.8]
3	10	50.2	[34.1 – 64.3]
3	15	38.2	[22.9 – 53.3]
3	20	25.5	[10.2 – 44.0]
4	1	75.0	[31.5 – 93.1]
4	5	60.0	[19.6 – 85.2]
4	10	45.0	[10.8 – 75.1]
4	15	30.0	[04.4 – 62.8]
4	20	30.0	[04.4 – 62.8]

Median adult first allograft survival of over 14 years

Figure 5.3: Adult deceased donor first and repeat transplants allograft survival estimates 1995 – 2019

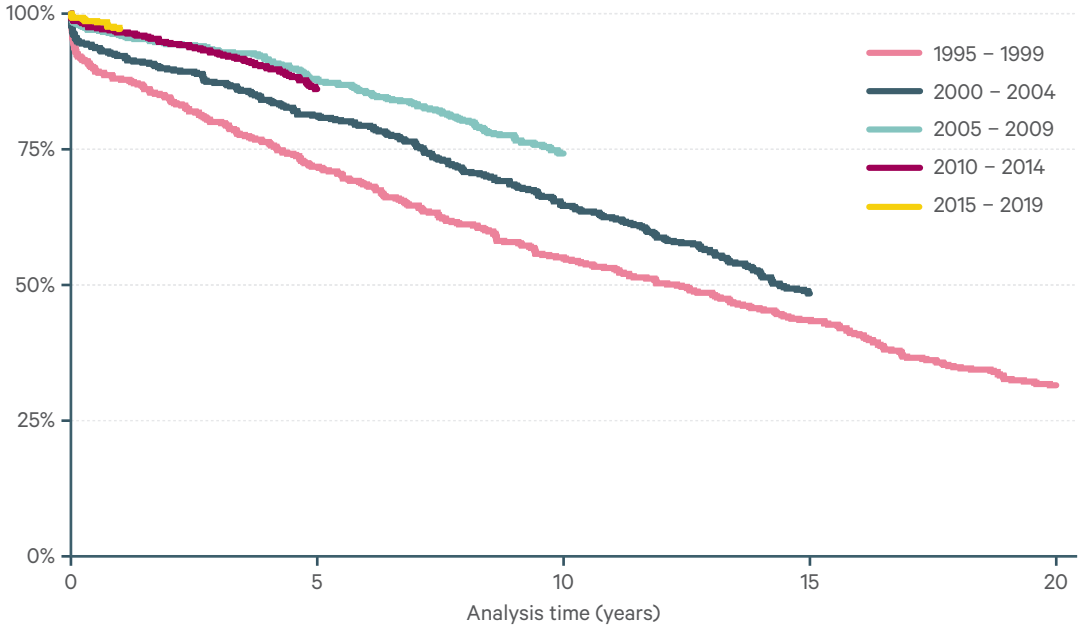


5.1.2.3 Adult uncensored deceased donor first allograft outcomes by era

Table 5.5: Adult first deceased donor allograft survival by era 1995 – 2019

Period transplanted	Follow up time (years)	Estimated allograft survival [95% C.I.]
1995 – 1999	1	88.0 [84.7 – 90.6]
1995 – 1999	5	71.8 [67.5 – 75.6]
1995 – 1999	10	55.1 [50.4 – 59.5]
1995 – 1999	15	43.6 [39.0 – 48.0]
1995 – 1999	20	31.5 [27.3 – 35.8]
2000 – 2004	1	92.2 [89.4 – 94.3]
2000 – 2004	5	81.2 [77.4 – 84.4]
2000 – 2004	10	64.6 [60.1 – 68.7]
2000 – 2004	15	48.4 [43.9 – 52.8]
2005 – 2009	1	96.1 [94.0 – 97.4]
2005 – 2009	5	87.8 [84.7 – 90.3]
2005 – 2009	10	74.2 [70.3 – 77.8]
2005 – 2009	15	
2010 – 2014	1	96.5 [94.5 – 97.8]
2010 – 2014	5	86.1 [82.8 – 88.8]
2010 – 2014	10	
2010 – 2014	15	
2015 – 2019	1	97.2 [95.3– 98.3]
2015 – 2019	5	
2015 – 2019	10	
2015 – 2019	15	

Figure 5.4: Adult first deceased donor allograft survival by era 1995 – 2019



5.1.2.4 Overall adult deceased donor patient survival

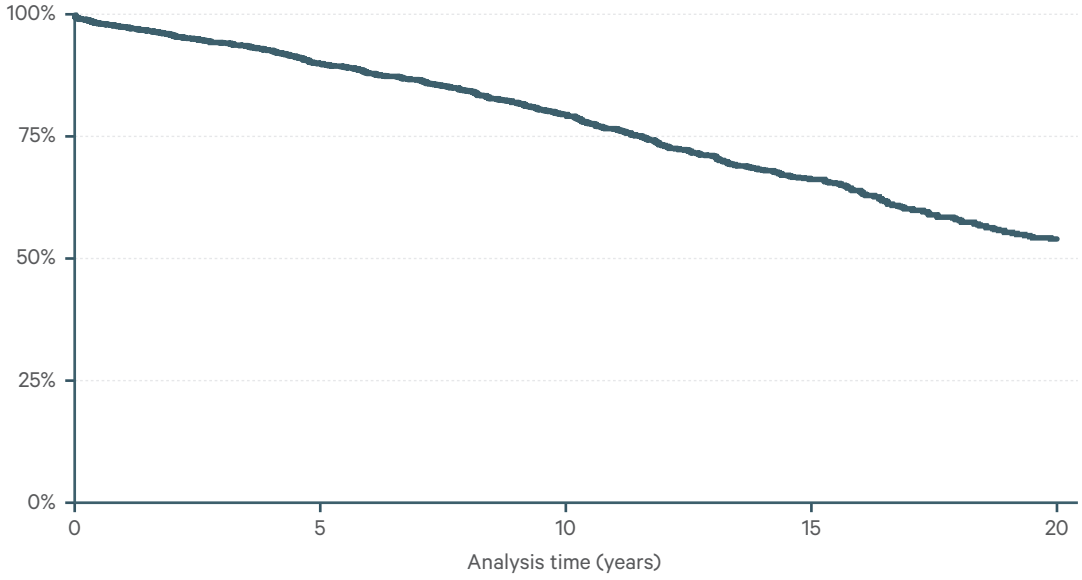
Table 5.6: Overall median adult deceased donor patient survival 1995 – 2019

No of transplants	Median patient survival (years) [95% C.I.]	
2,528	21.9	[20.6 – 24.0]

Table 5.7: Estimated adult deceased donor patient survival 1995 – 2019

Follow up time (years)	Estimated patient survival [95% C.I.]	
1	97.6	[96.9 – 98.1]
5	90.1	[88.8 – 91.2]
10	79.6	[77.7 – 81.4]
15	66.3	[63.8 – 68.7]
20	54.1	[50.9 – 57.2]

Figure 5.5: Kaplan-Meier adult deceased donor patient survival estimates 1995 – 2019

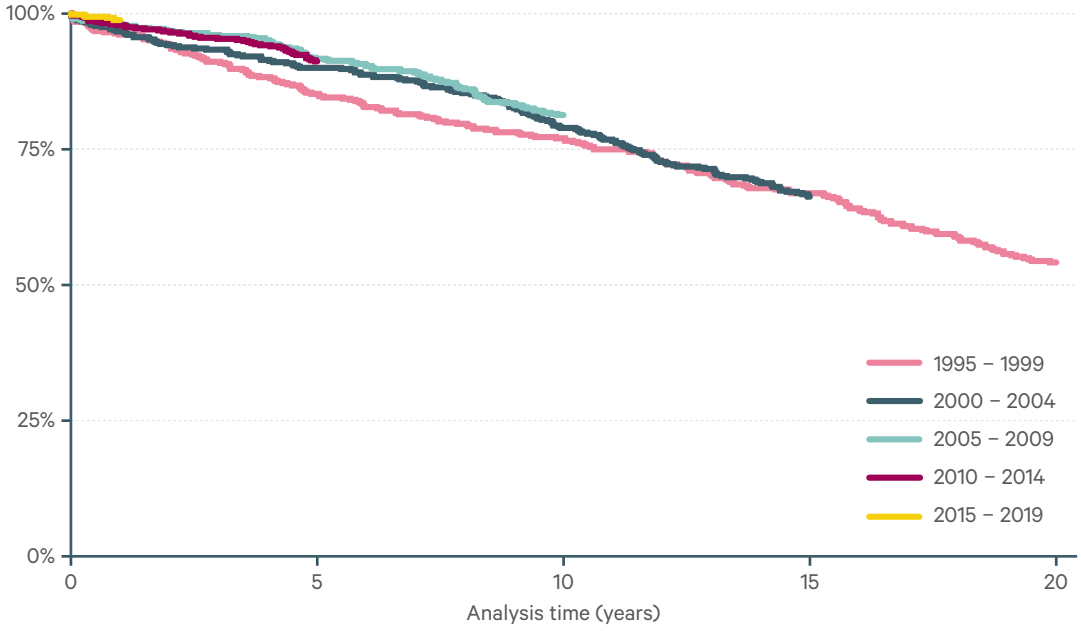


5.1.2.5 Overall adult deceased donor patient survival by era

Table 5.8: Adult first deceased donor patient survival by era transplanted 1995 – 2019

Period transplanted	Follow up time (years)	Estimated patient survival [95% C.I.]
1995 – 1999	1	96.1 [93.9 – 97.5]
1995 – 1999	5	85.2 [81.6 – 88.1]
1995 – 1999	10	77.0 [72.9 – 80.6]
1995 – 1999	15	66.9 [62.3 – 71.1]
1995 – 1999	20	54.2 [49.4 – 58.7]
2000 – 2004	1	96.7 [94.7 – 98.0]
2000 – 2004	5	90.0 [87.0 – 92.4]
2000 – 2004	10	78.9 [75.0 – 82.3]
2000 – 2004	15	66.3 [61.8 – 70.4]
2000 – 2004	20	
2005 – 2009	1	98.1 [96.5 – 99.0]
2005 – 2009	5	91.7 [89.0 – 93.7]
2005 – 2009	10	81.3 [77.7 – 84.4]
2005 – 2009	15	
2005 – 2009	20	
2010 – 2014	1	97.9 [96.2 – 98.8]
2010 – 2014	5	91.2 [88.4 – 93.4]
2010 – 2014	10	
2010 – 2014	15	
2010 – 2014	20	
2015 – 2019	1	98.8 [97.4 – 99.5]
2015 – 2019	5	
2015 – 2019	10	
2015 – 2019	15	
2015 – 2019	20	

Figure 5.6: Adult first deceased donor patient survival by era transplanted 1995 – 2019



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 1995 – 2019

No of transplants	Median allograft survival (years) [95% C.I.]	
185	16.2	[13.1 – 21.1]

Table 5.10: Paediatric deceased donor allograft and patient survival 1995 – 2019

Follow up time (years)	Estimated ***allograft*** survival [95% C.I.]		Estimated ***patient*** survival [95% C.I.]	
1	93.0	[88.2 – 95.9]	98.8	[95.3 – 99.7]
5	82.1	[75.6 – 87.0]	98.1	[94.3 – 99.4]
10	70.4	[62.6 – 76.8]	98.1	[94.3 – 99.4]
15	52.8	[43.8 – 61.1]	93.0	[86.1 – 96.5]
20	41.5	[31.9 – 50.8]	83.5	[72.8 – 90.2]

Figure 5.7: Paediatric deceased donor allograft survival 1995 – 2019

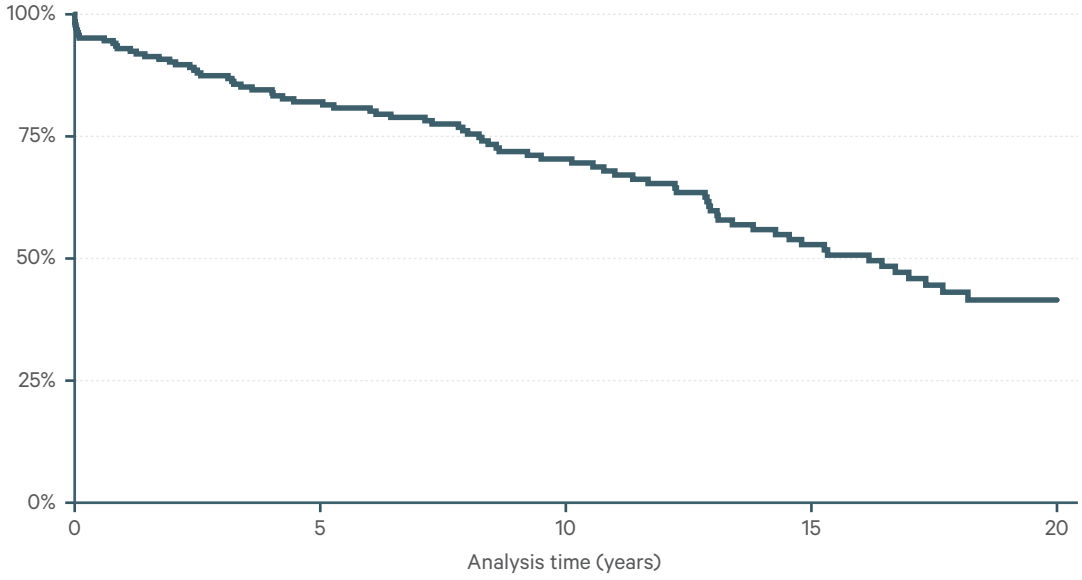
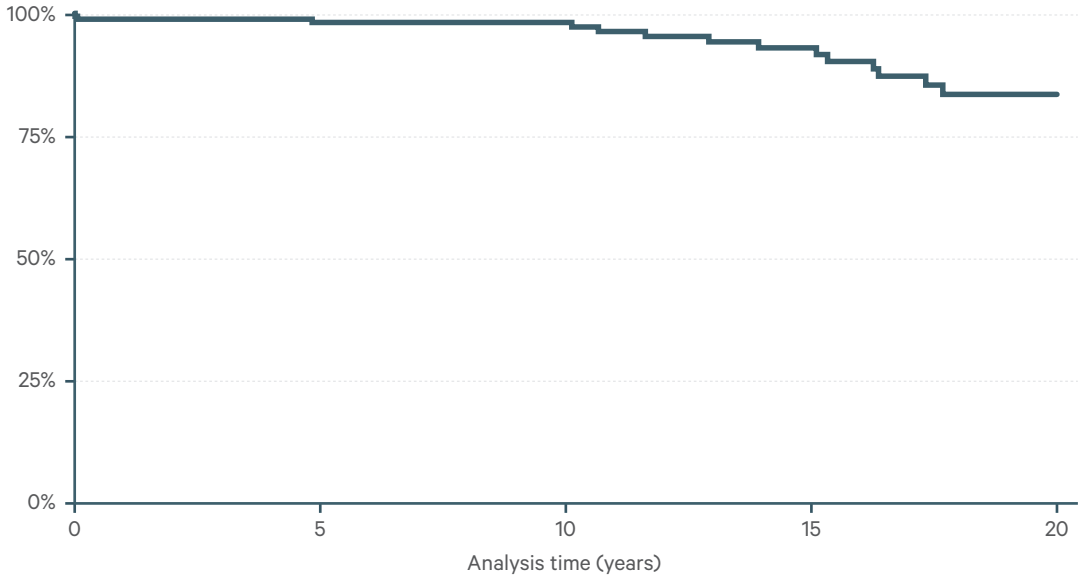


Figure 5.8: Paediatric deceased donor patient survival 1995 – 2019



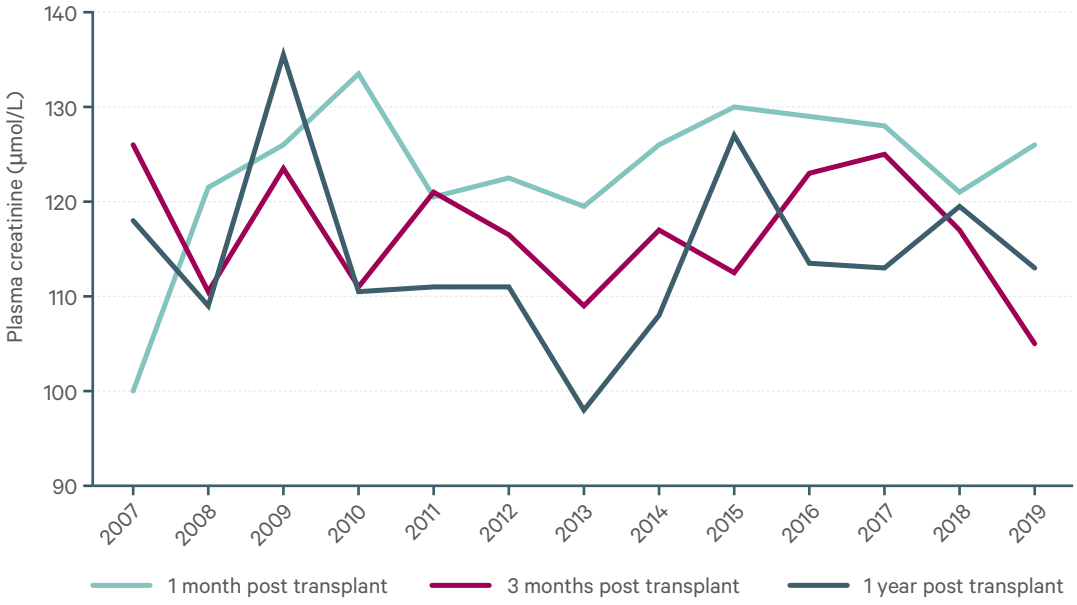
Adult and paediatric living donor allograft 5 year survival is over 92% and patient survival is over 97%

5.2 Living donor outcomes

- **One-year allograft survival for adult living donor transplant recipients was 96.3%, and patient survival was 100%. Similar one-year allograft results were observed for paediatric recipients. Five-year allograft survival for adult living donor transplant recipients between 2007 and 2019 was 92.5% and patient survival was 97.4%. For paediatric recipients 5 year allograft and patient survival was 92.6% and 97.1% respectively (Table 5.11).**

5.2.1 Renal function at 1 month, 3 months and 12 months post-transplant of surviving allografts

Figure 5.9: Median plasma creatinine post transplant 2007 – 2019



Adult living donor patient survival at 10 years is 92%

5.2.2 Long term outcomes for living donor kidney transplants

Table 5.11: Adult and paediatric living donor allograft and patient survival 2007 – 2019

	Allograft survival (first kidneys)				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	96.3	[93.3 – 98.0]	95.5	[83.0–98.8]	100	[-----]	100	[-----]
3	95.0	[91.4 – 97.1]	92.6	[78.5–97.6]	99.1	[96.5 – 99.8]	97.1	[81.4 – 99.6]
5	92.5	[88.0 – 95.3]	92.6	[78.5–97.6]	97.4	[93.9 – 98.9]	97.1	[81.4 – 99.6]
10	80.5	[69.1 – 88.0]	64.7	[26.6–86.7]	91.9	[82.0 – 96.5]	97.1	[81.4 – 99.6]

Figure 5.10: Allograft survival for first adult and paediatric living donor kidney transplants 2007 – 2019

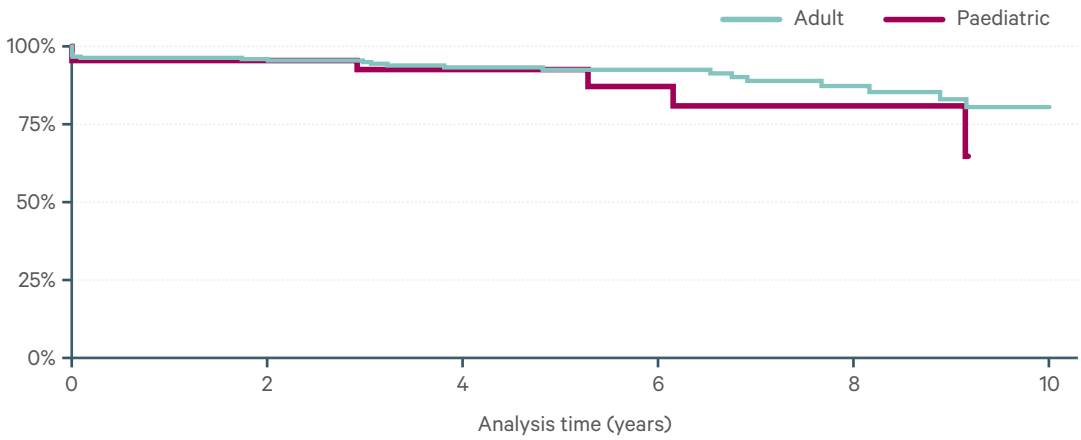
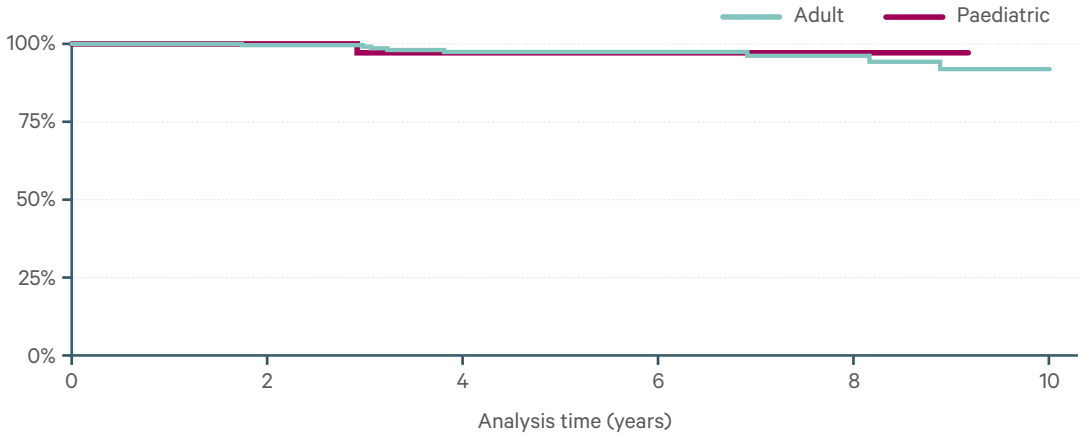


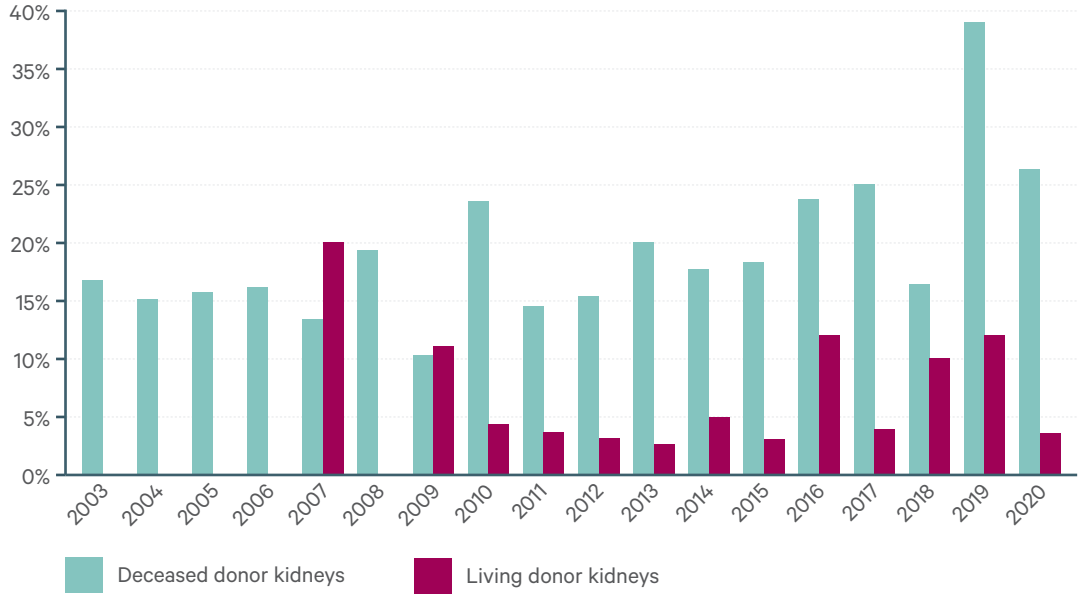
Figure 5.11: Patient survival for adult and paediatric living donor kidney transplants 2007 – 2019



5.3 Adverse outcomes

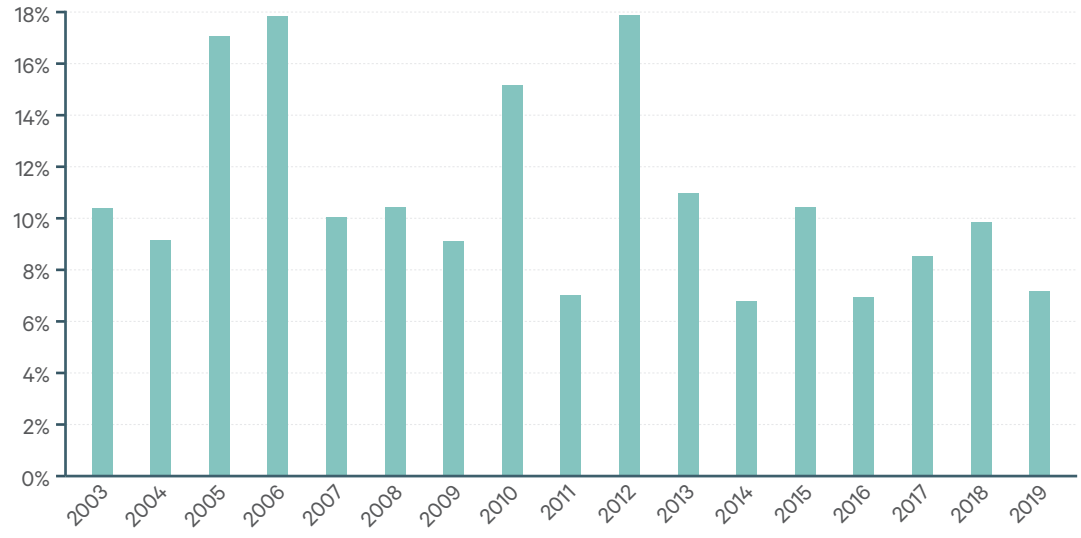
5.3.1 Delayed allograft function

Figure 5.12: Delayed allograft function percentage post transplant 2003 – 2020



5.3.2 Biopsy proven TCMR (T-cell mediated rejection) or ABMR (antibody mediated rejection) rejection

Figure 5.13: Acute rejection rate post transplant 2003 – 2019



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 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
First deceased donor kidney transplants, adults 1989 – 2018

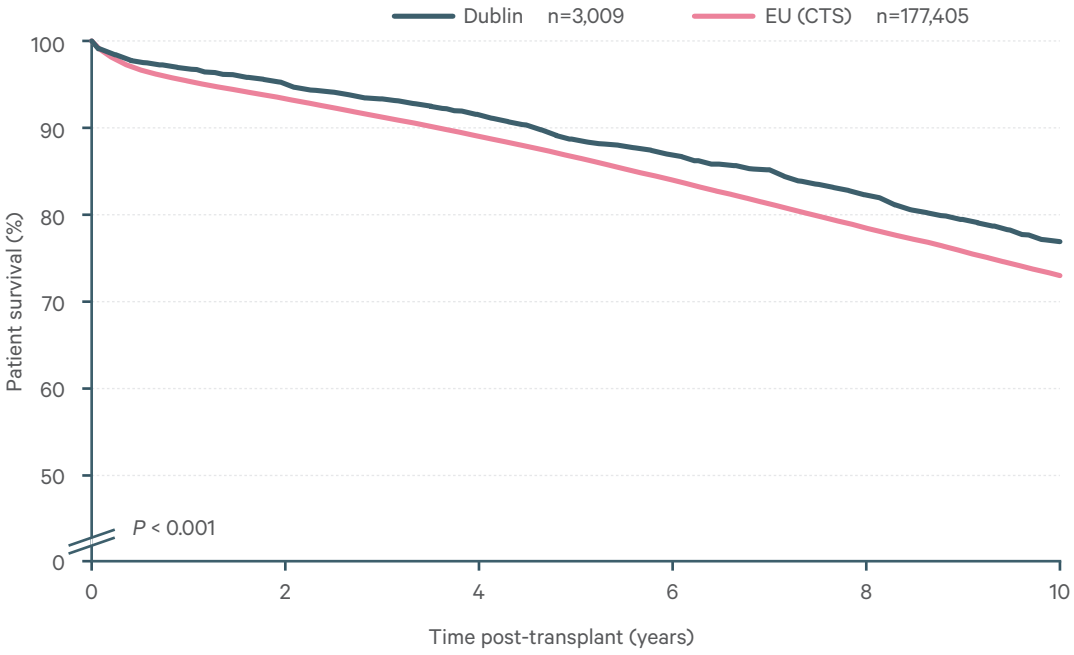


Figure 6.2: EU (CTS) comparison of adult first deceased-donor kidney patient survival by era transplanted

First deceased donor kidney transplants, adults

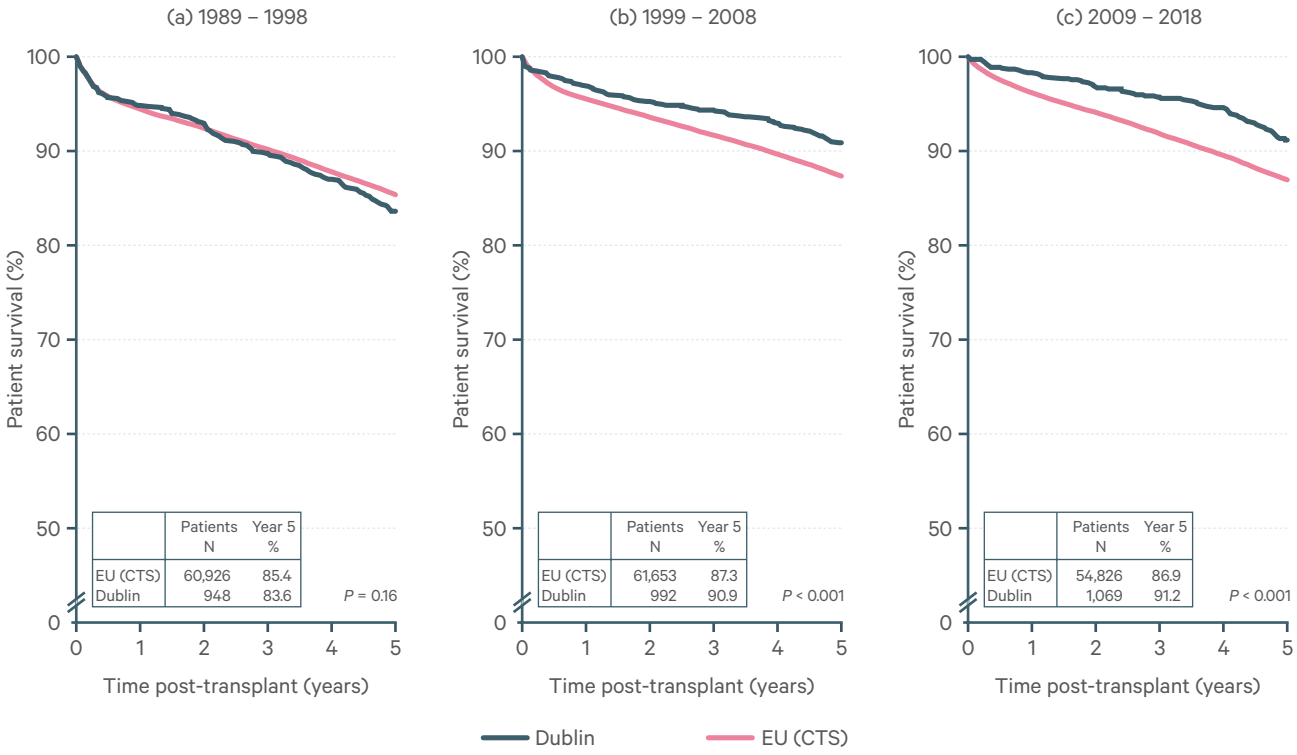


Figure 6.3: EU (CTS) comparison of adult first deceased-donor kidney allograft survival

First deceased donor kidney transplants, adults 1989 – 2018

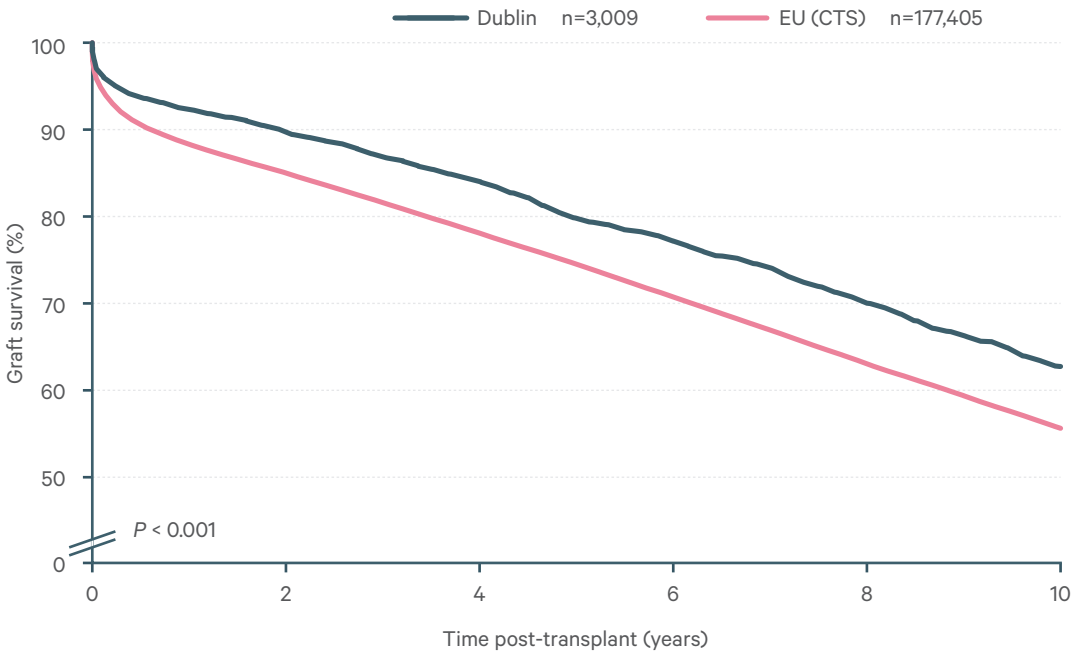
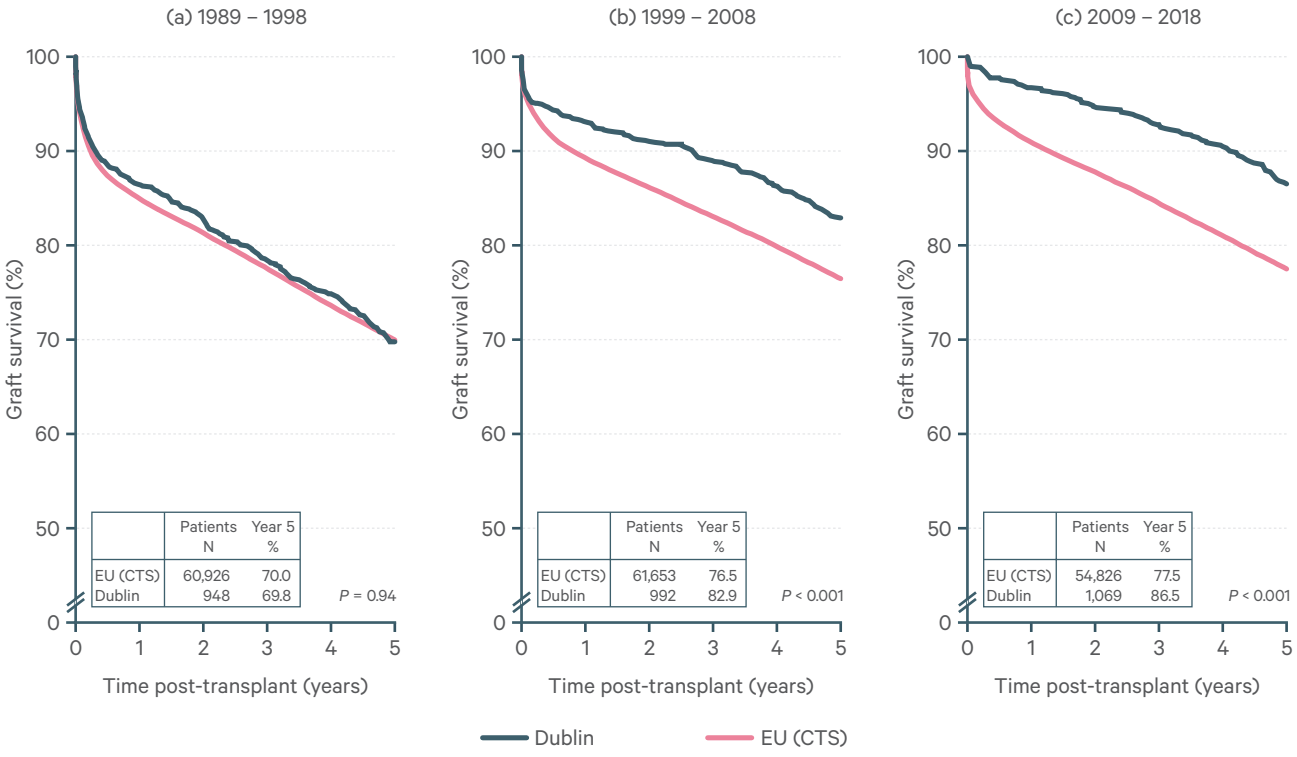


Figure 6.4: EU (CTS) comparison of adult first deceased-donor kidney allograft survival by era

First deceased donor kidney transplants, adults



The probabilities of transplant survival and patient survival have steadily improved among recipients of both living and decreased donor kidney transplants, reflecting the fact that the NKTS continues to seek improvements in their service

Figure 6.5: EU (CTS) comparison of adult retransplanted deceased-donor kidney allograft survival by era

Deceased donor kidney retransplants, adults

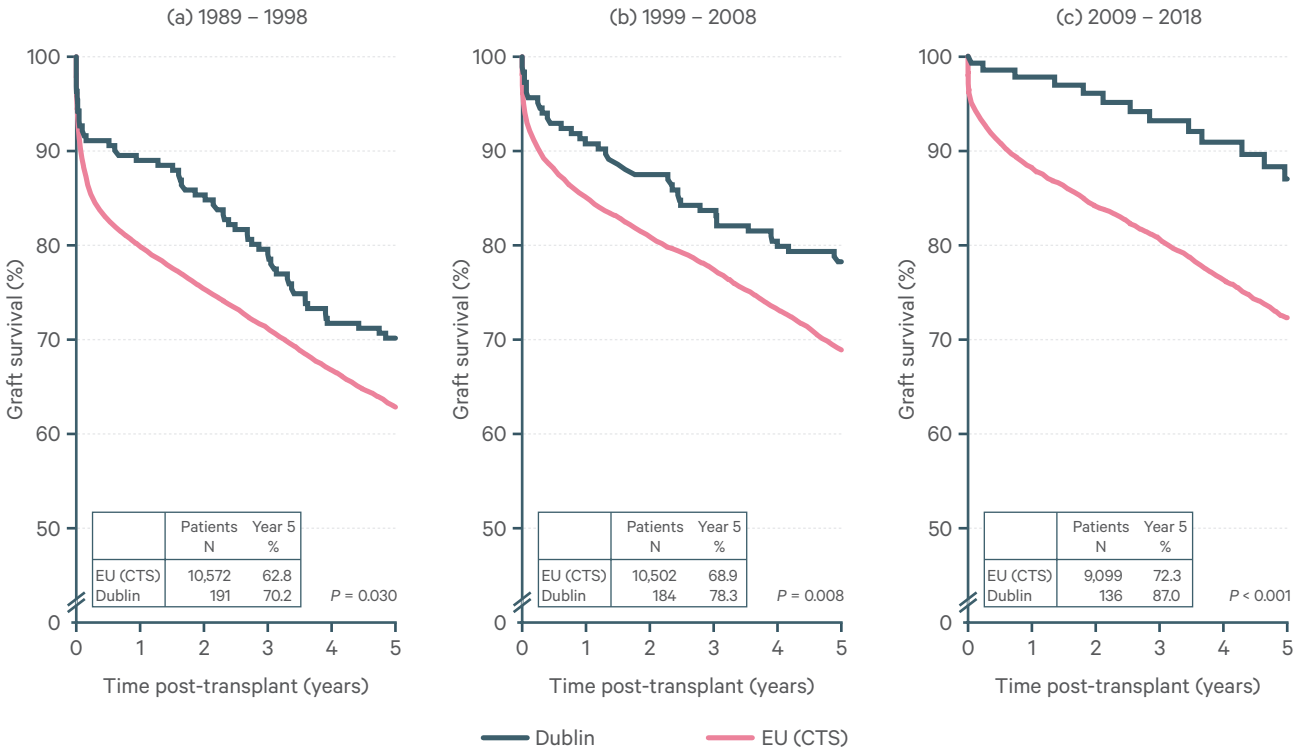


Figure 6.6: EU (CTS) comparison of paediatric first deceased-donor kidney allograft survival

First deceased donor kidney transplants, paediatrics (< 18 years) 1989 – 2018

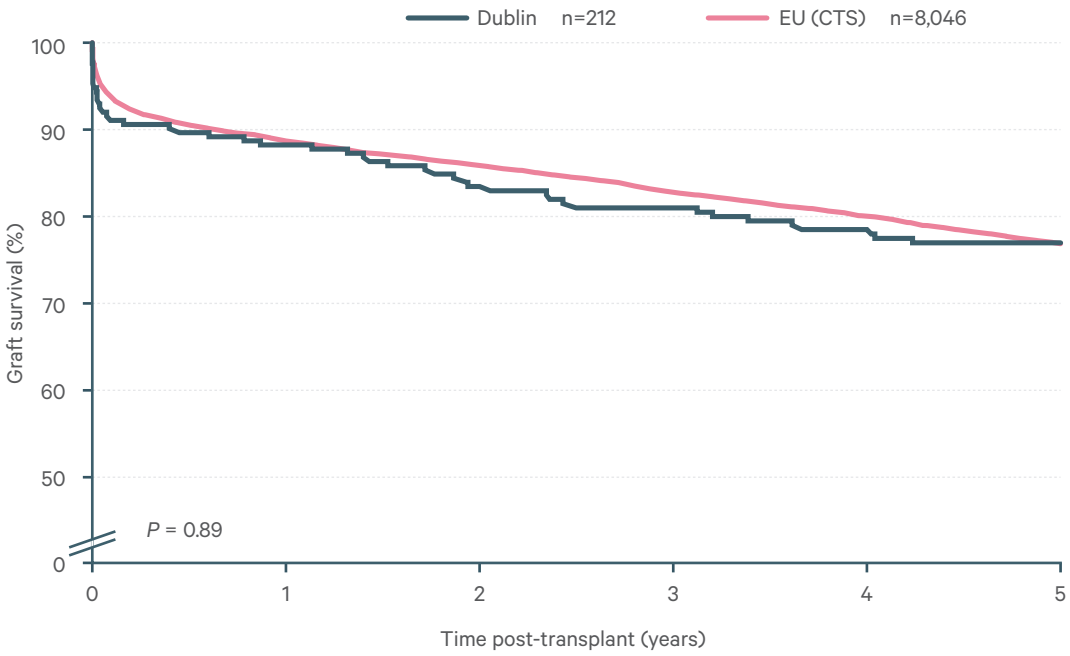


Figure 6.7: EU (CTS) comparison of adult first living-donor kidney patient survival

First living donor kidney transplants 2008 – 2018, adults (≥ 18 years)

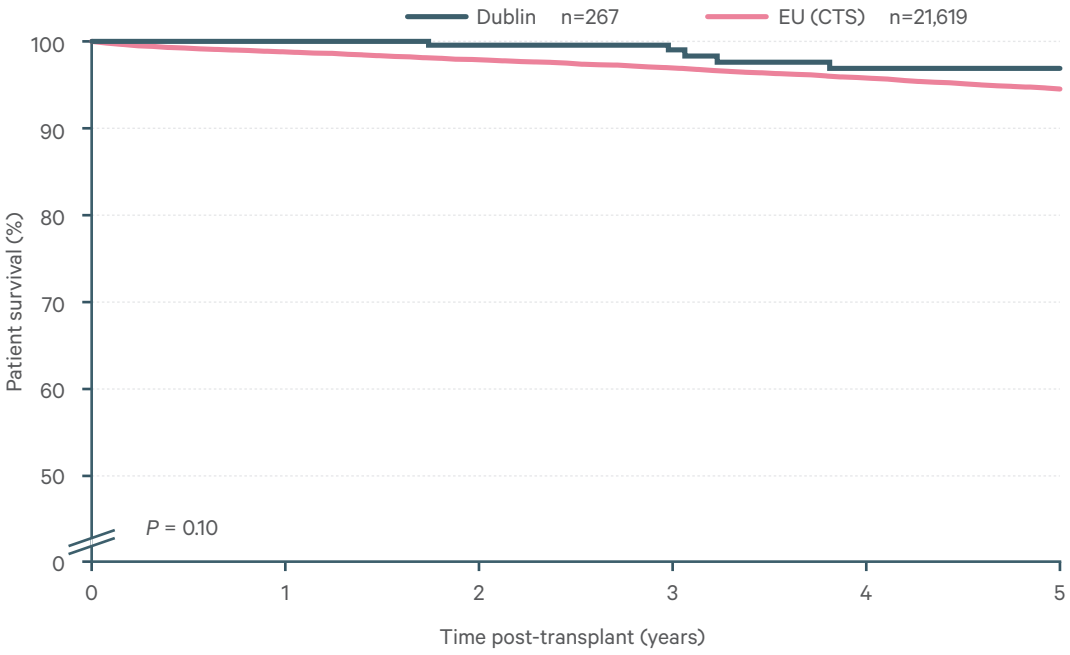


Figure 6.8: EU (CTS) comparison of adult first living-donor kidney allograft survival

First living donor kidney transplants 2008 – 2018, adults (≥ 18 years)

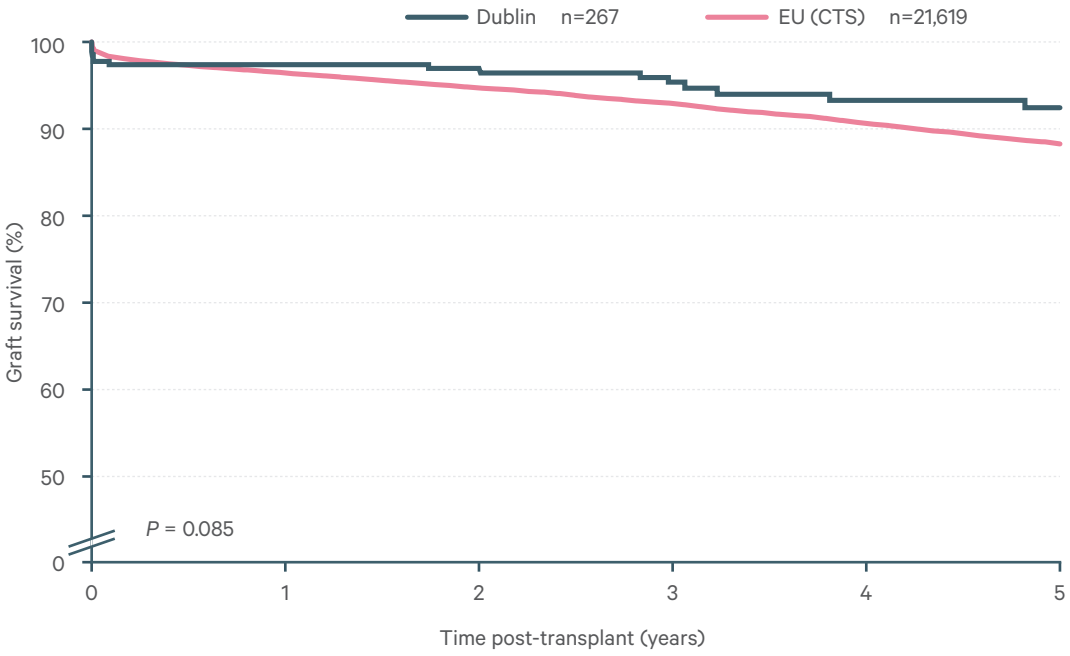
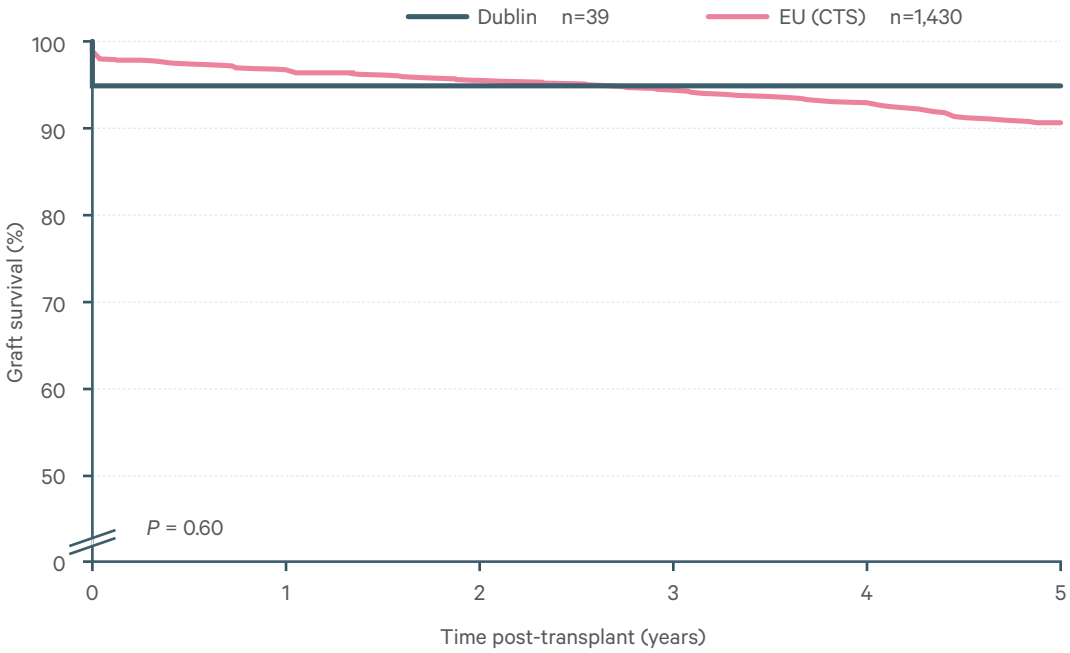


Figure 6.9: EU (CTS) comparison of paediatric first living-donor kidney allograft survival

First living donor kidney transplants 2008 – 2018, paediatrics (< 18 years)



Long term patient and allograft survival compares favourably with European centres

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 2018 ERA/EDTA report released in November 2020.

- **The overall kidney transplant rate PMP (per million population) was 34 for Ireland during 2018. The countries with the highest rates of kidney transplantation are Spain, Northern Ireland, the Netherlands and Scotland with 71, 57, 56 and 55 PMP respectively (Figure 6.10).**

- **Deceased donor kidney transplant rate PMP is 26 for Ireland. The countries with the highest rates of deceased donor kidney transplantation are Spain, Czech Republic, France and Portugal with 65, 46, 45 and 43 PMP respectively (Figure 6.11).**

- **Living donor kidney transplant rate PMP is 8 for Ireland. Countries with the highest rates of living donor kidney transplantation were Turkey, The Netherlands, Northern Ireland, and Iceland with 37, 28, 27 and 26 PMP respectively (Figure 6.12).**

Figure 6.10: Total rates of transplantation PMP for EDTA countries and Ireland for 2018

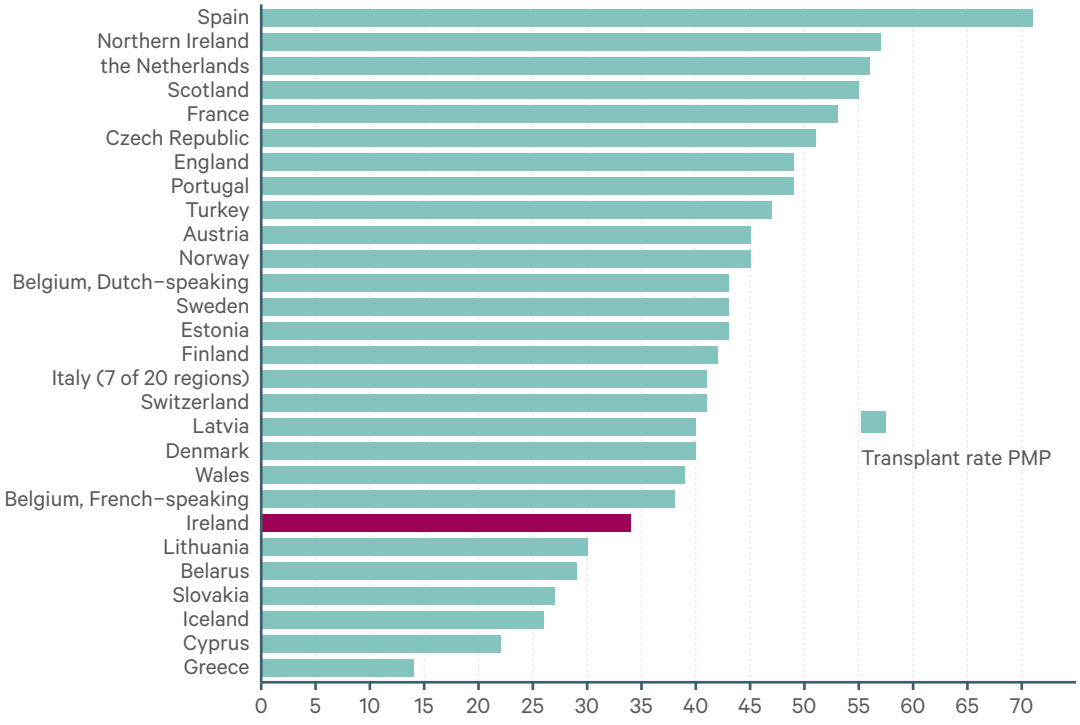


Figure 6.11: Deceased donor rates of transplantation PMP for EDTA countries and Ireland for 2018

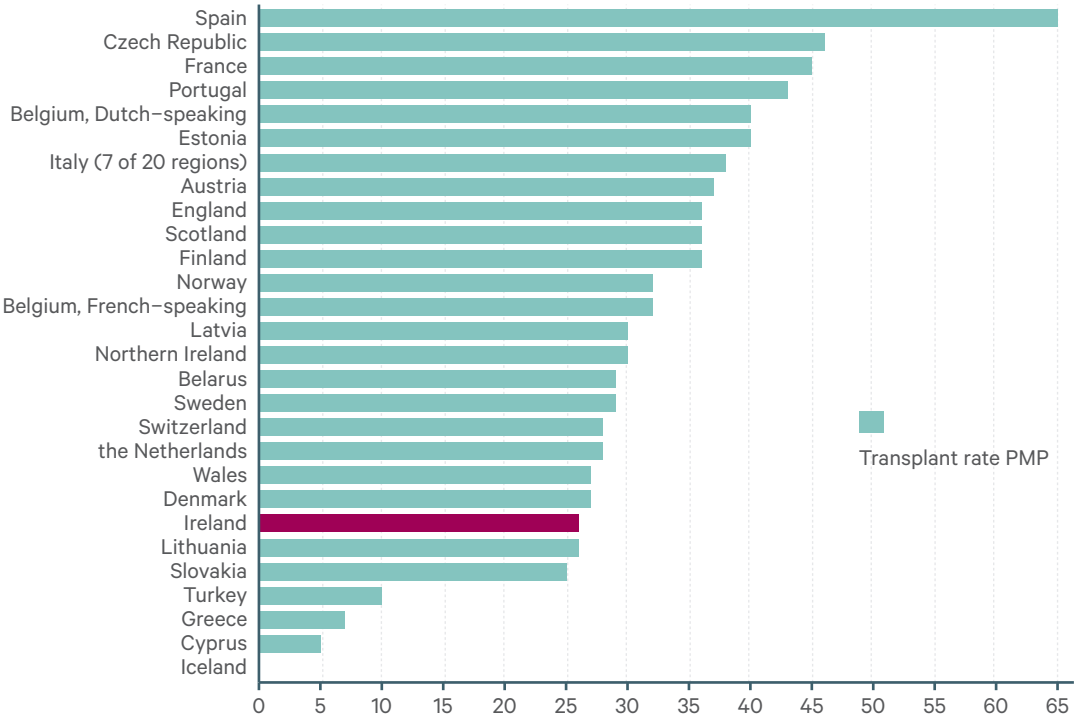
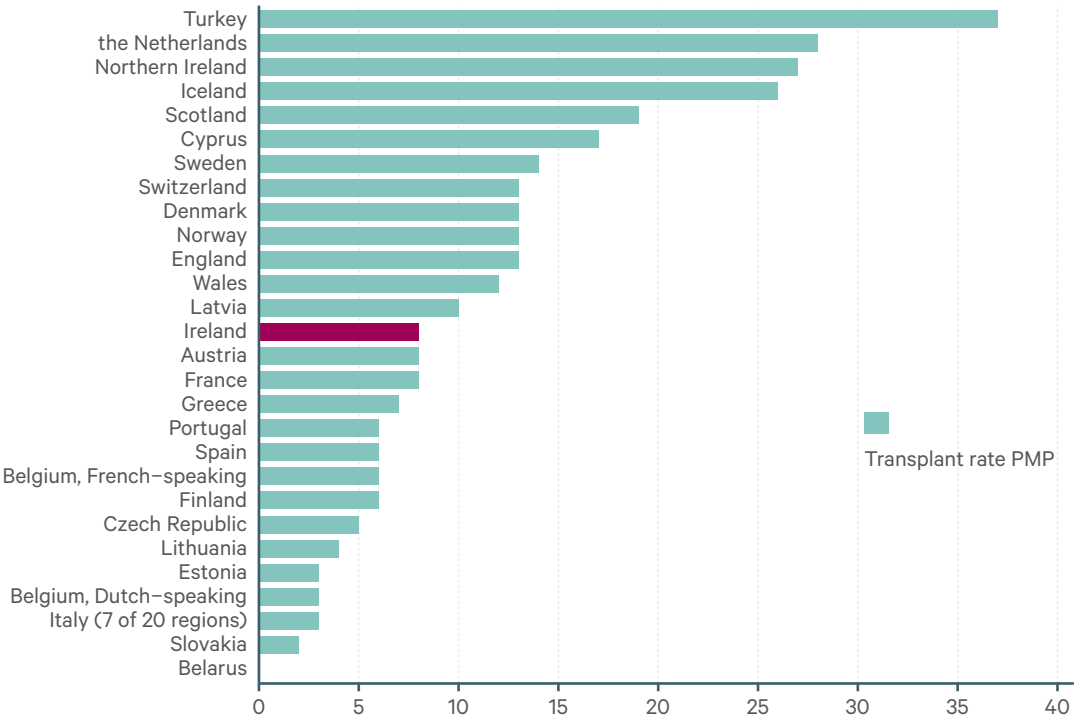


Figure 6.12: Living donor rates of transplantation PMP for EDTA countries and Ireland 2018



SECTION 7

Living Donor Programme

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 an allograft 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 allograft 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, this was legislated into Irish law in August 2012.

COVID-19 posed particular difficulties for the Living Donor Programme in 2020. However, 98 potential donors were immunologically evaluated for 74 recipients. This reflected a decrease of 49% presenting for evaluation compared to previous year activity. 63 potential donors were medically assessed and underwent investigations to determine suitability to proceed with live donation. Of the 63, five had opted for the Paired Kidney Exchange Programme in collaboration with our colleagues in the UK. Of note these donor recipient pairs can now be seen in Belfast as part of cross –border collaboration which has practical advantages (e.g. travel and access) for all involved. Of the 58 potential direct living donors medically assessed 13 have proceeded to donation in addition to the 15 who commenced work-up in 2019.

- **There were 28 living donor kidneys transplanted in 2020.**
- **In the period 2001 – 2020 donation to adults occurred mainly between siblings (51%), spouses (16.5%), parents (16%) and children (9%). However for paediatric recipients, parents are in the majority at 83% (Figure 7.1).**
- **Overall females are more likely to donate at 53% (Figure 7.2).**
- **Median age at donation was 44 overall with unrelated donors having a median age of 52 years and adult children to parent 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 (33 years). Donor ages ranged from 20 to 72 (Figure 7.3).**
- **The median length of in hospital stay for living donors was four days for 2020. For later time periods 2011 – 2015 and 2016 – 2020 this reduced to 5 days reflecting the advancement of minimal invasive surgical techniques (Figure 7.4).**
- **All living donors are followed up by surgical team and are then offered an annual follow-up with their local nephrologist, 81% of living donors are availing of this service. The median length of time of follow up is 36 months ranging from 1 month to 215 months (17.9 years).**
- **At follow up, 12% of all living donors developed hypertension post donation. The highest risk was in older age group > 55 years (18%) (Figure 7.5).**
- **As expected the renal function (eGFR) declines post donation but recovers to a baseline of 66 (ml/min/1.73m^2) at 5 years from a median level of 99 (ml/min/1.73m^2) pre donation.**

Figure 7.1: Relationship between living donor and recipient

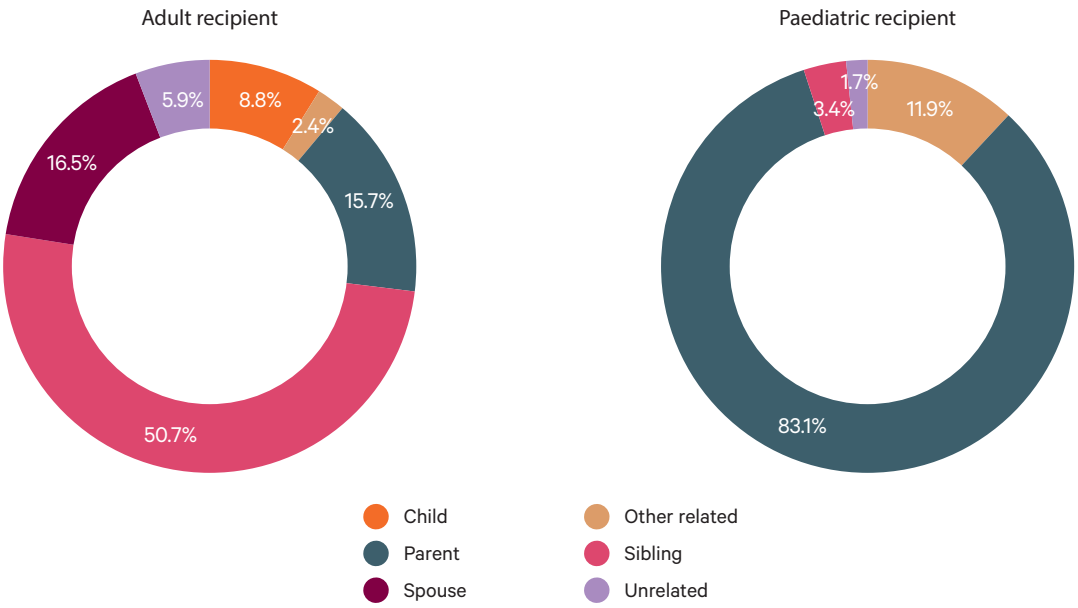


Figure 7.2: Percentage donor sex by donor type of relation

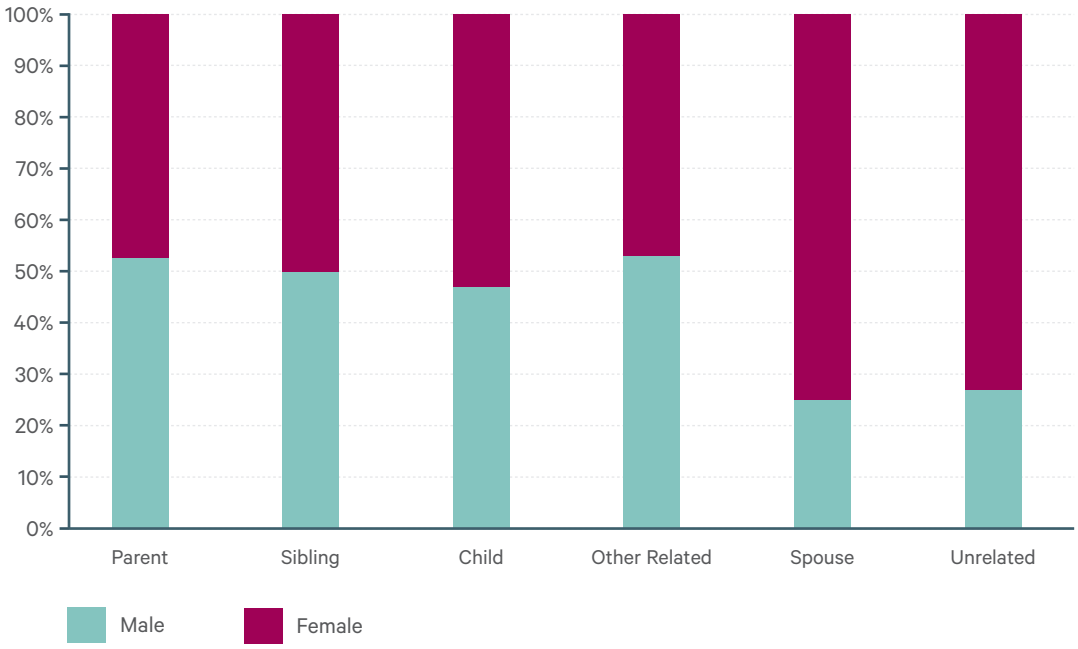


Figure 7.3: Percentage donor age groups by donor type of relation

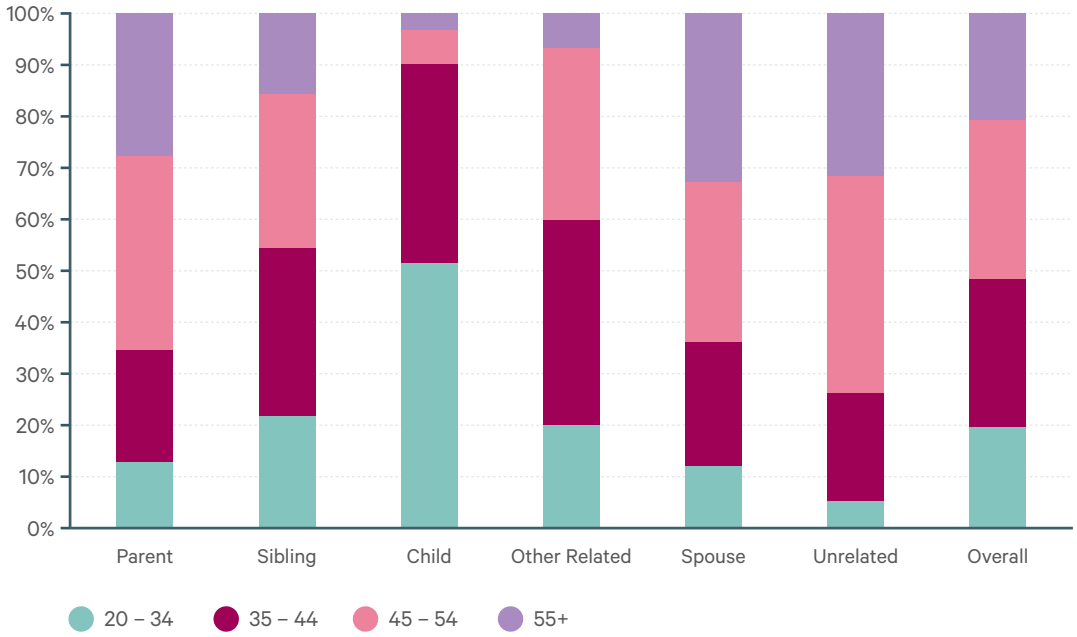


Figure 7.4: Length of stay of living donors by time period of donation

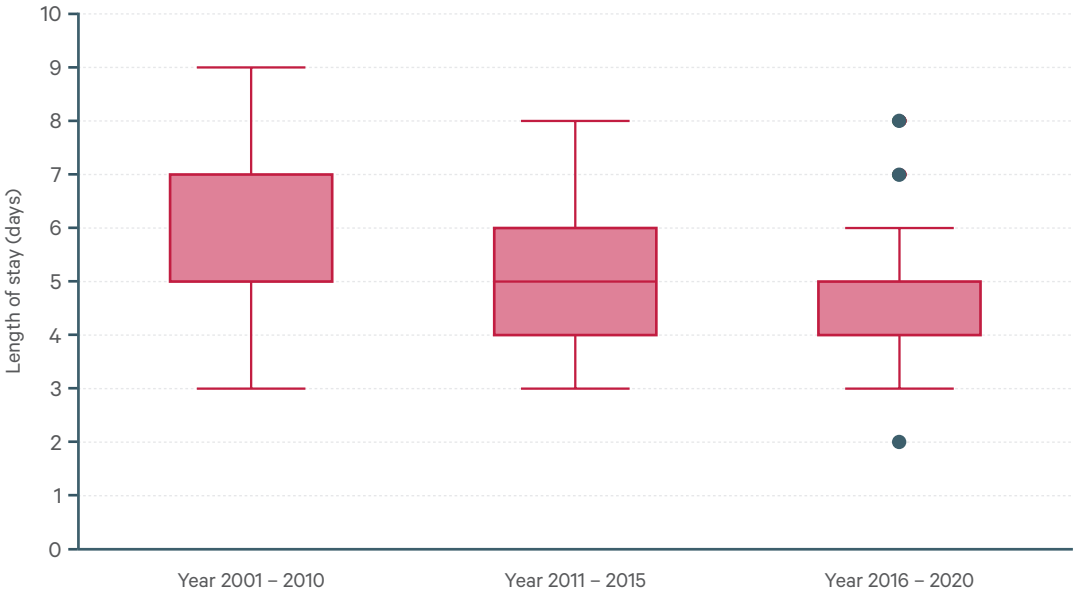


Figure 7.5: Percentage of post donation hypertension by donor age group

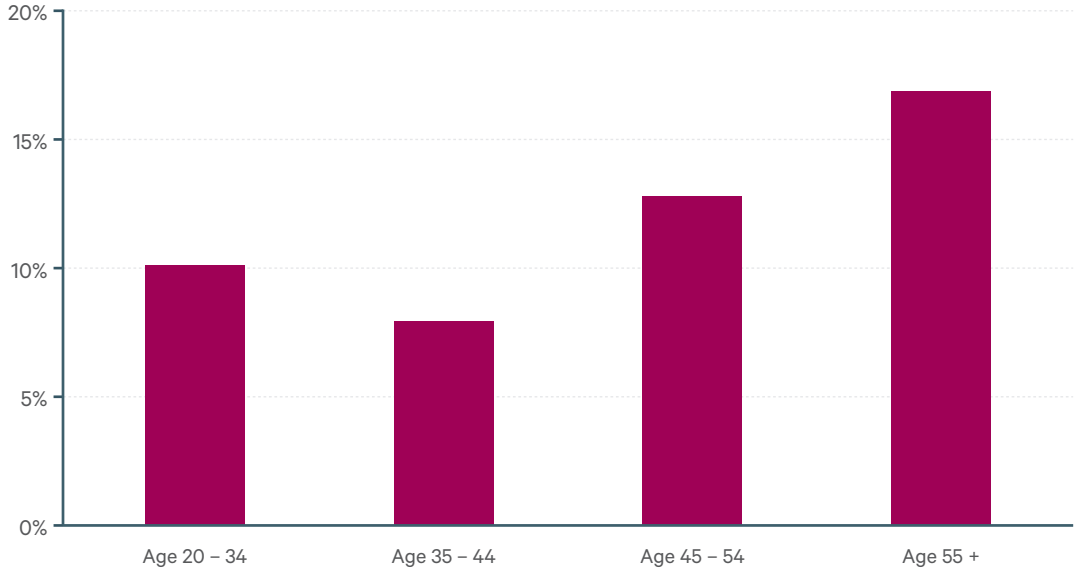
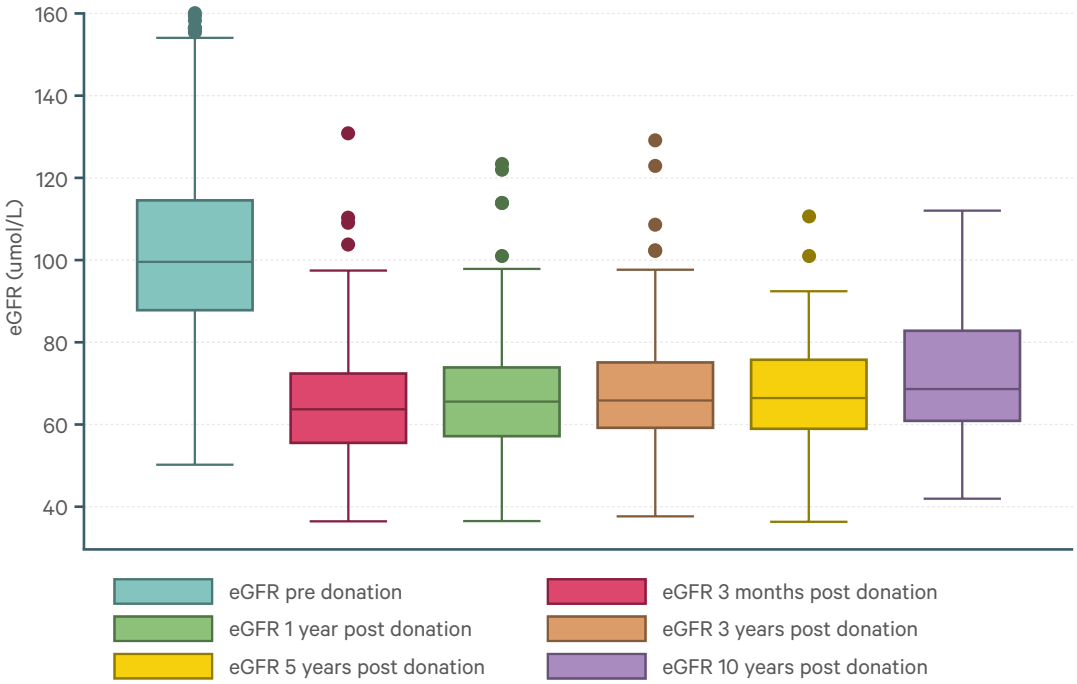


Figure 7.6: Median and interquartile eGFR for living donors pre and post donation



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
Mr Ati Ferede 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
Dr Carol Traynor 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 Annmarie Mulligan Directorate Nurse Manager
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 Marisa Pinheiro Transplant CNS
Ms Fiona Downes Acting Transplant CNS
All transplant nursing, healthcare and household staff

Transplant Co-ordinators
Ms Laura Austin CMN3
Ms Andrea Fitzmaurice CMN2
Ms Laura Lynch CNM2
Ms Marion Stacey CMN2
Ms Laura Motherway CNM2

Renal day care nursing team
Ms Michelle Newe CNM2 Renal day care
Ms Ciara Tolan CNM1 Renal day care
Ms Olive McEnroe CNS Ambulatory care
Ms Caitriona McNamara CNM1 Ambulatory care
Ms Louise McSkeane CNM Ambulatory care
Ms Ruth O'Malley CNM Ambulatory care
Ms Brenda Groarke Patient Care Co-ordinator
Ms Andrea Scully Patient Care Co-ordinator
Ms Jane Ormond Patient Care Co-ordinator
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 and household staff

TUN Directorate Staff
Mr Tom Moran Directorate Business Manager
Mr Binu Vasu Renal IT Manager
Mr Patrick O'Kelly Statistician
Ms Anne Cooney Renal Transplant Data Manager
Ms Sinead Cronnolly Quality Manager
Ms Caroline Hughes
Ms Mary Sullivan
Ms Claire Kavanagh
Ms Laura Byrne

Clerical Staff
Ms Jennifer Cronin
Ms Kim Kavanagh/Ms Anna Farley
Ms Mary Dowdall/Ms Rebecca Moran
Ms Rita Mather
Ms Joan Long
Ms Rebecca Kavanagh
Ms Gillian O'Rourke
Ms Aisling Connolly/Ms Gillian Curran
Ward clerks Marie Fitzpatrick, Mary Butler, Liz Mythen,
Betty Pender/Theresa Cooling & Denise Redmond/Amanda Walsh
Ms Kim Kavanagh/Ms Anna Farley
Ms Mary Dowdall/Ms Rebecca Moran

Critical Care and Anaesthetic Directorate, Beaumont Hospital
Dr Margaret Bourke Clinical Director
Dr Michael Power 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 Eileen Buckley 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
Prof 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
Dr. Ciara Keogh
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 Mark Given 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

Academic Publications 2020

1. **Long-term outcome of transplant ureterostomy in children: A National Review.** Costigan CS, Raftery T, Riordan M, Stack M, Dolan NM, Sweeney C, Waldron M, Kinlough M, Flynn J, Bates M, Little DM, Awan A. Pediatr Transplant. 2020 Nov 20:e13919. doi: 10.1111/petr.13919. Online ahead of print.PMID: 33217168
2. **Predictors of long-term renal allograft survival after second kidney transplantation**. O'Kelly JA, Davis NF, Ferede AA, Breen KJ, O'Kelly P, MacCraith E, Forde J, Mohan P, Power R, Smyth G, Little DM. Clin Transplant. 2020 Aug;34(8):e13907. doi: 10.1111/ctr.13907. Epub 2020 Jun 14.PMID: 32416641
3. **Risk factors and long-term consequences of new-onset diabetes after renal transplantation.** Tomkins M, Tudor RM, Cronin K, O'Kelly P, Williams Y, Little D, de Freitas DG, Denton M, O'Seaghdha C, Conlon P, Smith D. Ir J Med Sci. 2020 May;189(2):497-503. doi: 10.1007/s11845-019-02112-6. Epub 2019 Oct 21.PMID: 31631244
4. **Assessment of renal vascular anatomy on multi-detector computed tomography in living renal donors.** O'Neill DC, Murphy B, Carmody E, Trench L, Dunne R, Lee MJ, Little D, Morrin MM. J Med Imaging Radiat Oncol. 2020 Aug;64(4):484-489. doi: 10.1111/1754-9485.13050. Epub 2020 May 22.PMID: 32441449
5. **Venous anomalies in renal transplantation: an accessory left-sided IVC in a live kidney donor.** Whooley J, Ferede A, Smyth G, Little D. BM. J Case Rep. 2019 Dec 16;12(12):e232695. doi: 10.1136/bcr-2019-232695.PMID: 31848141
6. **Progressive improvement in short-, medium- and long-term graft survival in kidney transplantation patients in Ireland – a retrospective study.** Sexton DJ, O'Kelly P, Williams Y, Plant WD, Keogan M, Khalib K, Doyle B, Dorman A, Süsal C, Unterrainer C, Forde J, Power R, Smith G, Mohan P, Denton M, Magee C, de Freitas DG, Little D, O'Seaghdha CM, Conlon PJ. Transpl Int. 2019 Sep;32(9):974-984. doi: 10.1111/tri.13470. Epub 2019 Aug 14.PMID: 31209932
7. **The Irish experience of kidney transplantation among recipients with prior non-renal solid organ transplants: A retrospective study on short- and long-term outcomes.** Ferede AA, O'Connell C, Davis NF, Mohan P, Robertson I, O'Kelly P, Little DM. Clin Transplant. 2020 Nov 22:e14156. doi: 10.1111/ctr.14156. Online ahead of print.PMID: 33222237
8. **Surveillance of common infections in the early period after renal transplantation in a national centre: 2014 – 2017.** O'Connell K, Kennedy C, Skally M, Alex S, O Seaghdha C, Davis N, Humphreys H, Burns K. Transpl Infect Dis. 2020 Feb 9:e13261. doi: 10.1111/tid.13261. PMID: 32037682
9. **Cancer survival in kidney transplant recipients in Ireland**. Murray SL, O'Leary E, De Bhailís ÁM, Deady S, Daly FE, O'Kelly P, Williams Y, O'Neill JP, Sexton DJ, Conlon PJ. Nephrol Dial Transplant. 2020 Oct 1;35(10):1802-1810
10. **The impact of switching to mTOR inhibitor-based immunosuppression on long-term non-melanoma skin cancer incidence and renal function in kidney and liver transplant recipients.** Murray SL, Daly FE, O'Kelly P, O'Leary E, Deady S, O'Neill JP, Dudley A, Rutledge NR, McCormick A, Houlihan DD, Williams Y, Morris PG, Ni Raghallaigh S, Moloney FJ, Sexton DJ, Conlon PJ. Ren Fail. 2020 Nov;42(1):607-612
11. **Polygenic risk score of non-melanoma skin cancer predicts post-transplant skin cancer across multiple organ types.** Stapleton CP, Chang BL, Keating BJ, Conlon PJ, Cavalleri GL. Clin Transplant. 2020 Aug;34(8):e13904
12. **Renal transplant outcomes in patients with autosomal dominant tubulointerstitial kidney disease.** Cormican S, Kennedy C, Connaughton DM, O'Kelly P, Murray S, Živná M, Kmoch S, Fennelly NK, Benson KA, Conlon ET, Cavalleri GL, Foley C, Doyle B, Dorman A, Little MA, Lavin P, Kidd K, Bleyer AJ, Conlon PJ. Clin Transplant. 2020 Feb;34(2
13. **Surveillance of common infections in the early period after renal transplantation in a national centre: 2014-2017.** O' Connell K, Kennedy C, Skally M, Foley M, Alex S, Magee C, Davis NF, Humphreys H, Burns K. Transpl Infect Dis. 2020 Jun;22(3):e13261. doi: 10.1111/tid.13261. Epub 2020 Feb 24.PMID: 32037682
14. **Immune response following infection with SARS-CoV-2 and other coronoviruses: A rapid review.** O'Murchu E, Byrne P, Walsh KA, Carty PG, Connolly M, De Gascun C, Jordan K, Keogan M, O'Brien KK, O'Neill M, Smith SM, Teljour C, Ryan M, Harrington P. Rev Med Virol. 2020 Sep 23:e2162.doi: 10.1002/rmv.2162. Online ahead of print.PMID: 32964627. FreePMC article.

National Kidney Transplant Service

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E: transplantcoordinators@beaumont.ie
www.beaumont.ie/kidneycentre

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