2013 Annual Report
Kidney Transplantation

- **Heart and Lung TransplantInformation**
- **Kidney TransplantInformation**
- **Kidney TransplantInformation for recipients under 18 years old**

Thai Transplantation Society

Message from President of Thai Transplantation Society

This Transplant report has beencollected forthe organ transplant information and has purpose in developing organ transplant system in Thailand. Aswe are aware that organ transplantationis important in medical professionadvancement that has ability to take back the chronic disease patients such as chronic kidney disease,cirrhosis, andlast stage of heart failure to spend their normal and good quality of life once again. Nowadays, the transplant knowledge has fast evaluated in both width and depth related to Basic Transplantation, Immunology and new immunosuppressive medicationfor organ transplant recipients. It is very necessary that doctors who work in transplantation should follow up with the new knowledge.

As we are aware that the shortage of kidney and other organs donation, is a big problem in transplant system. The last stage of kidney failure is important to the public health's problem because the patients has higher risk to death and waste ofmedical fee. However, the treatment which is suitable for the long-term quality of the patient life during the last stage of kidney failure is kidney transplantation. From the stated reason, The Transplantation Society in coordinating with Ministry of Public Health, The Organ Donation Center of Thai Red Cross Society, National Health Security Office, The Comptroller General's Department, Department of Public Welfare and The Kidney Foundation of Thailand to push forwardtransplantpolicy, especially in for those patients who has brain death to donate their organs and manage transplantsupportive in hospital, throughout nursing care after kidney and other organs transplantation such as kidney and pancreas transplantation, heart and lung transplantation in order to support the medical team who is performing transplantation to haveabetter way and effect in healthy transplantation in Thailand.

On behalf of President and committee of Thai Transplant Society, would like to thank you, the registration subcommittee for reporting organ transplantation of 2013 with hope that this book will be useful for doctors, nurses and medical staffs for future references.

Assistant Professor Kriengsak Vareesangthip, MD
President of Thai Transplantation Society

Preface

This Annual Report of the Transplantation in 2013 is more completed when comparing with the previous year since it has been collected the report of heart and lung transplantation including kidney transplant recipients aged less than 18 years old. As additional to the kidney transplant annual report. All the information has been collected by coordinating nurses together with the surgeons of transplantation. Kidney physician and kidney pediatrician from organ transplantation office in order to analyze and aware of transplant situation in Thailand.

For heart and lung transplant information, Assistant Professor Pat Ongcharit and his team has been collected the patients information who received the surgery in 2013 so that heaware the advancement and challenging factor in heart and lung transplantation nowadays. For annual report of kidney transplantation, Dr. Kajornsak Noppakun and his team has been bringing out the information from all fields to analyze in several dimensions,such as kidney donors and recipients information, the usage of immunosuppressive medication, the patients survivalrate and the kidney survival rate, including the right to medical treatment. With this kidney transplant annual report for 2013 has covered more several analyzing details than previous year. For those kidney recipients under 18 years old were important group which will be taken care of by kidney pediatricians and some part will be cared for by kidney physicians and surgeons. In this year, Dr. Pornpimol Rianthavorn has interestingly collected and analyzed the stated patient's group.

The registration subcommittee would like to thank you The Thai Transplantation Society's organizing committee for supporting in establish annual report of organ transplantation, coordinating nurses for sending patients' information from each institutes, Assistant Professor Pat Ongcharit, Dr. Kajornsak Noppakun, Dr. Pornpimol Rianthavorn and team for gathering and analyzing information Ms. Nonnuch Khatiya and Ms. Pharita Kilee for general coordination, including staffs, doctors and nurses from each kidney institutions which make success in completing this report for kidney and pancreas transplant information in Thailand and expected that it will be presented in the future.

The registration subcommittee expects that annual report of organ transplantation in 2013 will be useful for doctors, nurses, staffs and anyone interested in this report for their reference in other field such as academic, public health economic, including strategic management in future kidney transplantation.

The registration subcommittee of organ transplantation
Thai Transplantation Society
Year 2013-2014

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Year 2013-2014

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Year 2013-2014

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Information of heart and lung transplantation

Information of heart and lung transplantation

From 2008-2013, 50 patients has received heart transplantation from 5 hospitals e.g. Chulalongkorn, Siriraj, Rajavidhi, Chest Disease Institute and Bumrungrad as shown in table 1.1

Table 1.1 Amount of heart transplant recipients, separated by years and hospitals.

	Year					
	2008	2009	2010	2011	2012	2013
Chulalongkorn	3	5	3	7	8	6
Siriraj		1	2	1	4	4
Rajavidhi	1					2
Chest Disease Institute		2				
Bumrungrad	1					
Total	**5**	**8**	**5**	**8**	**12**	**12**

By 2013, 12 patients werereceived heart transplantation as shown in table 1.1, the average aged was 42.1 $\pm$ 12.7 years old. Average waiting time for heart transplantation is equivalent to 64.3 days, 3 patients have received ventricular assist device (VAD) before surgical operation, 1 patient received ECMO (extracorporeal membrane oxygenation and 1 patient received ECMO and transfer to ventricular assist device before heart transplantation for underlying disease of patientsas shown in table 1.2.

Table 1.2 Reason of underlying disease of patients who received heart transplantation.

Disease	Amount
Dilated cardiomyopathy	7
Dilated cardiomyopathy s/p AICD (automatic implantable cardioverter defibrillator)	1
Hypertrophic cardiomyopathy with pulmonary stenosiss/p valvulotomy	1
Acute myocardial infarction	1
Postchemotherapy myocarditis	1
Complex congenital heart disease s/p redo TVR, IABP	1
Total	**12**

In 2013, the information from Chulalongkorn Hospital found that there are only 43 cases from 176 brain donors who are capable and suitable for heart donation, 6 patients has heart transplantation and 37 heart donors could not be used since there is 21 recipients with no compatible ABO, 6 cases has obstacles in heart transplantation because the donor location is not suitable, 4 cases are not suitable by size and 6 cases has irregular heart pulsation.

In 2013, there was 1 recipient who causes idiopathic pulmonary fibrosis for single lung transplantation and there is no recipients for heart-lung transplantation during that time.

The information from the Siriraj Hospital found that the challenging factor in heart and lung and heart-lung transplantation for previous period of time e.g the shortage of suitable heart and lung donors, the shortage of budget and medication fee supportive for mechanical circulatory support devices before organ transplantation and transplant immunology lab, the shortage of expert heart physicians throughout suitable time for recipients has complications that is necessary to use ventricular assist device before surgical operation.

Information of Kidney Transplantation

Information of Kidney Transplant Recipients

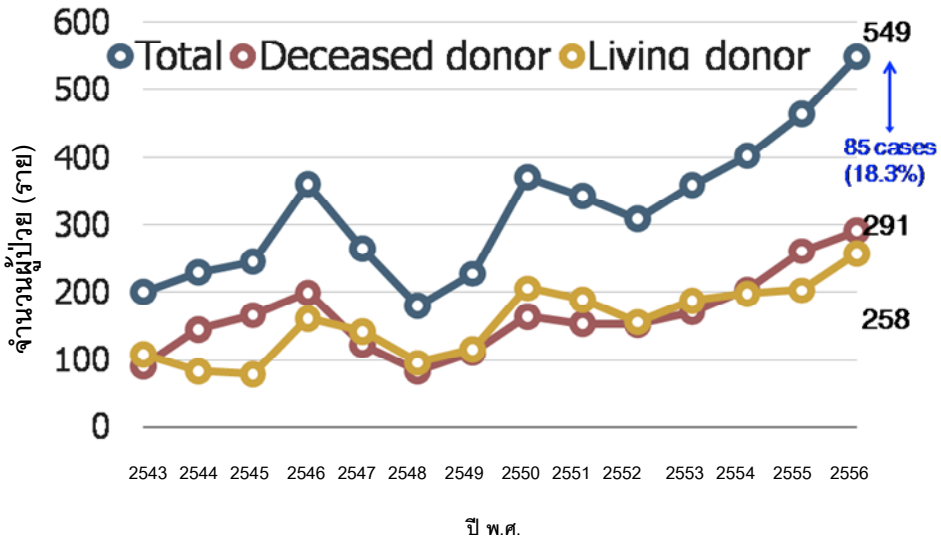
Amount of Kidney Transplant Recipients in2013

Between the previous year of 2013 (January 1, 2013 – December 31, 2013), 549 patients have kidney transplantation from 26 hospitals, by 258 of living donors and 291 of deceased donors, separated by hospitals as shown in table 2.1

Table 2.1 Amount of Recipients in 2013, separated by hospitals.

	Kidney Transplant Recipients from Living donors	Kidney Transplant Recipients from Deceased donors	Total
Ramathibodi	53	69	122
Siriraj	43	25	68
Srinakarin, Khon Kaen	3	63	66
Chulalongkorn	31	24	55
Chiang Mai	26	24	50
Praram 9	25	23	48
Rajavidhi	7	12	19
Sapphasitprasong	3	13	16
Phramongkutklao	7	8	15
Vachira	10	3	13
Bhumibol Adulyadej	8	4	12
Thammasat	6	4	10
Bumrungrad	5	3	8
Buddhachinnaraj	7	0	7
Songklanakarin	4	2	6
Police General	2	4	6
Phayathai 1	0	5	5
Bangkok	1	2	3
Khon Kaen	3	0	3
Hat Yai	3	0	3
Maharaj Nakornracasima	3	0	3
Smithivej Srinakarin	1	2	3
Chonburi	2	0	2
Smithivej Sukhumvit	1	1	2
Suratthani	2	0	2
Udontani	2	0	2
Total	**258**	**291**	**549**

There were 18.3% increase in kidney transplant recipients found in 2013, which were 27.1% of living donors and 11.5% of deceased donors.

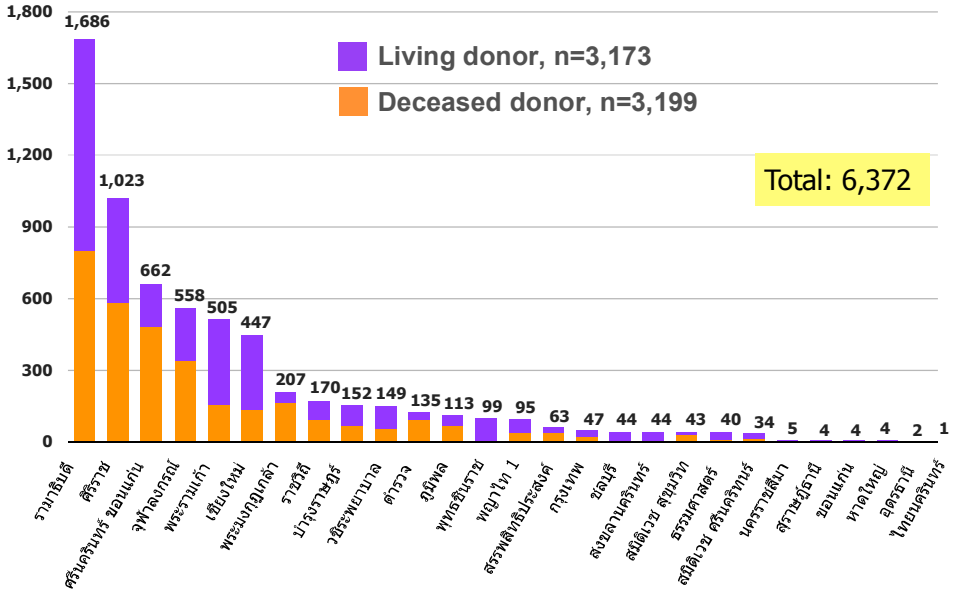


Picture 2.1 Amount of kidney transplantation each year since 2000, separated by kidney transplant category.

From picture 2.1 shown the information of kidney transplantation since 2000, there are a lot of kidney transplant recipients who formally registered in 2003 and 2007. The Kidney Foundation of Thailand established the occasion to give a royal charity dedicated toHer Majesty, HRH Princess Galyani Vadhana Kromma Luang Naradhiwas Rajanagarindra for her 80th Birthday and in 2007, established "The kidney is the charity dedicated 80/ 84 years"to give a royal charity dedicatedon the occasion of 80th Birthday Anniversary for His MajestyThe King and HRH Princess Galyani Vadhana Kromma Luang Naradhiwas Rajanagarindraon the occasion of 84th Birthday Anniversary which cause the increasing of kidney transplant recipients until today.

In 2004, Social Security Office protect the right of kidney transplant for insurer and in 2008, National Health Security Office, Thailand approved to add the kidney transplant in the universal health care.

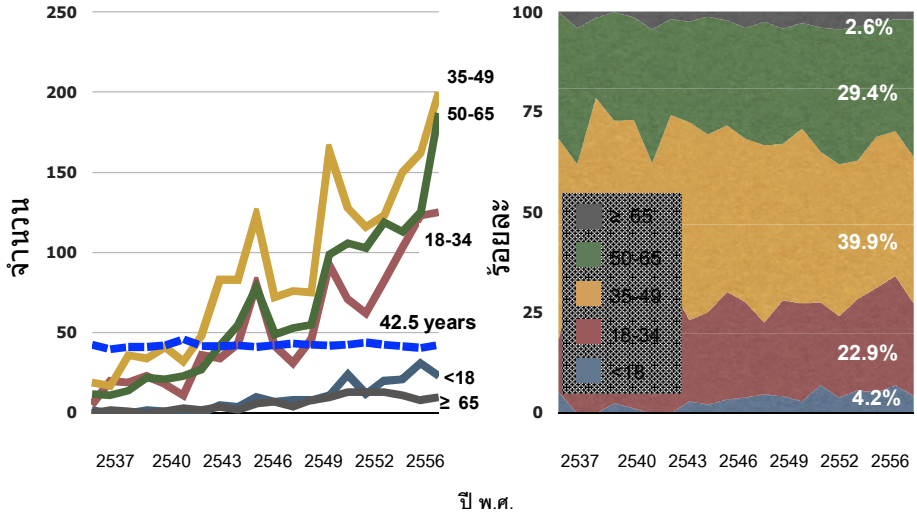
There were 6,372 kidney transplant recipients in Thailand, 3,173 of living donors and 3,199 of deceased donors, as shown in picture 2.2.



Picture 2.2 Amount of all kidney transplant recipients in Thailand, separated by hospitals.

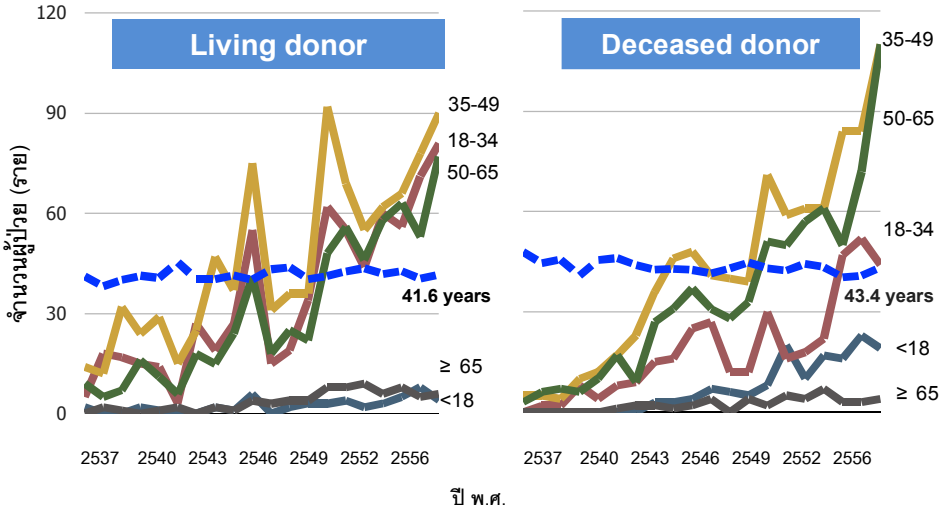
Information of kidney transplantation in 2013

The average age of kidney transplant in 2013 equal to 42.5 $\pm$ 13.1 years old, even though it has been increasing in every span of age but found that the kidney transplant recipients under 18 years old were lesser when compare with 2012. The proportion of kidney transplant in 2013 by span of age, found that 4.2% were recipients under 18 years old, 22.9% were recipients aged 18-34 years old and 39.9% were recipients aged 35-49 years old, 29.4% were recipients aged 50-65 years old and 2.6% were recipients over 65 years old as shown in picture 2.3.



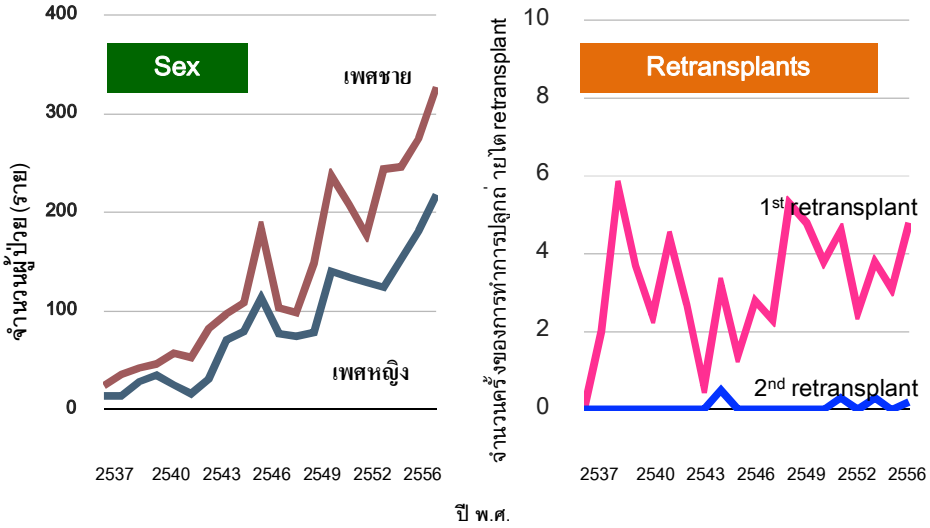
Picture 2.3 The amount and proportion of kidney transplant recipients, separated by life span.

When separated to kidney transplant category, found that the living donor has average age equal to 41.6± 2.8 years old. The recipients have been increasing in 2013 in every life span, but there were decreased in recipients under 18 years old. For the deceased donor has found that the average age equal to 43.4 ± 13.3 years old which increasing In kidney transplant recipients were aged 35-49 , 50-65 and over 65 years old when compare with 2012 as shown in picture 2.4.



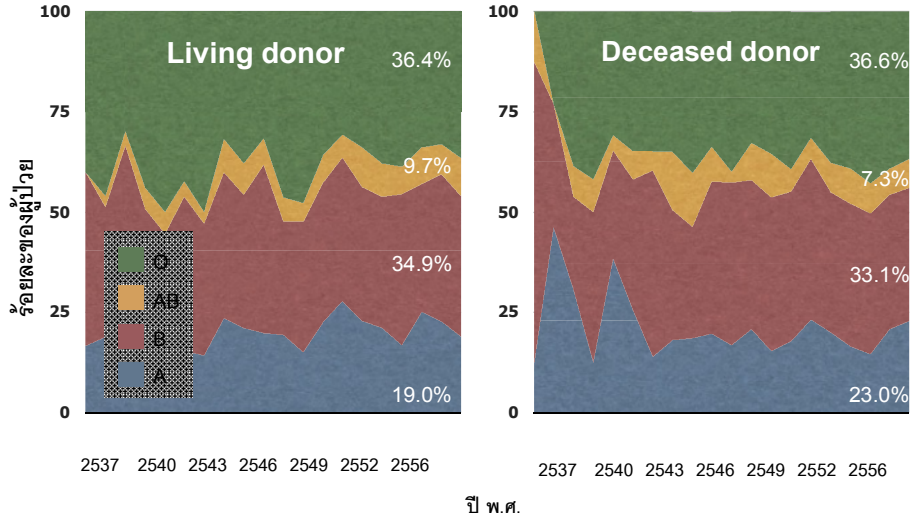
Picture 2.4 The amount of kidney transplant recipients by aged and kidney transplant categories.

There were more male than female of kidney transplant recipients and 6% less retransplantaion of kidney recipients each year when separated by sex, as shown in picture 2.5.



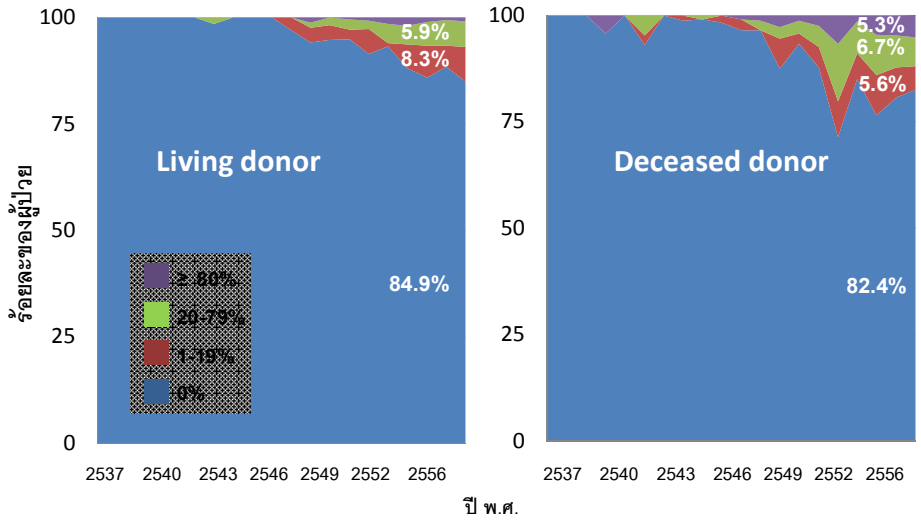
Picture 2.5 The sex kidney transplant recipients and amount of retransplantaiton of kidney transplantation.

When separated by blood types of kidney transplant recipients of living donor found that there were 36.4% of O, 34.9% were B, 19.0% were A and 9.7% were AB. For kidney transplant of deceased donor found that there were 36.6% of O, 33.1% were B, 23.0% were A and 7.3% were AB, as shown in picture 2.6.



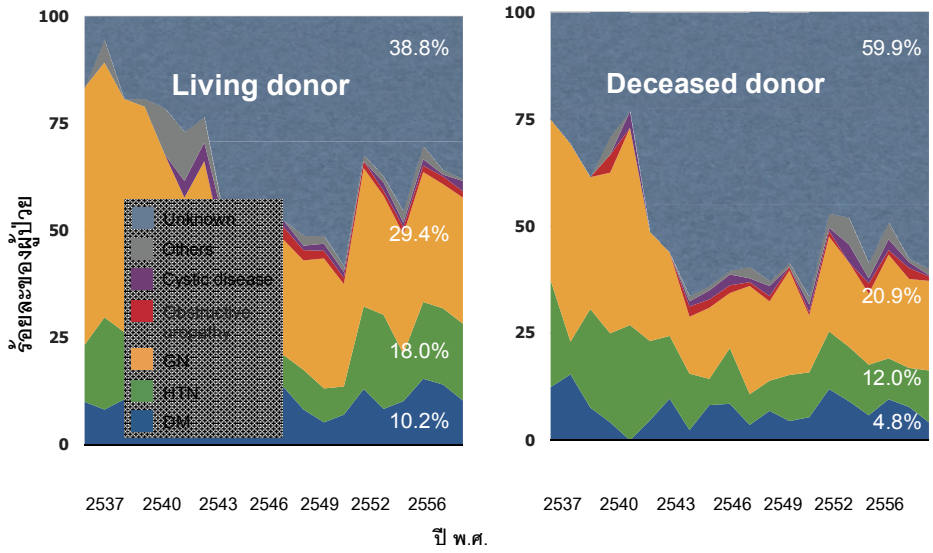
Picture 2.6 Kidney transplant recipients, separated by blood types and kidney transplant categories.

For panel reactive antibody (PRA) in 2013, the kidney transplant recipients of living donor, 84.9% has PRA equal to 0%, 8.3% has PRA between 1-1.9%, 5.9% has PRA between 20-79% and 0.9% has PRA more than or equal to 80%. For the kidney transplant recipients of deceased donor, 82.4% has PRA equal to 0%, 5.6% has PRA between 1-1.9%, 6.7% has PRA between 20-79% and 5.3% has PRA more than or equal to 80%, as shown in picture 2.7.



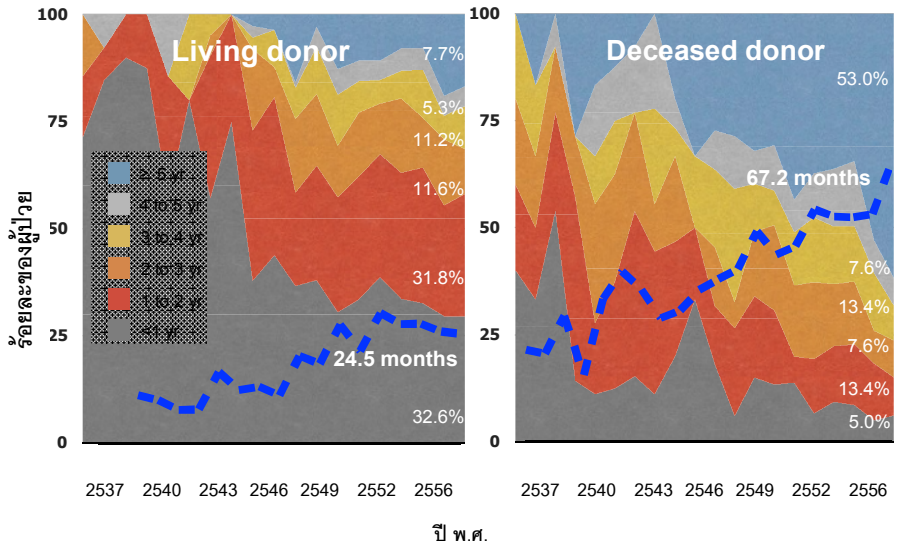
Picture 2.7 The Proportion of PRA of kidney transplant recipients by categories.

The cause of last stage of chronic kidney disease by kidney categories as shown in picture 2.8 as chronic glomerulonephritis,hypertension and diabetes are the main cause of last stage of chronic kidney disease. However, 38.8% has been received kidney from living donor and 59.9% from deceased donor recipients who did not know the cause of last stage of chronic kidney disease.



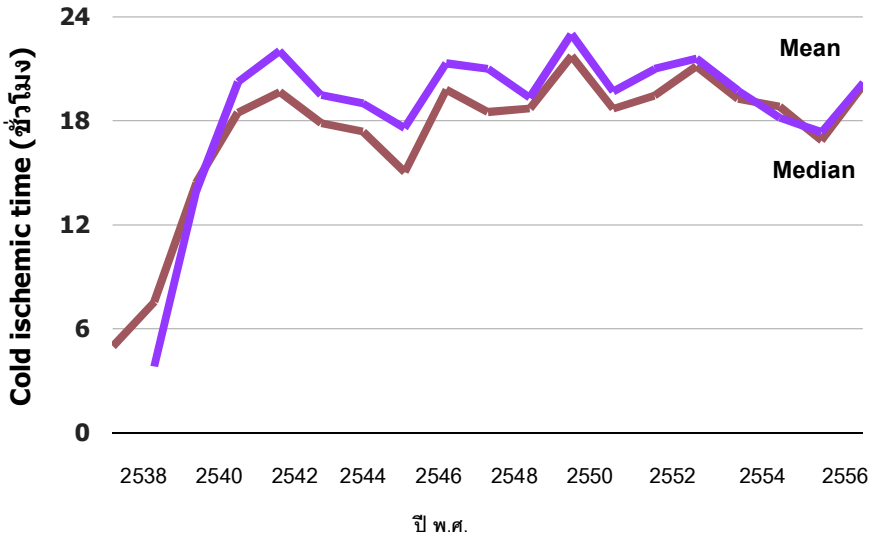
Picture 2.8 The cause of last stage of chronic kidney disease, by kidney transplant categories.

The kidney transplant of living donor has waiting time equal to 24.5 months and for deceased donor has longer waiting time when compare with last year which average to 67.2 months in 2013 as shown in picture 2.9.



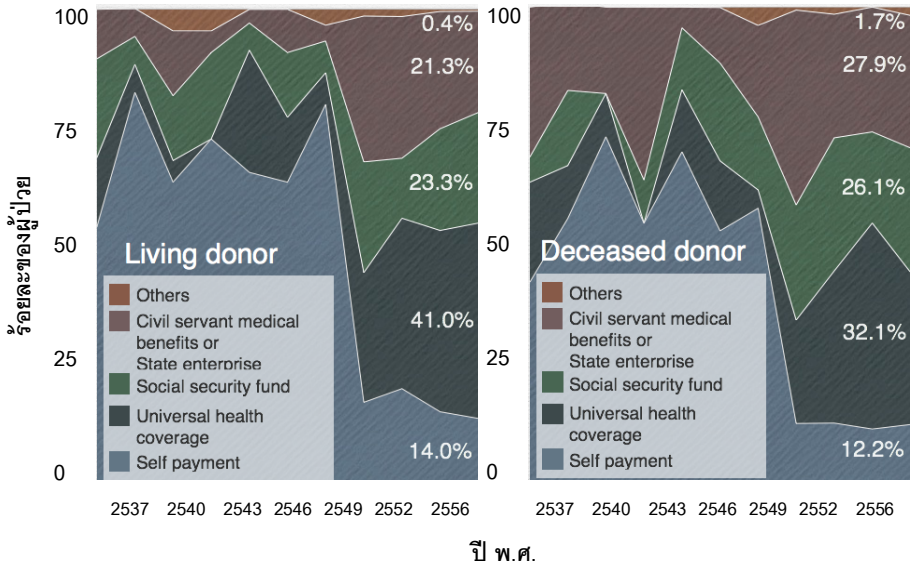
Picture 2.9 The waiting time of kidney transplant recipients by kidney transplant categories.

The average of cold ischemic time of deceased donor in 2013 equal to 20.0 $\pm$ 5.5 hours which is longer than 2012 that equal to 16.9 $\pm$ 7.1 hours as shown in picture 2.10.



Picture 2.10 Cold Ischemic Time of kidney transplant of deceased donor.

In 2013, for living donor, found that 41.0%use right ofuniversal health care, 23.3% use right of social security and 2.3% use right of government and state enterprise health care. For deceased donor found that 32.1%use right of universal health care, 26.1% use right of social security and 27.9% use right of government and state enterprise health care as shown in picture 2.11.



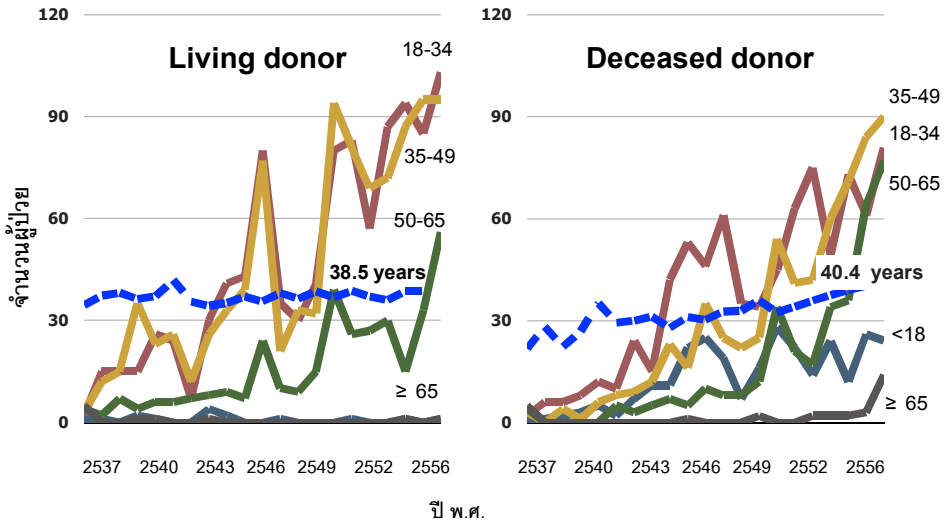
Picture 2.11 Health care right by kidney transplant by category.

In Summary of year 2013

- There were increased in amount of kidney transplantation for 18.3% which the recipients aged between 35-49 and 50-65 years old respectively.
- The main causes of chronic kidney disease are chronic glomerulonephritis, hypertension and diabetes respectively.
- The kidney transplant of deceased donor has longer cold ischemic time.
- The patients with high PRA has been increasing.
- The kidney transplant of deceased donor has longer waiting time.
- The kidney transplant recipient use right of universal health care system.

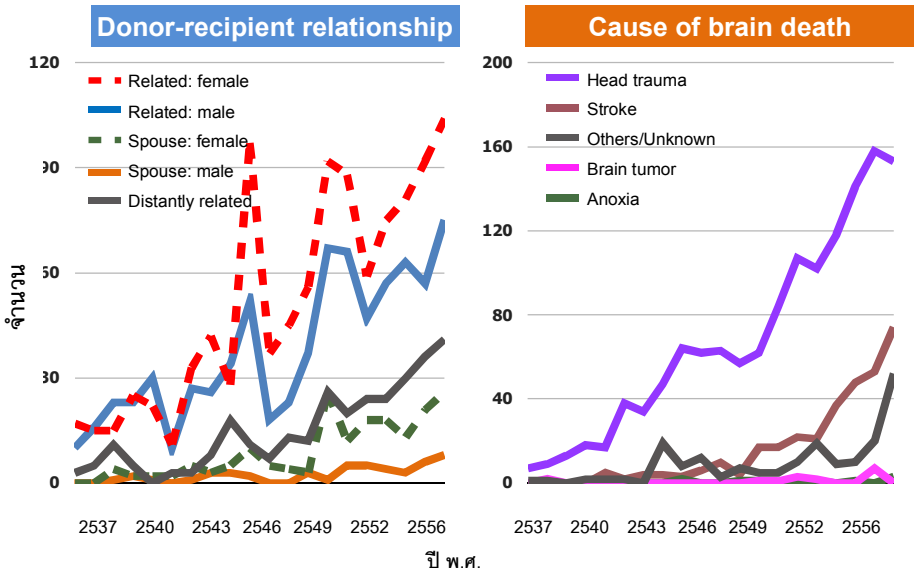
Information of Kidney Donors

In 2013, living donor and deceased donor has significantly increased. The average age of a living donor and deceased donor were 38.5 and 40.4 years old. The detail was shown in picture 2.12**.**



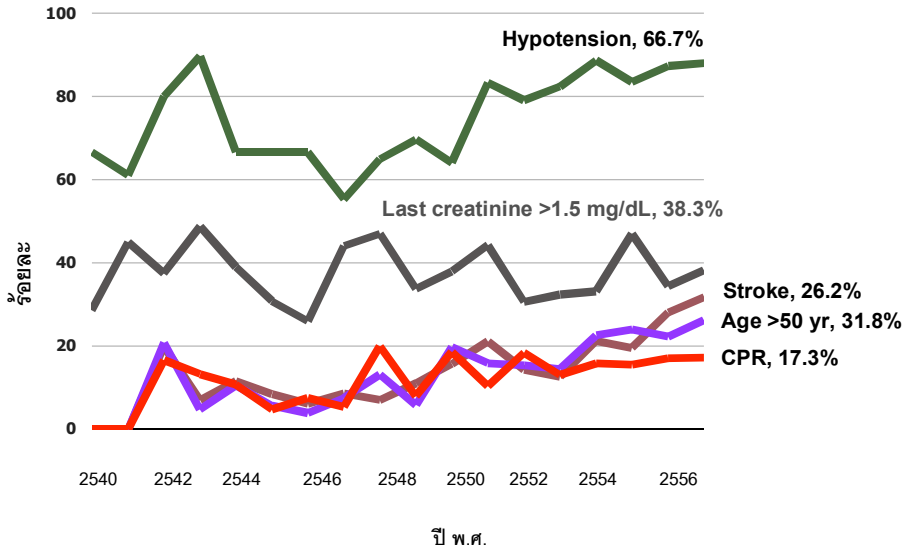
Picture 2.12 Age of donor, separated by kidney transplantation types.

Relationship between living donors and recipients were consanguinity and spouse. Deceased donors, the causes of brain death were head injury and stroke as shown in Picture 2.13.



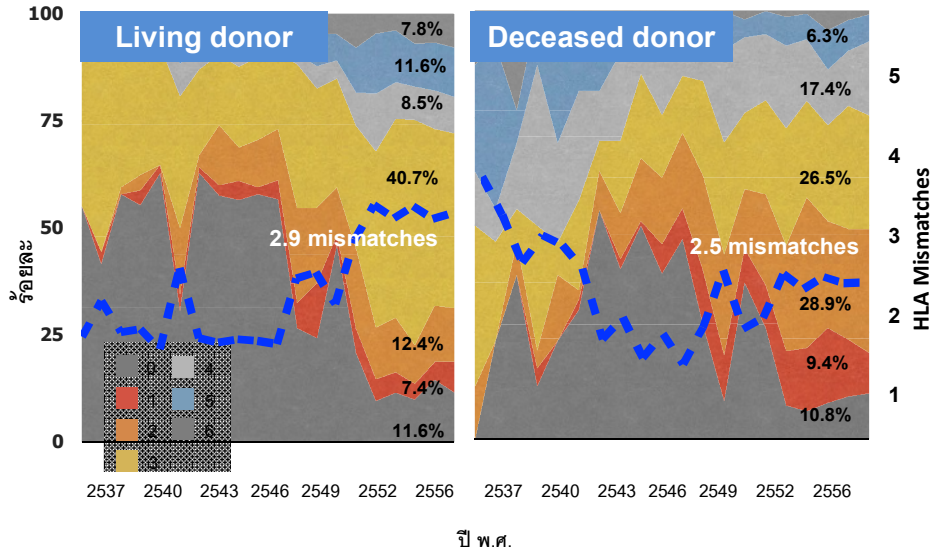
Picture 2.13 Relationship between the living donors and recipients.

There were 66.7% of deceased donors had hypotension symptom before transplant, 17.3% of them had been performed the cardiopulmonary resuscitation (CPR). 31.8% of donors who were over 50 had the serum creatinine rate, which was higher than 1.5 milligrams. And 26.2% were caused by stroke. The detail was shown in Picture 2.14.



Picture 2.14 The Qualification of Deceased donors.

The living donor and the deceased donor separated by HLA matching shown that 2.9% and 2.5 mismatches as shown in Picture 2.15.



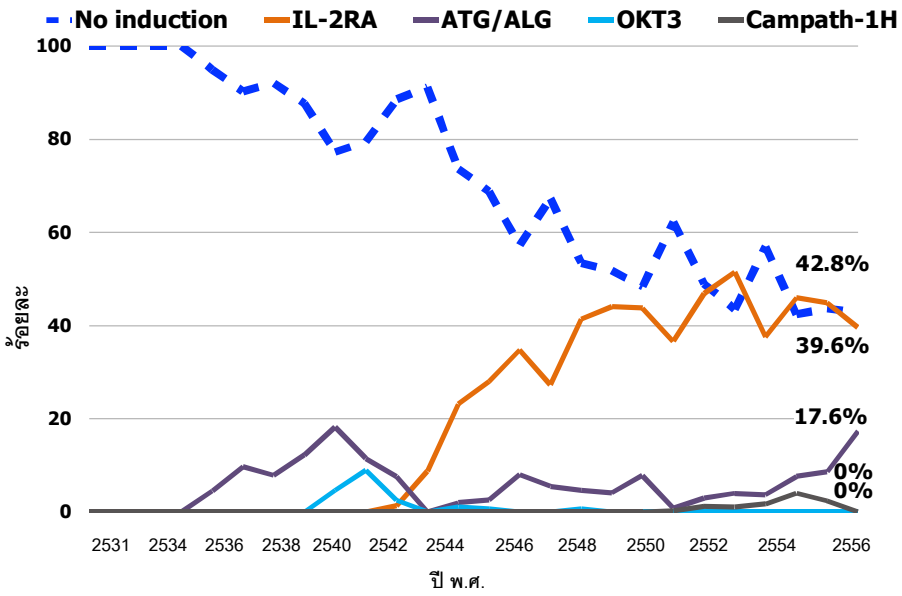
Picture 2.15 HLA mismatch, separated by transplantation types.

In Summary of kidney transplant in year 2013 found that

- Relationship between the living donors and recipients were consanguinity and spouse. Most of donors were female.
- In deceased donor, found that
    - The main causes of brain death were head injury and stroke, especially stroke has significantly increased
    - The average age of deceased donors were older than 50 years old.
    - The rate of deceased donors who had hypotension symptoms before transplant and had been performed the cardiopulmonary resuscitation (CPR) was significantly increased.

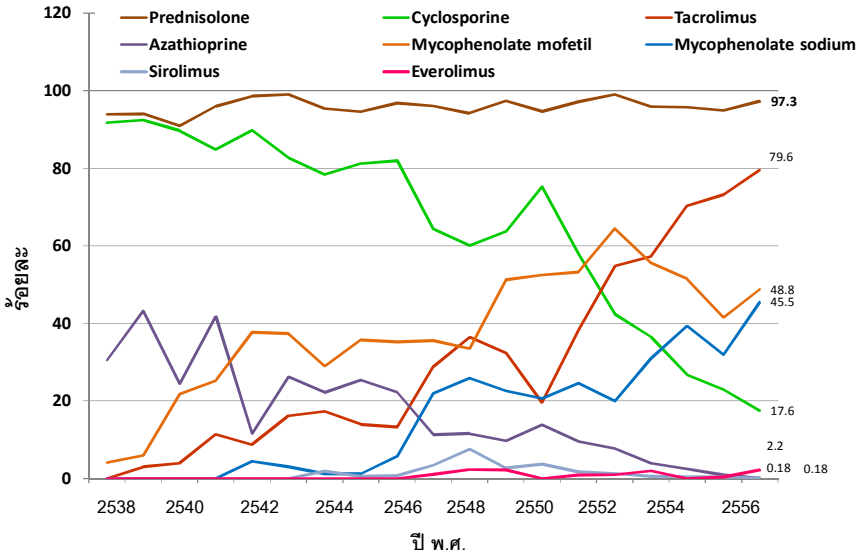
Immunoosuppressive medication

In 2013 antibody induction therapy was used 57.2%, which divided into 39.6% as interleukin-2 receptor antagonist (IL-2RA),17.6% as anti-thymocyteglobulin (ATG)/anti-lymphocyte globulin (ALG) was shown in Picture 2.16.



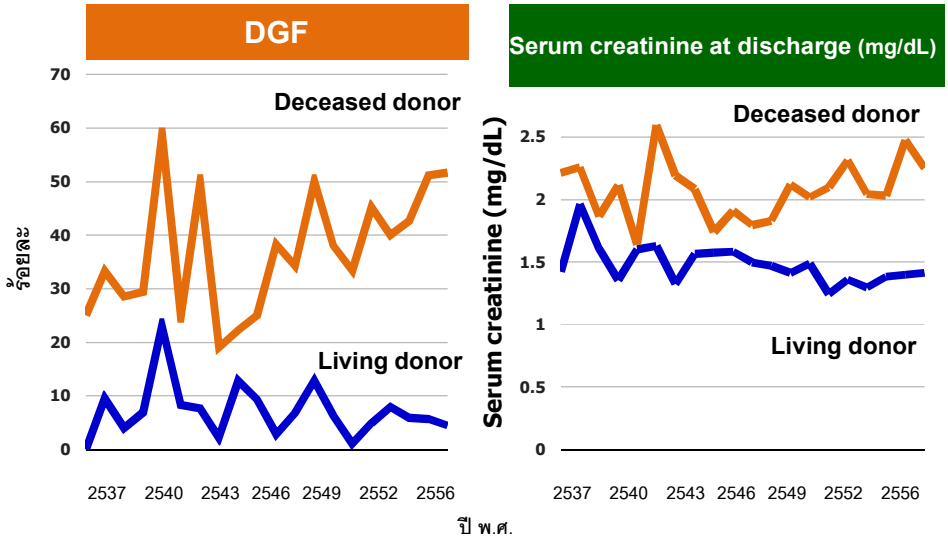
Picture 2.16 The proportion of recipients who received antibody induction therapy, separated by year of transplantation.

The Proportion and trend of immunosuppressive medication use as at the leaving date from hospital was shown in picture 2.16. In 2013, patients received prednisolone, tacrolimus, mycophenolatemofetil, mycophenolate sodium, and cyclosporine at 97.3%, 79,6%, 48.8%, 45.5%, 17.6% respectively. Less than 5% of the patients received azathioprine, sirolimus or everolimus on discharge date.



Picture 2.17 The proportion of immunosuppressive treatment on discharge date, separated by years.

The comparison between proportion of delayed graft function (DGF) after transplantation and serum creatinine level on discharge date of the recipients from the living donor and deceased donor was shown in Picture 2.18.



Picture 2.18 Delayed graft function and serum creatinine on discharge date, separated by transplant types.

Patient survival rate

The survival rate after kidney transplantation has significantly increased. In 2001, from all of the patient survival rate, the recipients from the living donors and deceased donors was shown in Table 2.2, 2.3 and 2.4 respectively,

Table 2.2 The patients survival rate of total kidney transplantation in different period of time.

Period of time	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
6 months	93.5	96.4	97.8	97.5	98.2	97.3	98.1	96.8	98.4	98.9	99.2	98.1	97.6
1 year	92.9	95.2	97.4	97.5	97.1	95.6	97.0	96.5	97.4	98.3	98.7	97.6	96.9
3 years	92.2	94.6	96.3	96.9	94.7	94.2	94.6	94.7	96.0	96.8	96.8		
5 years	90.1	90.4	94.4	93.7	92.3	92.4	93.2	93.7	93.1				
10 years	84.1	82.7	90.6	91.6									

Table 2.3 The patients survival rate of living donor recipients.

Period of time	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
6 months	98.6	100	98.1	98.2	100	99.1	98.5	99.4	99.3	98.9	99.4	99.5	99.5
1 year	98.6	97.2	98.1	98.2	100	97.3	98.1	98.9	98	98.4	99.4	99.5	99.5
3 years	97.3	95.8	96.2	96.4	97.5	96.4	96.6	97.9	96.7	96.7	97.4		
5 years	97.3	95.8	95.6	89.3	96.2	95.5	94.6	97.3	91.6				
10 years	93.2	85.8	93.6	89.3									

Table 2.4 The patients survival rate of deceased donor recipients.

Period of time	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
6 months	88.4	93.5	97.2	97.1	96.5	95.4	97.5	93.2	97.3	98.8	98.9	96.8	99.7
1 year	87.1	93.5	96.3	97.1	94.1	93.6	95.6	93.2	96.6	98.8	97.9	95.8	97.4
3 years	87.1	93.5	96.3	97.1	91.8	91.8	91.8	90.4	95.3	96.8	96.8		
5 years	84.6	85.9	92.6	96.1	88.3	89.1	91.2	88.9	95.3				
10 years	75.4	80.2	86.2	92.8									

Cause of death

The significant cause of death within the first five years and after 5 years of transplantation was shown in Table 2.5 and 2.6 respectively.

Table 2.5 The causes of death within the first five years of transplantation.

Causes of death	%
Infection	55.19
• *Septicemia*	*38.7*
• *Pulmonary infection (bacteria)*	*3.07*
• *Pulmonary infection (virus)*	*5.75*
• *Pulmonary infection (fungus)*	*3.07*
• *Pulmonary tuberculosis*	*1.92*
• *Other infections*	*2.68*
Cardiovascular disease	7.67
Hepatic disease	5.73
Cancer	2.29
Others	13.03
No Information	16.09

Table 2.6 The causes of death after 5 years of transplantation.

Causes of death	%
Infection	32.22
• *Septicemia*	*18.18*
• *Pulmonary infection (bacteria)*	*6.61*
• *Pulmonary infection (virus)*	*1.65*
• *Pulmonary infection (fungus)*	*4.13*
Cardiovascular disease	7.45
Hepatic disease	4.15
Cancer	6.61
Others	11.57
No Information	38.02

Graft Survival

The graft survival rate between recipients from the living donors and deceased donors after 2001, the detail was shown in Table 2.7, 2.8 and 2.9 respectively.

Table 2.7 Graft survival.

Period of time	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
6 months	92.9	92.9	96.0	96.9	97.1	95.5	96.2	98.2	97.0	98.3	96.7	96.5	96.1
1 year	92.9	91.0	95.3	96.9	97.1	93.7	96.0	97.9	96.4	98.0	95.9	96.5	93.8
3 years	91.5	89.2	93.8	94.3	95.9	91.4	93.7	96.4	95.0	95.8	93.2		
5 years	86.8	85.5	90.0	89.8	91.6	86.2	90.8	94.7	91.9				
10 years	71.3	78.4	80.9	79.5									

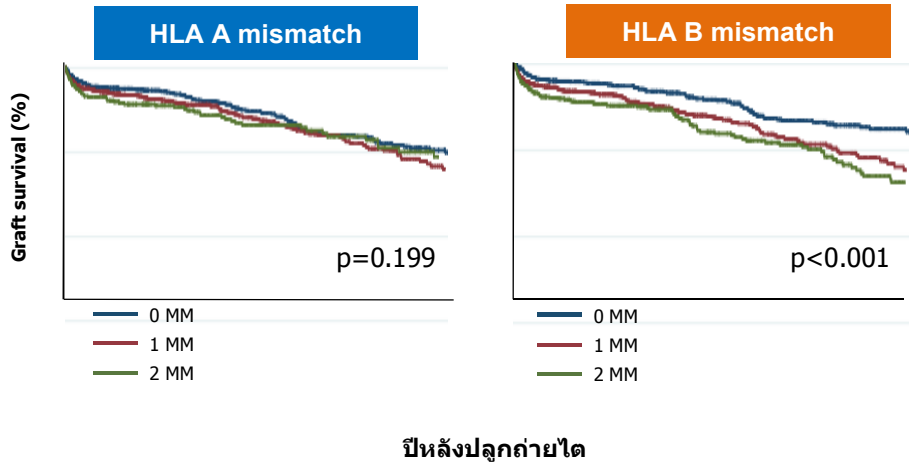
Table 2.8 The graft survival rate of living donor recipients.

Period of time	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
6 months	97.4	97.3	96.3	98.2	97.6	97.3	97.6	100	98.7	98.9	96.9	99	98.7
1 year	97.4	97.3	95.7	98.2	97.6	96.4	97.6	99.4	98.7	98.9	95.8	99	98.7
3 years	96.1	94.5	93.8	96.4	96.4	94.6	95.6	98.9	98	97.2	94.5		
5 years	90.7	94.5	91.2	92.6	94	92.8	93	97.3	94.5				
10 years	80.5	90.2	83.8	76.1									

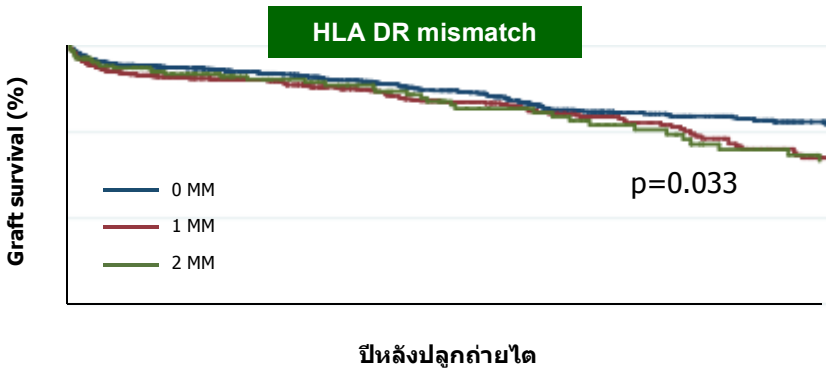
Table 2.9 The graft survival rate of deceased donor recipients.

Period of time	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
6 months	88.2	89.2	95.4	96.1	96.5	93.5	94.3	95.8	95.2	97.6	96.4	94.1	93.3
1 year	88.2	85.9	94.5	96.1	96.5	90.8	93.7	95.8	94.5	97	95.8	94.1	88.8
3 years	86.9	84.8	93.5	93.4	95.3	88	91.1	92.9	91.8	94.1	91.4		
5 years	82.9	78.3	86	88.1	89.2	79.3	87.7	91.2	89				
10 years	62.1	68.9	76.6	80.9									

The comparison of graft survival, separated by HLA matching shown that HLA mismatch had no impact on graft survival but HLA –B and HLA-DR mismatch had impact on graft survival, the detail was shown in Picture 2.19 and 2.20.

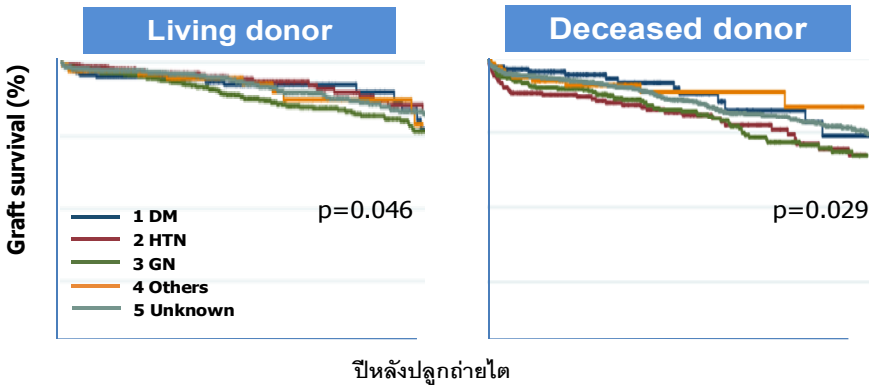


Picture 2.19 The graft survival separated by HLA-A and HLA-B mismatch.



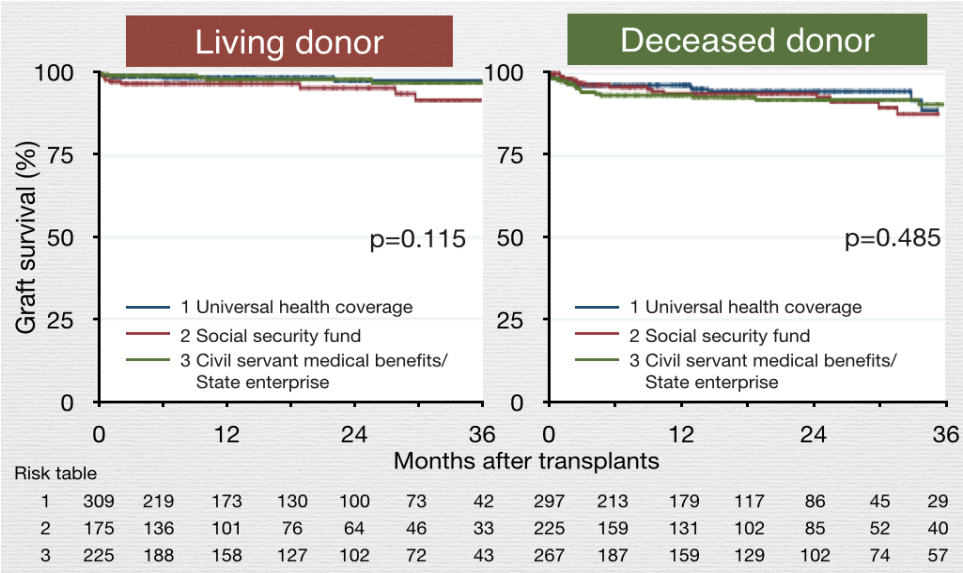
Picture 2.20 The graft survival, separated by and HLA-DR mismatch.

The comparison of the graft survival by cause of chronic kidney disease condition. The detail was shown in Picture 2.21.



Picture 2.21 The graft survival rate, separated by cause of chronic kidney disease condition.

Graft survival rate, separated by medical eligibility was not found difference between kidney transplant from the living donor and deceased donor. The detail was shown in picture 2.22.



Picture 2.22 The graft survival rate, separated by medical eligibility.

Kidney transplant 2013 Summary

- Antibody induction therapy was used 57.2%, comparing to the past proportion of antibody induction has significantly increased.
- Immunosuppressive medication use as at the leaving date from hospital, 79.6% of tacrolimus was used by calcineurin inhibitor group. 48.8% of mycophenolate mofetil and 45.5% of mycophenolate sodium were used by antiproliferative.
- More than 50% of the patient survival who recipients from deceased donors were found delayed graft function.
- Infection was big cause of death.
- The survival rate and graft survival rate, comparison between the past and the present has significantly increased.
- Except delayed-graft-function patients at the discharge date, the serum creatinine rate, which was higher than 2 milligrams per deciliter and HLA-DR mismatch. Also HLA-B mismatch was impact for graft survival.

Information of kidney transplantation recipients under 18 years old

Kidney Transplantation for patients under 18 years old

Amount of kidney transplant recipients under 18 years old in 2013

From Jan, 1 to Dec, 31 2013, there were 25 patients of kidney transplant recipients under 18 years old, 4 recipients from living donors and 21 recipients from deceased donors, separated by hospitals. The detail was shown in table 3.1.

Table 3.1 Number of kidney transplant recipients under 18 years old in 2013, separated by hospitals.

Hospital Name	Kidney transplant from living donor	Kidney transplant from deceased donor	Total
Ramathibhodi	0	9	9
Phramongkutklao	1	4	5
SrinakarinKhonKaen	0	4	4
Siriraj	2	1	3
Chulalongkorn	1	0	1
BhumibolAdulyadej	0	1	1
Chiang Mai	0	1	1
Sapphasitprasong	0	1	1
Total	**4**	**21**	**25**

The comparison between numbers of kidney transplant recipients under 18 years old in 2012. In 2013 kidney transplant of recipients has decreased by 37.8%. Recipients from the living donors was decreased by 50%. And recipients from deceased donor was decreased by 34.5%.

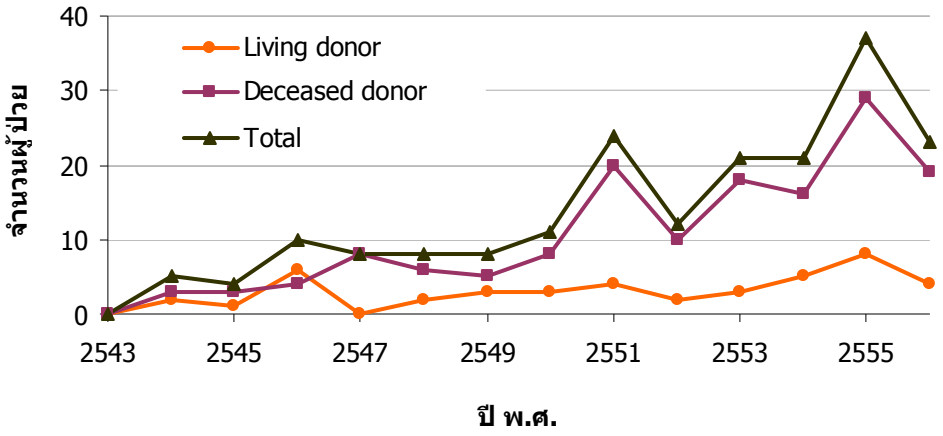


Table 3.1 Number of kidney transplantation per year since 2000, separated by transplantation types.

Information of kidney transplant recipients and donors under 18 years old in 2013.

In 2013, from 25 of kidney transplant recipients under 18 years old, there were 4 patient recipients from living donors. Of these, 75% of recipients were male. 25% of living donors were male and age of recipients were 13.2 ± 3.0 years old. In this regard, 100% of recipients received first transplantation and 75% received hemodialysis before transplantation.

Table 3.2 Information of kidney transplant recipients under 18 years old received from living donors.

	Recipient	Donor
Male gender, %	75.0	25.0
Age (mean ± SD), years (range)	13.2±3.0 (10 – 17)	37.0 ± 12.2 (19 – 46)
Number of transplant, %		
1	100.0	
Mode of renal replacement therapy, %		
Hemodialysis	25.0	
Peritoneal dialysis	75.0	

SD: standard deviation

From 21 recipients from deceased donors as shown in Table 3.3, 73.7% were male. 89.5% of deceased donors were male. Age of recipients were 14.5 ± 2.7 years old. 100% of recipients received first transplantation and 68.4% received hemodialysis before transplantation.

Table 3.3 Information of kidney transplant recipients under 18 years old received from deceased donors.

	Recipient	Donor
Male gender, %	73.7	89.5
Age (mean ± SD), years (range)	14.5 ± 2.7 (6 – 17)	30.2 ± 12.9 (8 – 50)
Number of transplant, %		
1	100.0	
Mode of renal replacement therapy, %		
Hemodialysis	31.6	
Peritoneal dialysis	68.4	

SD: standard deviation

Immunosuppressive medication use and kidney transplant recipients under 18 years old outcomes for year 2013

In 2013, 82.6% of 25 kidney transplant patients received immunosuppressive medication. The information of immunosuppressive formula at the discharged date from hospital. As shown in Table 3.4 and 3.5, indicated that tacrolimus, mycophenolate mofetil, and prednisolone were most used.

Table 3.4 Kidney transplant recipients under 18 separated by induction therapy.

Induction therapy	N (%)
No induction	4 (13.1)
Basiliximab	19 (82.6)
Antithymocyte globulin	2 (4.3)
Total	**25 (100)**

Table 3.5 Information of Immunosuppressive regimen as at the date of leaving hospital.

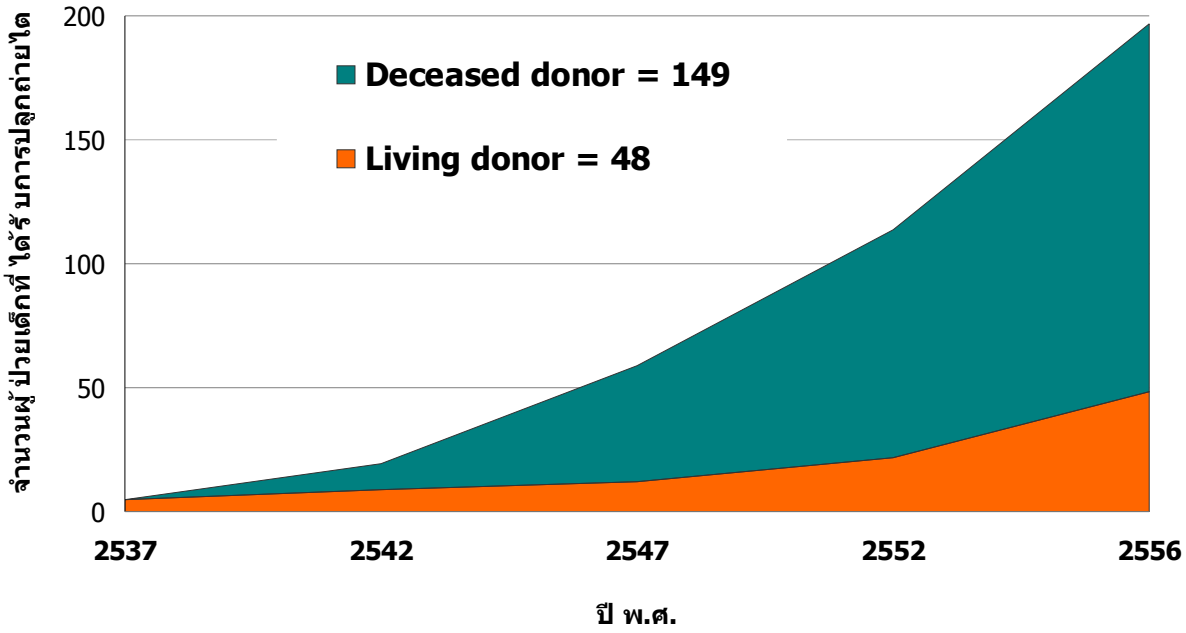
Immunosuppressive regimen	N (%)
Tacrolimus + mycophenolate mofetil + prednisolone	19 (73.91)
Tacrolimus + mycophenolate sodium + prednisolone	4 (17.39)
Tacrolimus + prednisolone	1 (4.35)
Cyclosporine + mycophenolate mofetil + prednisolone	1 (4.35)
Total	**25 (100)**

In 2013, the survival rate of living donor transplant and deceased donor transplant patients at 1 year after kidney transplantation were 100% and 100% respectively. The graft survival rate in the first year were 100% and 100% respectively.

Information of kidney transplant recipients under 18 years old since 1994

Number of kidney transplant recipients under 18 years old per year since1994 and kidney transplantation.

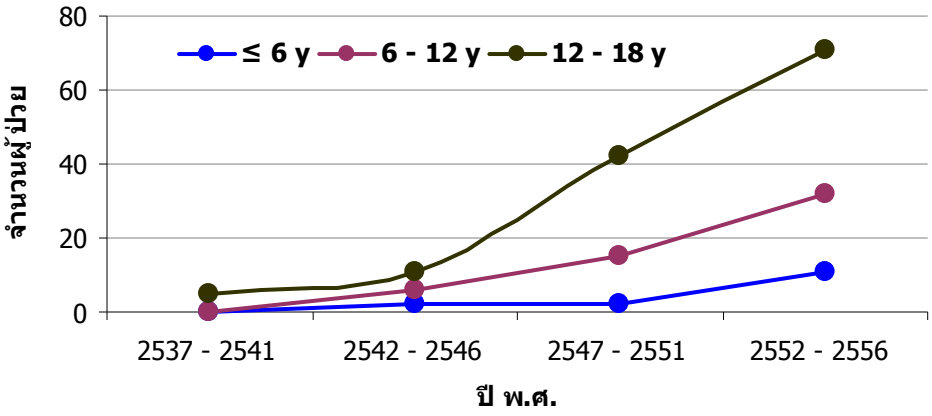
From the report based on the data by Thai Transplantation Society, there were 197 recipients under 18 years old, which divided into 48 recipients from living donor and 149 recipients from deceased donor. (The detail was shown in picture 3.2).



Picture 3.2 Number of kidney transplant recipients under 18 years old per year since 1994 and kidney transplant types.

Analysis of kidney transplant information from 1994 – 2013

The report based on the data, there were 197 recipients under 18 years old, 55.8% were male. The average of age of transplant occurrence was 12.9 ± 4.1 years old. As shown in Picture 3.3 number and proportion of recipients under 18 years old, 99% of all recipients were received first transplantation and 54.8% received hemodialysis before transplantation. On the donor side, 69.5% were male. The main age at the donation occurrence were 33.4 ± 12.3 years old. The details were as shown in table 3.6.



Picture 3.3 Number and proportion of recipients under 18 years old, separated by ages.

Table 3.6 Information of kidney transplant recipients under 18 years old.

	Recipient	Donor
Male gender, %	55.8	69.5
Age (mean ± SD), years (range)	12.9 ± 4.1 (0 – 17)	33.4 ± 12.3 (3 – 58)
Number of transplant, %		
1	99	
2	1	
Mode of renal replacement therapy, %		
Preemptive	3.6	
Hemodialysis	34.0	
Peritoneal dialysis	54.8	
Missing	7.6	

SD: standard deviation

The most common causes of chronic renal failure were chronic glomerulonephritis, lupus nephritis, lupus nephritis, IgA nephropathy, FSGS and others which represented 12.7%, 4.1% 3%, 2.5%,2% and 16.8%, respectively. Unidentified cause accounted for 58.9% of total patients.

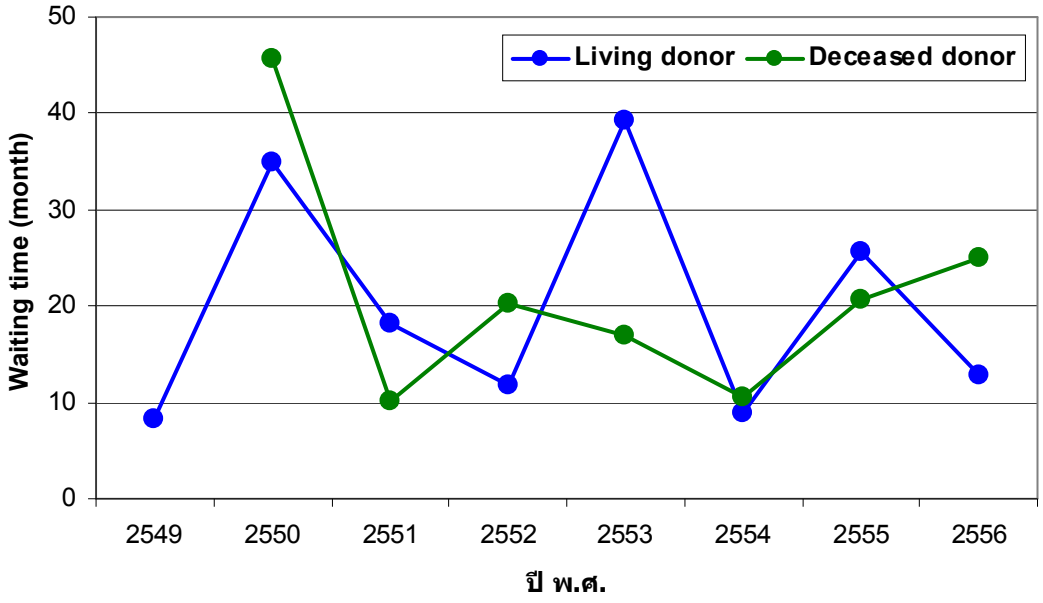
The comparison between the living donors and deceased donors were shown in Table 3.7. With reference to that information, totaling 197 cases, there were 48 cases received from living donors and 149 cases received from deceased donors.

Table 3.7 Information of recipients from living donors and deceased donors

	Kidney transplant from Living donor	Kidney transplant fromDeceased donor
Number	48	149
Recipient age, year	13.0 ±3.4	12.9 ± 4.3
Donor age, year	38.7 ± 8.0	31.8± 13.0
Waiting time, month (IQR)	17.8 (7.4 – 34.8)	18.8 (10.5 – 28.9)
Median HLA mismatch (IQR)	2 (1 – 3)	3 (2 – 4)
Median PRA (P_5-P_{95}), %	0 (0 – 16.3)	0 (0 – 0)
Payment type, %		
Governmental	12.50	5.37
Social Security	0	0.67
Uninversal Health Coverage	29.17	51.68
State Enterprise/SAO/PAO/Private Sector	2.08	2.01
Self-Affordability	8.33	2.68
others	47.92	37.58

HLA, human leukocyte antigen; IQR, interquartile range; PRA, panel reactive antibody; P_5, 5th percentile; P_{95}, 95th percentile

Since 2009, deceased donor recipients have to wait longer when considering the duration renal replacement therapy before kidney transplantation (picture 3.4). On the other hand, waiting time of living donor recipients have not been varied. For 2013, renal-replacement-therapy duration of recipients from living donor and deceased donor were12.8 months and 25 months, respectively.



Picture 3.4 The duration of renal replacement therapy before kidney transplantation, separated by donor types.

Information of Donor

From 48 living donors, 41.7% were male, donors had relationship with recipients as shown in Table 3.9.

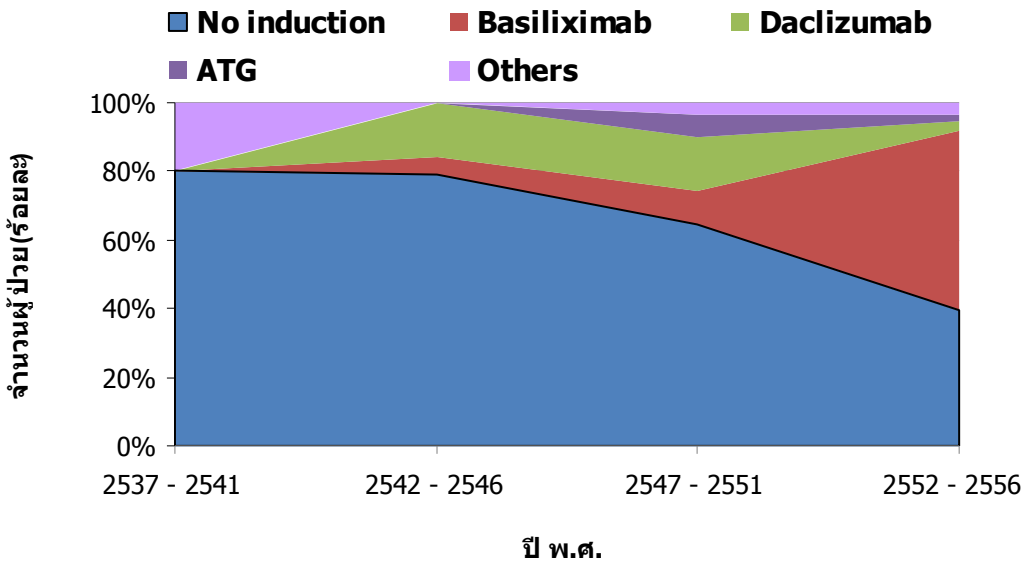
Table 3.9 Relationship between living donors and recipients.

Relationship	Number of living donor (%)		
	Male	Relationship	Male
Parents	11 (22.9)	Parents	11 (22.9)
Siblings	2 (4.2)	Siblings	2 (4.2)
Others (ex. Cousin, Blood relation)	7 (14.6)	Others (ex. Cousin, Blood relation)	7 (14.6)
Total	**20 (41.7)**	**Total**	**20 (41.7)**

From 149 deceased donors, 78.5% were male. The causes of brain death were car accident, cerebrovascular accident, and others; for example; falling accident, gun accident. The percentage of which were 67.1%, 13.4%, and 16.1%, respectively, while the remaining 3.4% could not identify the cause. 75.8% of deceased donors had hypotension symptom before transplant, 12.8% of them had been performed the cardiopulmonary resuscitation (CPR).

Immunosuppressive medication use and kidney transplant outcome.

Antibody induction therapy has been used in young patients cases has significantly increased. (Picture 3.5)



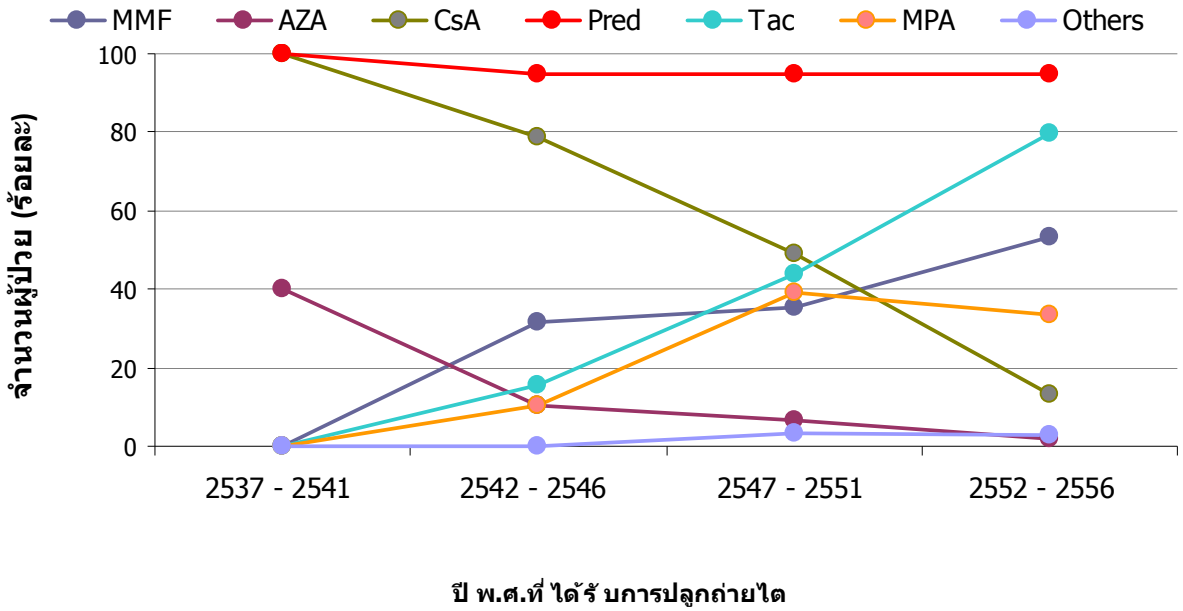
Picture 3.5 The proportion of recipients who received antibody induction therapy, by year of transplantation.

The Proportion of antibody induction therapy from 1994 – 2013, which were separated by type of kidney transplant were shown in table 3.10. The data was separated into 48 recipients from living donors and 147 recipients from deceased donors.

Table 3.10 The proportion of antibody induction therapy, by type of kidney transplantation.

	Number of recipients (%)	
	Living donor (N=48)	**Living donor (N=48)**
No induction	29 (60.4)	72 (49.0)
OKT3	1 (2.1)	0 (0)
ATG/ALG	1 (2.1)	5 (3.4)
IL-2R antagonist	14 (29.2)	67 (45.6)
Others	3 (6.2)	3 (2.0)

Proportion and trend of immunosuppressive medication use as at the leaving date from hospital was shown in picture 3.6. The patients under 18, patients received prednisolone, tacrolimus, mycophenolate, mofetil, mycophenolate sodium has significantly increased.



Picture 3.6 Proportion of immunosuppressive treatment on discharge date, separated by years.

For blood types of recipients from living donors, type O, B, A and AB which represented 29.17%, 39.58%, 20.83% and 8.33% respectively. On the other hand, blood types of recipients from deceased donors, the percentage was 38.93%, 40.27%, 14.77% and 5.37% respectively

The table 3.11 was shown the comparison between proportion of delayed graft function after transplantation and serum creatinine level on discharge date of the recipients from living donors and deceased donors.

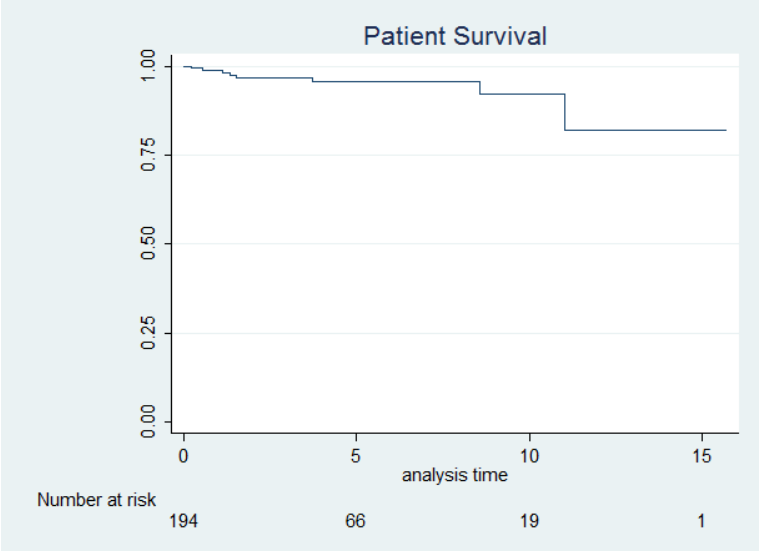
Table 3.11 Proportion of delayed graft function and serum creatinine level on discharge date of the recipients, separated by transplant types.

	Kidney transplant from Living donor	Kidney transplant from Deceased donor
Delayed graft function, %	4.87	27.40
Serum creatinine at discharge, mg/dL	1.07 ± 0.77	1.35 ± 0.95

Patient survival rate

In the past 20 years, the survival rate after kidney transplant has significantly increased. During 1994 – 2013, 8 patients died after kidney transplantation which was 4.1%. Causes of death were 2 cases of Septicemia which divided into 1 case of pulmonary infection (virus) and 1 case of pulmonary infection (fungus), others was 1 case and No Information were 3 cases.

The patient survival rate after 1 year and 5 years were 95.5% and 93.3%, respectively (Picture 3.7).

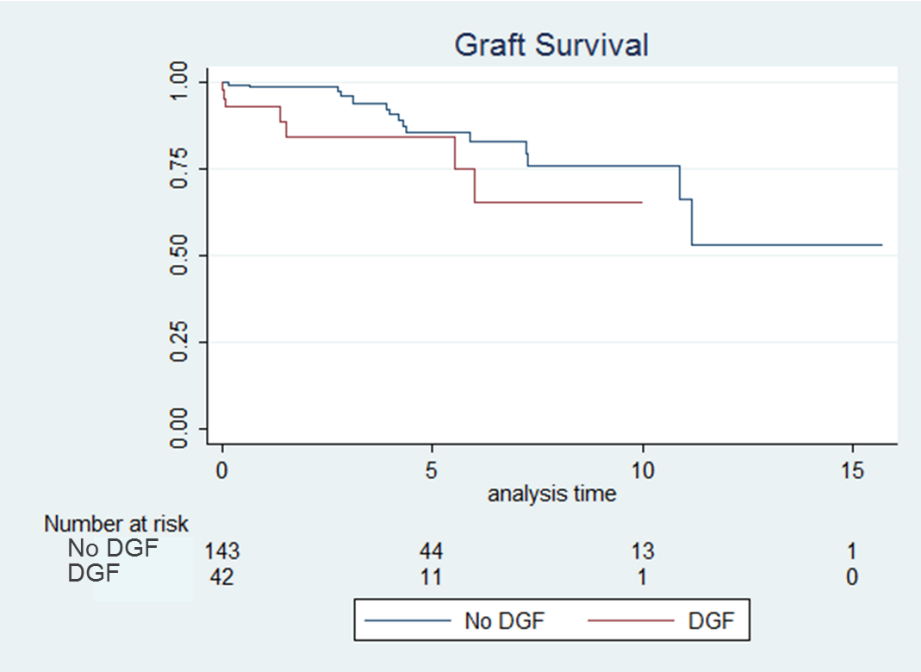


Picture 3.7 The proportion of kidney transplant recipients under 18 years old.

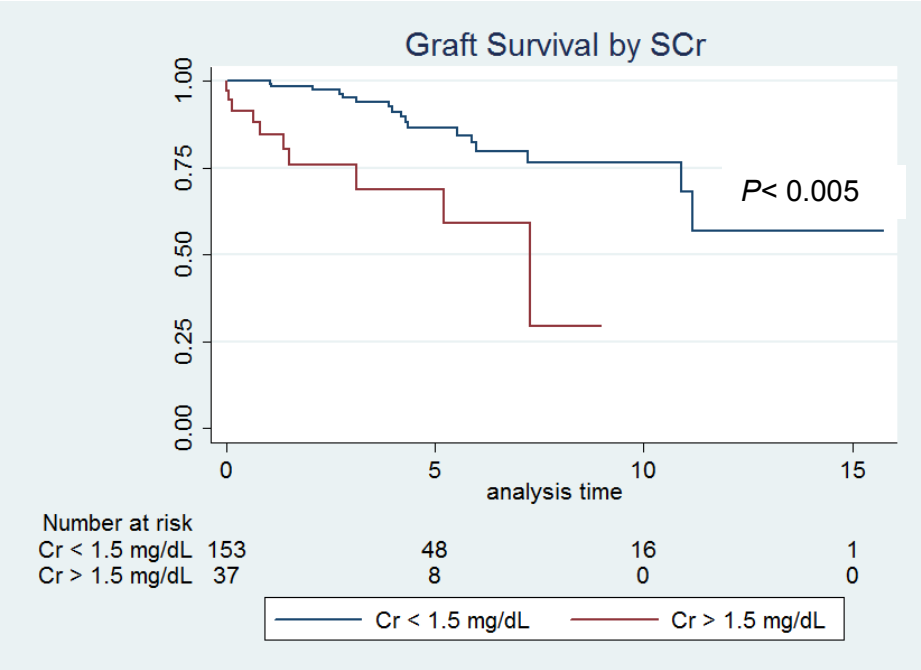
Graft survival

During 1994 – 2013, there were 28 cases which lost kidneys, the cause were chronic renal allograft dysfunction, recurrent of primary disease, acute rejection, withdrawal immunosuppression nonadherance, renal artery stenosis and others which represented 11, 4, 3, 3, 3 and 6 cases respectively.

For the delayed-graft-function patients, the graft survival rate was significantly lower than non-delayed-graft-function patients. (As shown in picture 3.8). At the discharge date, the serum creatinine rate, which was higher than 1.5 milligrams per deciliter, resulted in the lower graft survival rate of living donor than the patients who have lower-than-1.5 milligrams per deciliter serum creatinine rate. (The detail was shown in picture 3.9).



Picture 3.8 The graft survival rate, separated by delayed graft function (DGF).



Picture 3.9 The graft survival rate, separated by the serum creatinine rate as at the date of leaving hospital.

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