



# Paired Exchange Results

## Quarterly Report

As of June 30, 2017

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## Message from the Founder

We are pleased to report that we facilitated 207 transplants in the first half of 2017, up 11% over the 186 transplants completed in the first half of last year.

With the continued success of the Center Liquidity Contribution (CLC) program, we are thrilled to report that we have no matchable pairs as of 8/1/17 waiting more than 12 months at centers with CLC scores > 0. Centers that enroll NDDs and favorable blood type compatible and incompatible pairs will continue to see wait times drop for their patients as a direct result of their center's liquidity contribution.

Patients transplanted via NKR facilitated swaps continue to show graft survival and patient survival advantages at 1, 3 and 5 years compared with all U.S. living donor transplants. The better outcomes from NKR facilitated KPD transplants are helping compatible pairs better understand the advantages of participating in NKR swaps which result in better matched kidney. Better matches are correlated with improved graft survival and longer lasting kidney transplants. Compatible pair participation in NKR swaps is up 70% over last year.

Our online donor intake systems continue to expand in volume and functionality. By the end of the second quarter, across all of our donor intake platforms, we were processing approximately 15,000 donor contacts per year. Our private label donor intake system (DASH) is now live at 10 centers and is handling 6,000 donor candidate contacts per year.

New donor intake functionality, implemented this past quarter, focused on process improvements suggested by our DASH users. These improvements are enhancing usability and further streamlining all aspects of the donor intake process. Our next major enhancement will create an automated process for shipping 24-hour urine collection jugs to donor candidates, providing an option for donor candidates to complete pre-workup tests at local labs before referral to a transplant center. This enhancement will reduce unqualified NKR referrals by screening out donor candidates who do not wish to complete the testing required for kidney donation surgery.

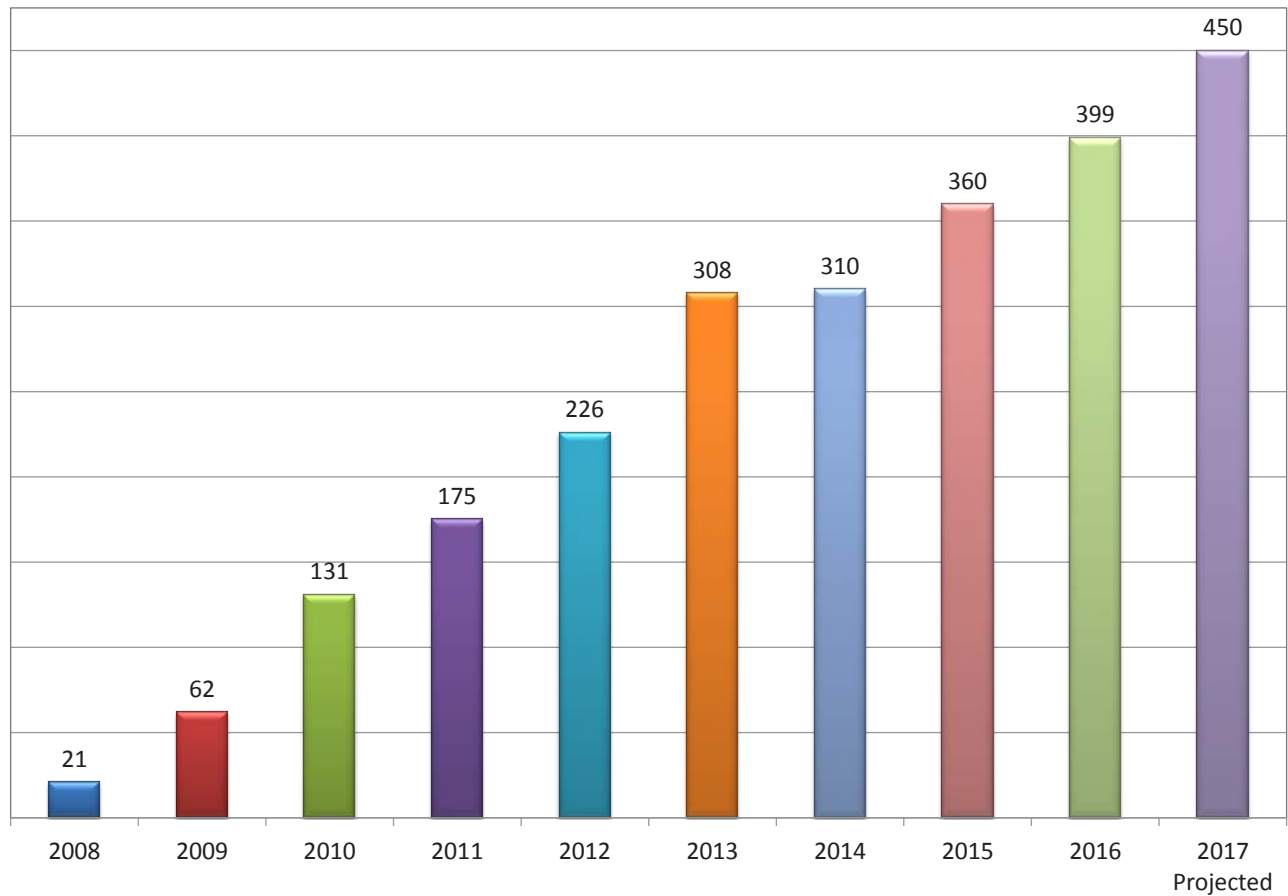
It is the ongoing dedication and effort of our Member Centers that enables us to continue breaking records and achieving new milestones. Thank you for your support and keep up the great work.

Sincerely,

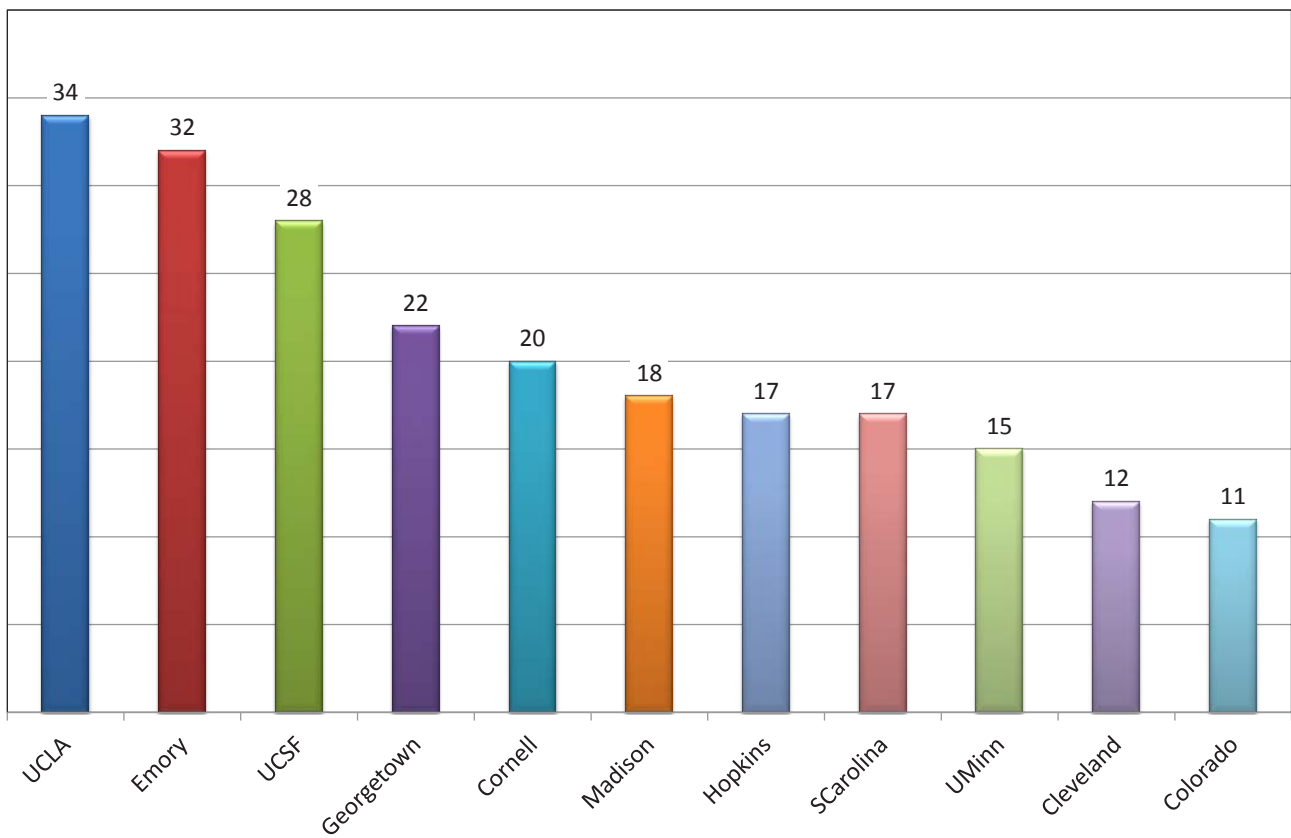
A handwritten signature in blue ink, appearing to read 'G. Hil', with a long, sweeping horizontal stroke extending to the right.

Garet Hil  
Founder & CEO  
National Kidney Registry

# Transplants Facilitated

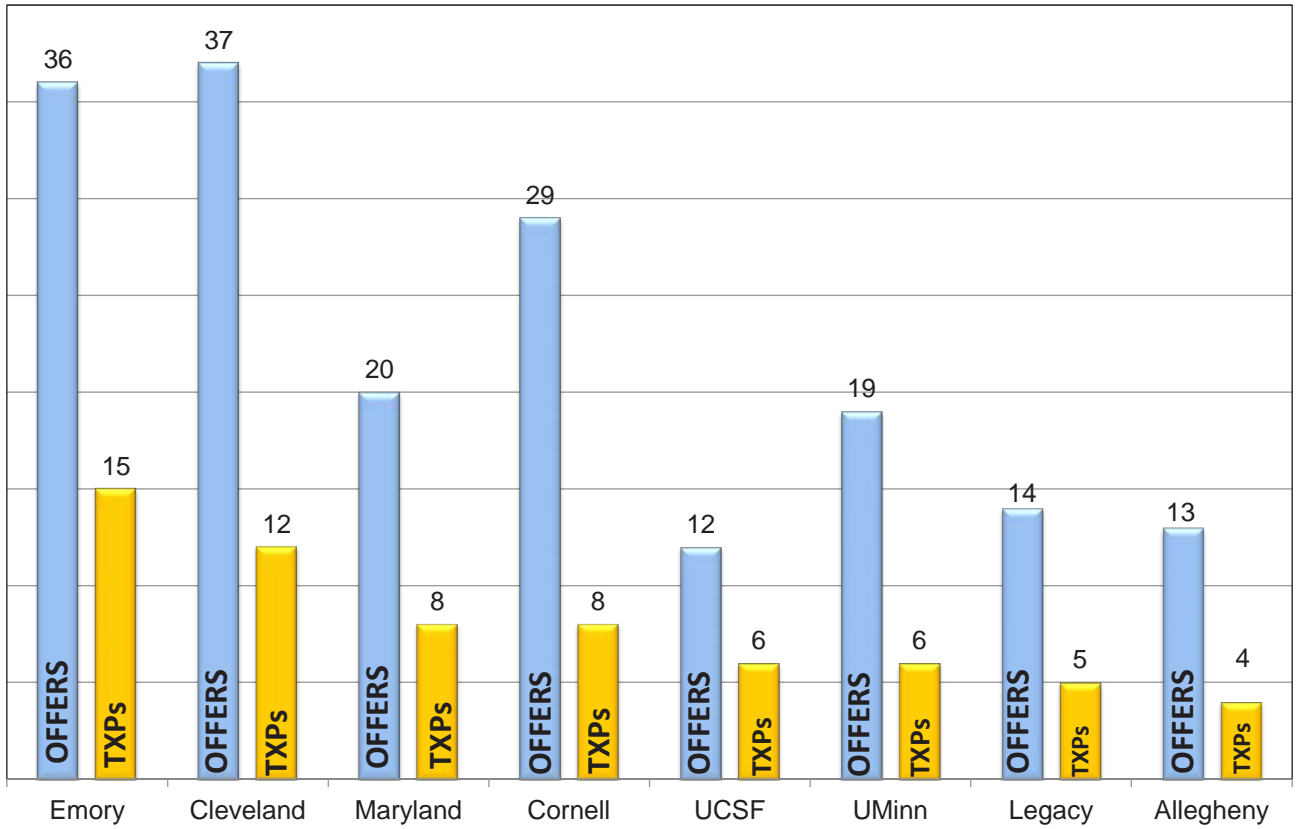


# Top Centers Transplants Last 12 Months

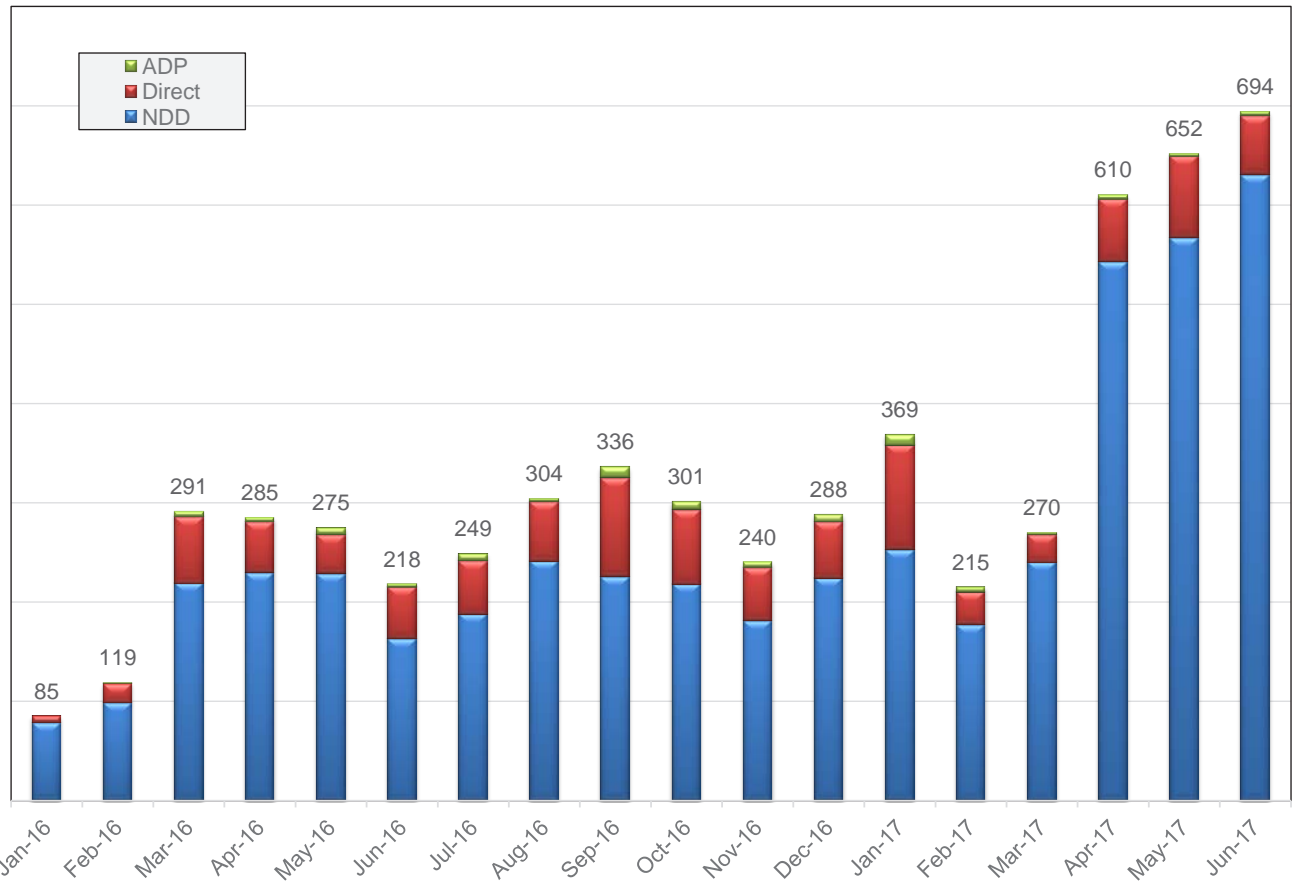


# Top Center Liquidity Contributors

CLC Driven Match Offers - 4/15 - 6/17

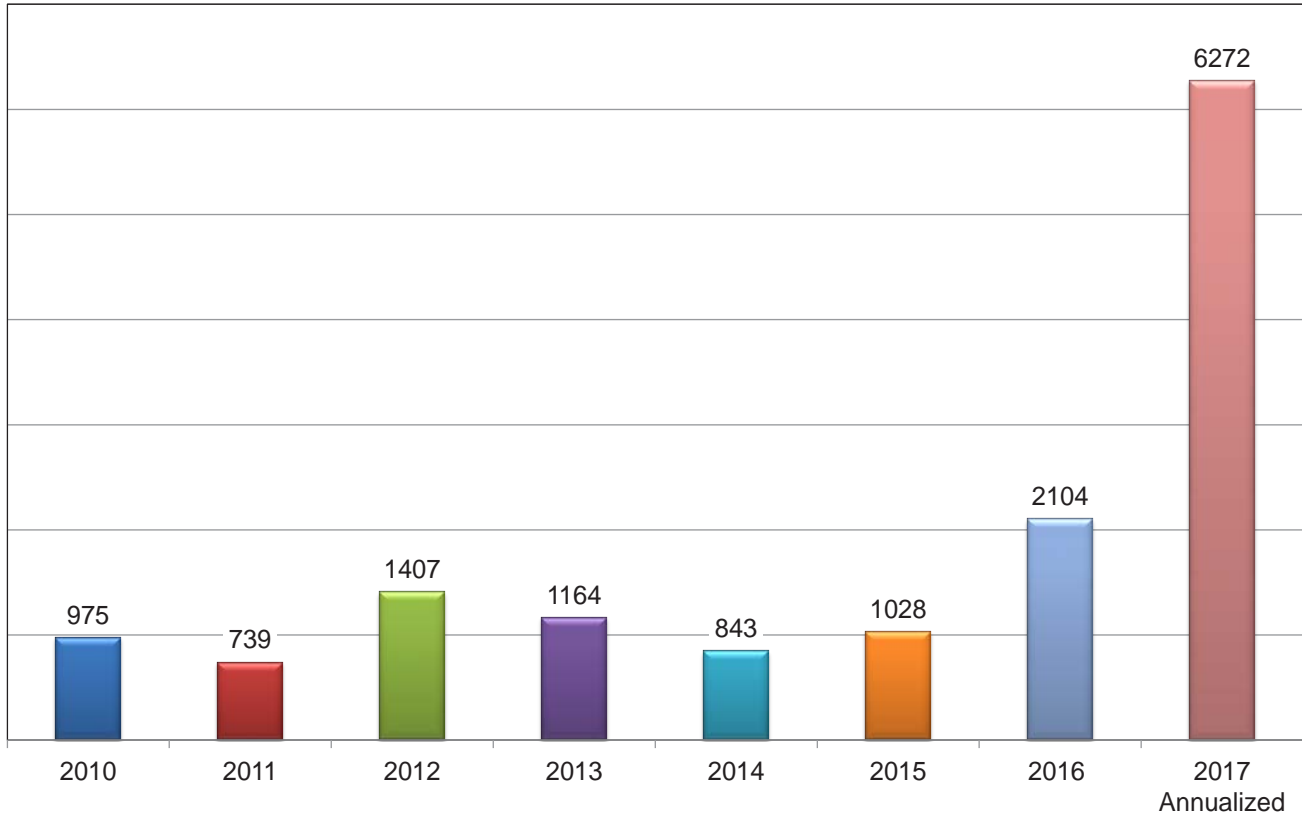


# Donor Contacts



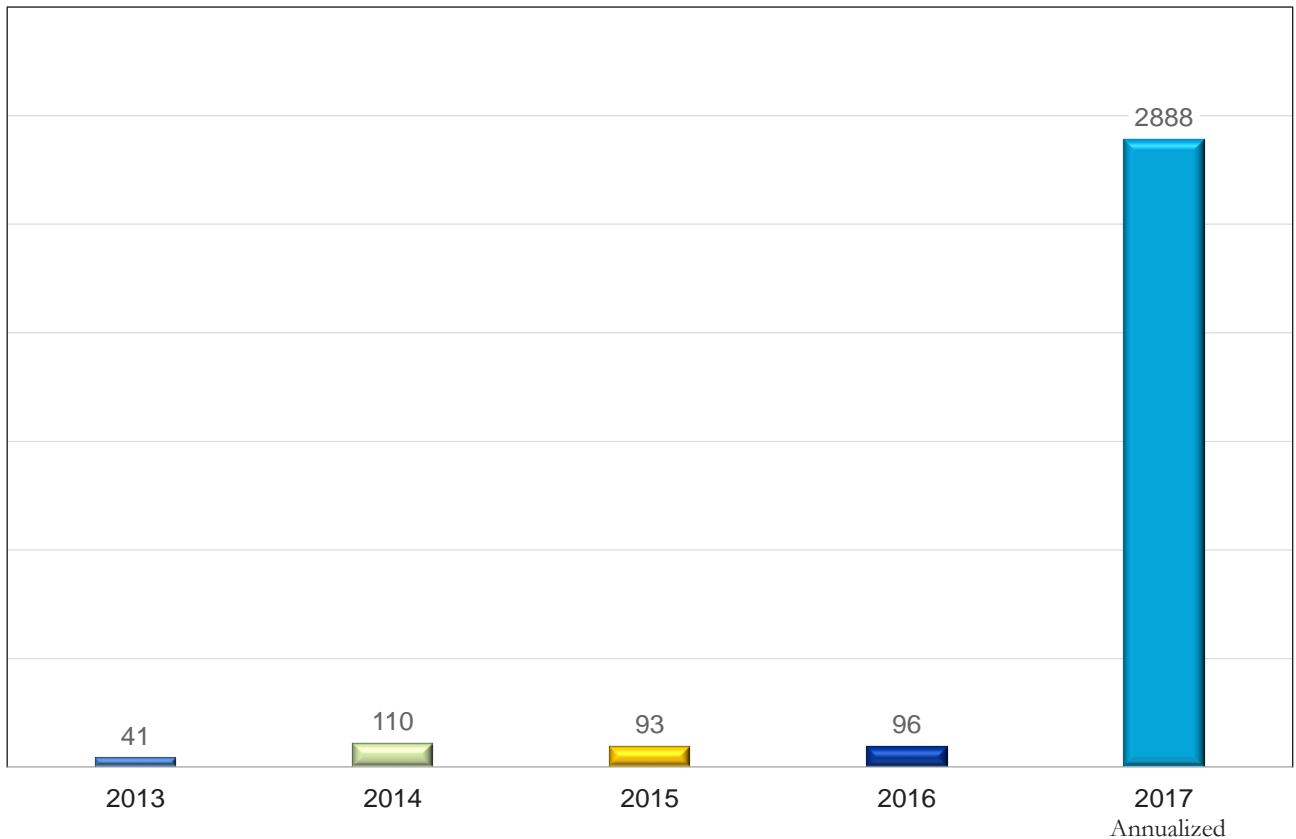
# Non-Directed Donor Contacts

Via NKR Donor Intake Platform



# Non-Directed Donor Referrals

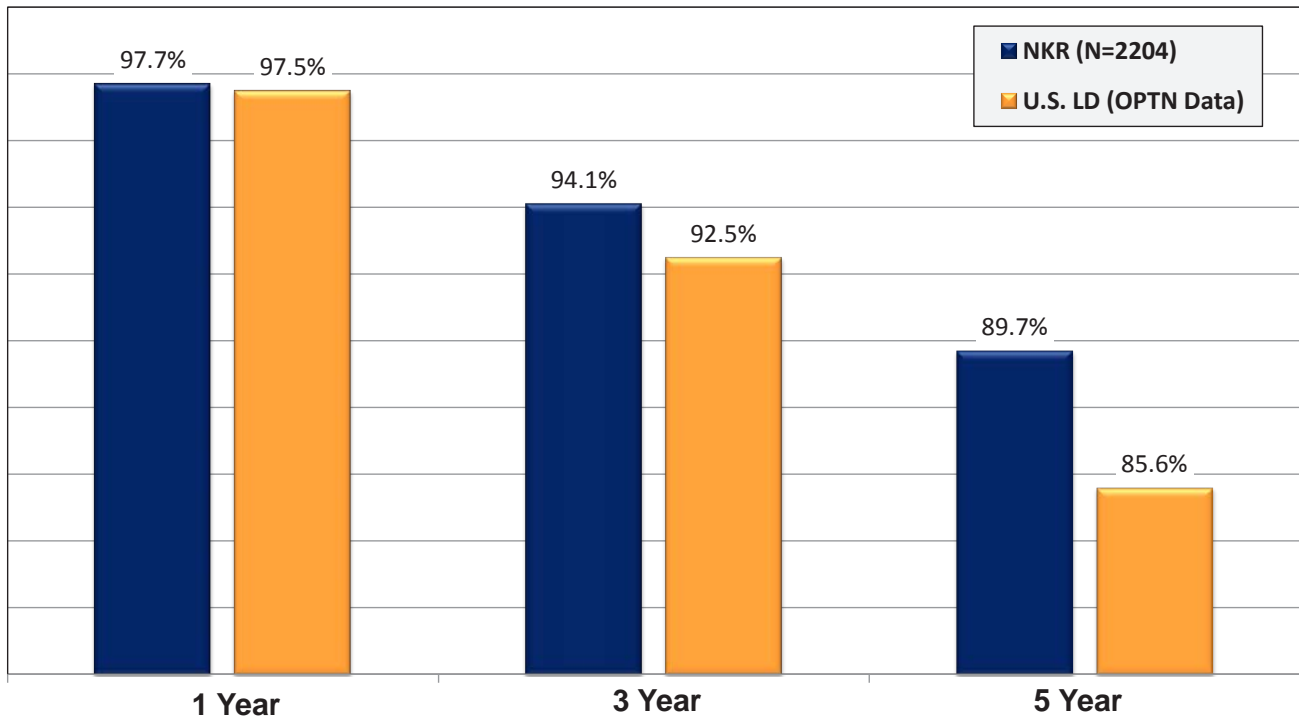
Referred to NKR Member Centers



# NKR Graft Survival Advantage

## NKR Transplants vs. U.S. Living Donor Transplants

As of 6/30/2017

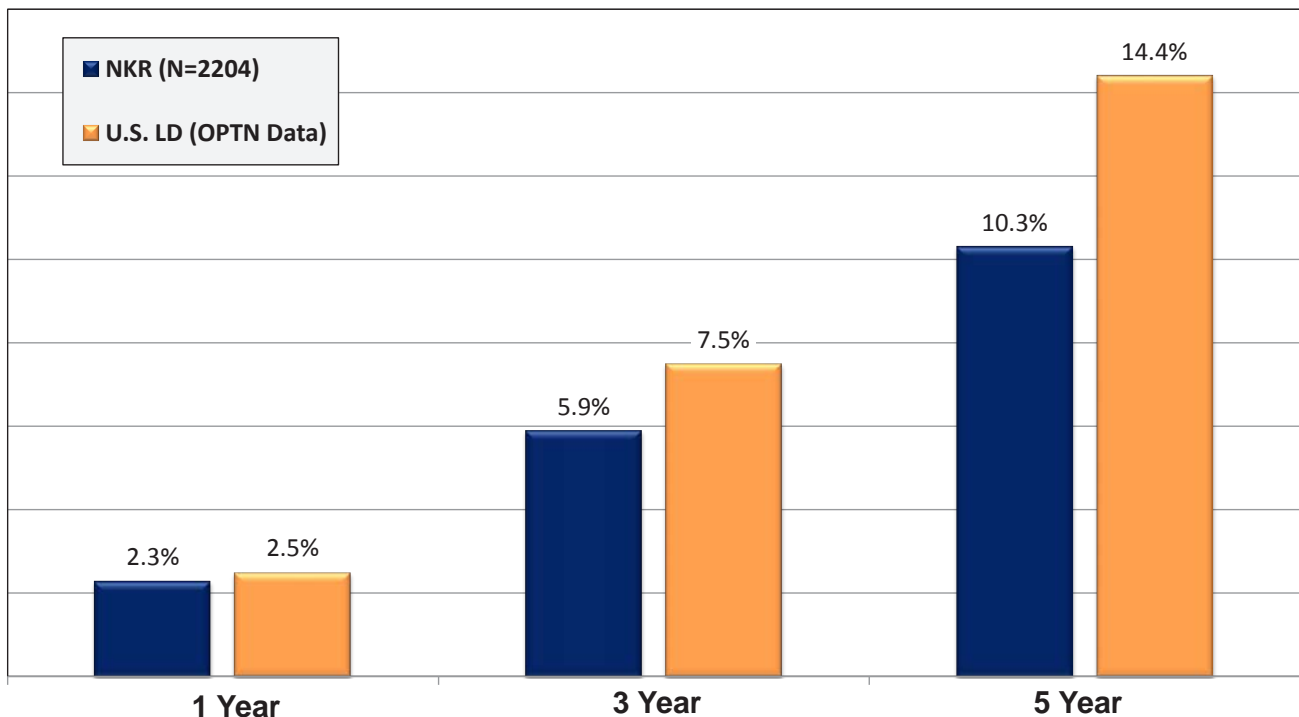


\*NKR Kaplan-Meier GS calculations provided courtesy of UCLA Departments of Nephrology and Urology  
 \*\*U.S LD - Kidney Kaplan-Meier GS Rates For Transplants Performed : 2008 - 2015  
<https://optn.transplant.hrsa.gov/data/view-data-reports/national-data/> OPTN data as of July 21, 2017

# Graft Failure Comparison

## NKR Transplants vs. U.S. Living Donor Transplants

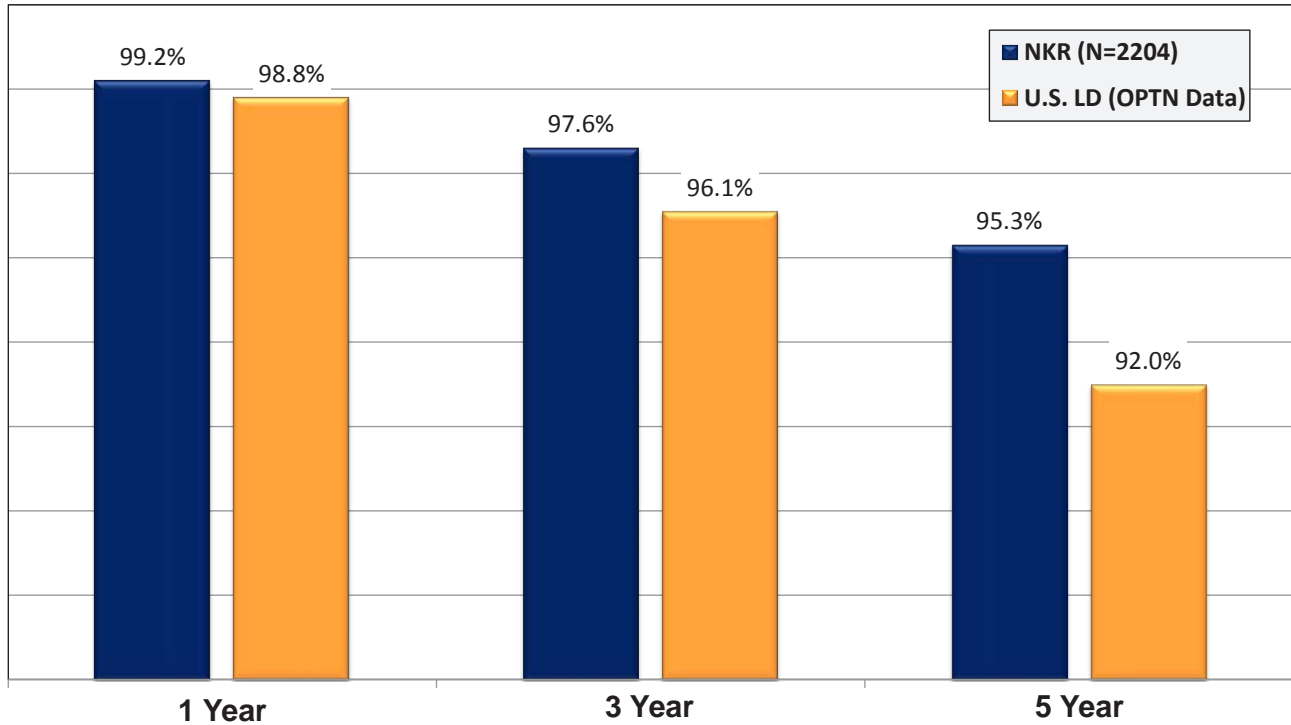
As of 6/30/2017



\*NKR Kaplan-Meier GS calculations provided courtesy of UCLA Departments of Nephrology and Urology  
 \*\*U.S LD - Kidney Kaplan-Meier GS Rates For Transplants Performed : 2008 - 2015  
<https://optn.transplant.hrsa.gov/data/view-data-reports/national-data/> OPTN data as of July 21, 2017

# NKR Patient Survival Advantage

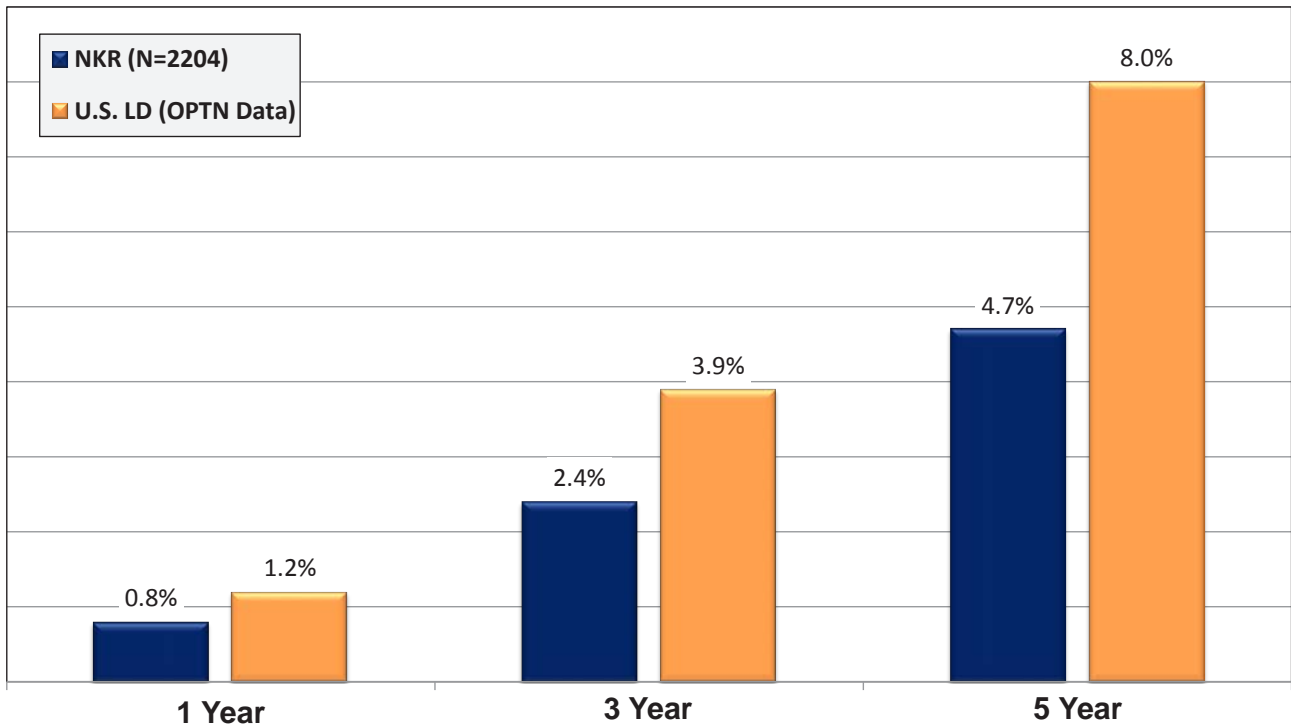
NKR Transplants vs. U.S. Living Donor Transplants  
As of 6/30/2017



\*NKR Kaplan-Meier PS calculations provided courtesy of UCLA Departments of Nephrology and Urology  
\*\*U.S LD - Kidney Kaplan-Meier PS Rates For Transplants Performed : 2008 - 2015  
<https://optn.transplant.hrsa.gov/data/view-data-reports/national-data/> OPTN data as of July 21, 2017

# Mortality Rate Comparison

NKR Transplants vs. U.S. Living Donor Transplants  
As of 6/30/2017

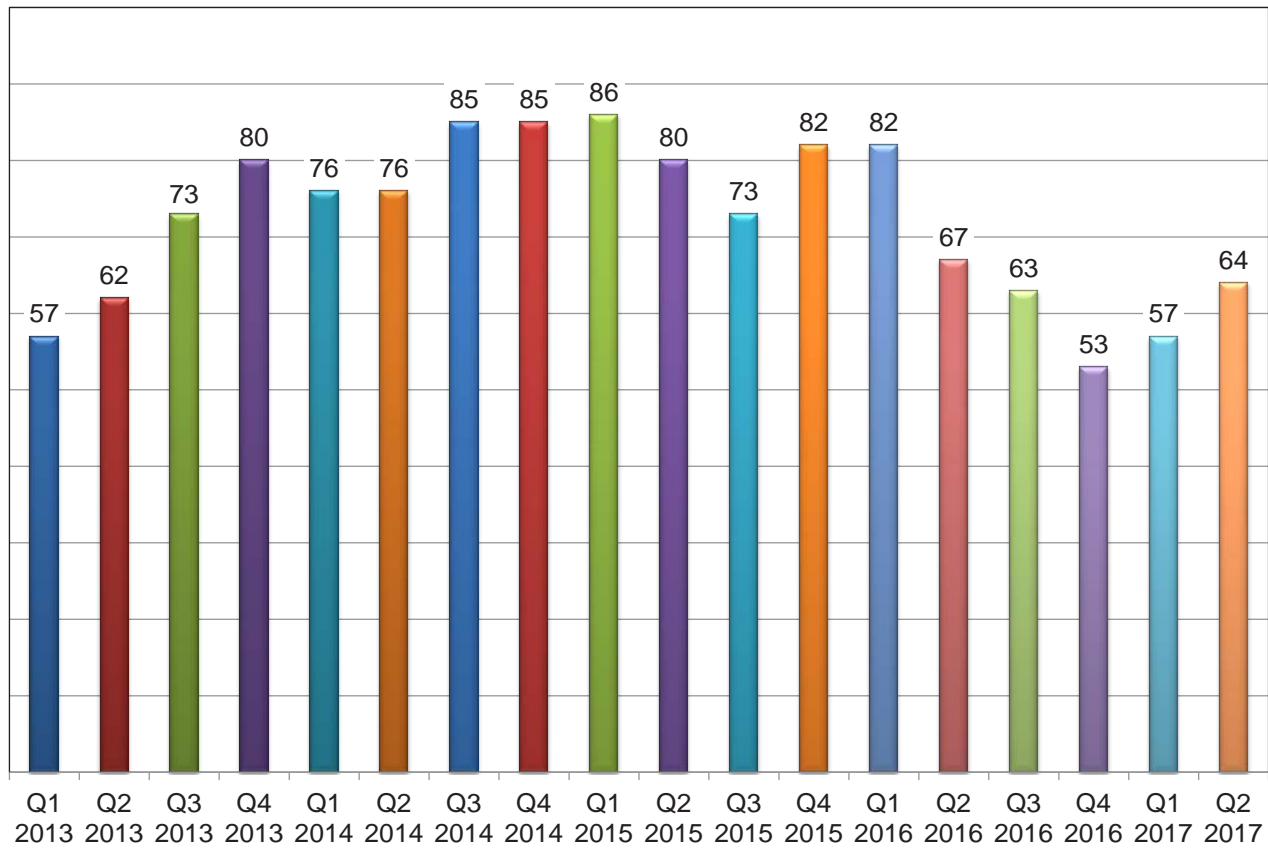


\*NKR Kaplan-Meier PS calculations provided courtesy of UCLA Departments of Nephrology and Urology  
\*\*U.S LD - Kidney Kaplan-Meier PS Rates For Transplants Performed : 2008 - 2015  
<https://optn.transplant.hrsa.gov/data/view-data-reports/national-data/> OPTN data as of July 21, 2017



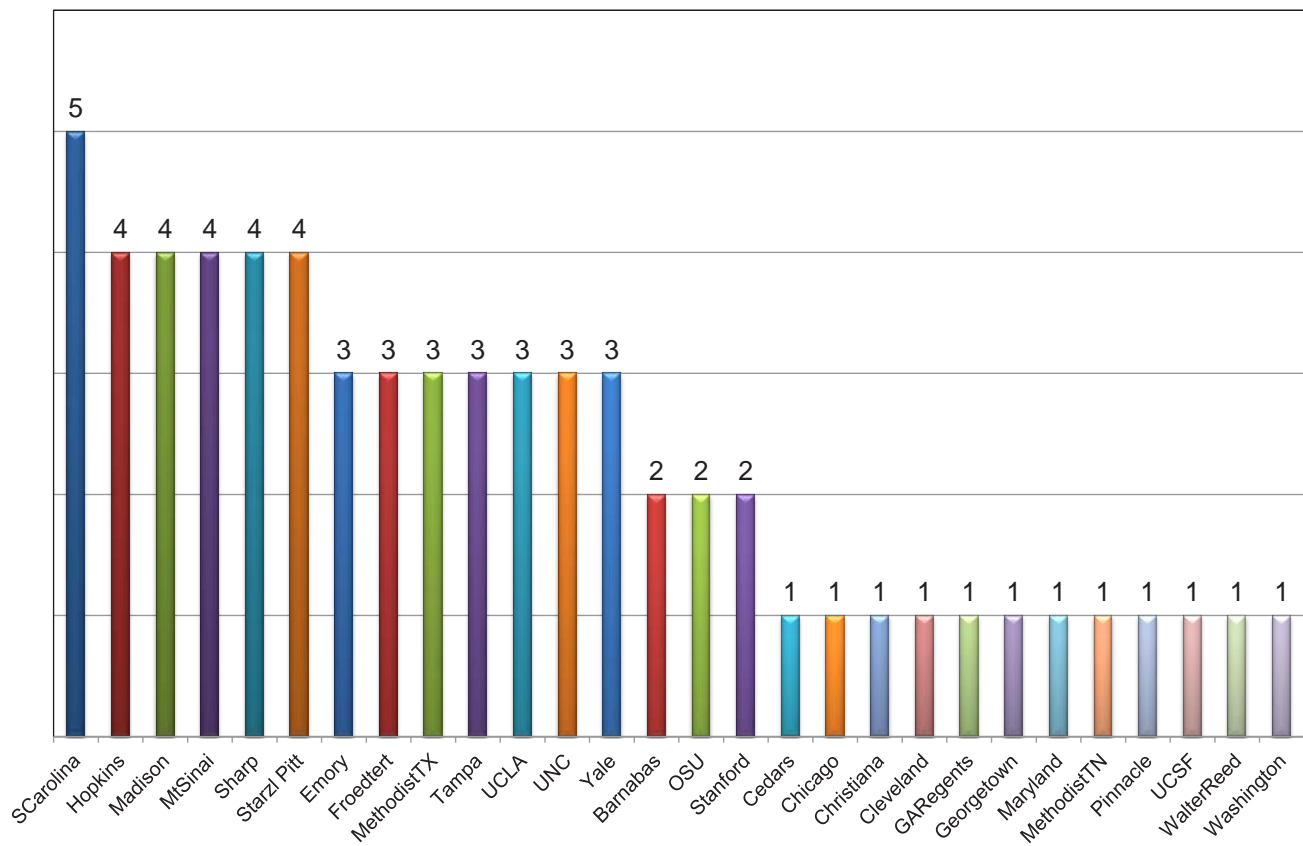
## Patients Waiting > 1 Year by Quarter

As of 6/30/2017



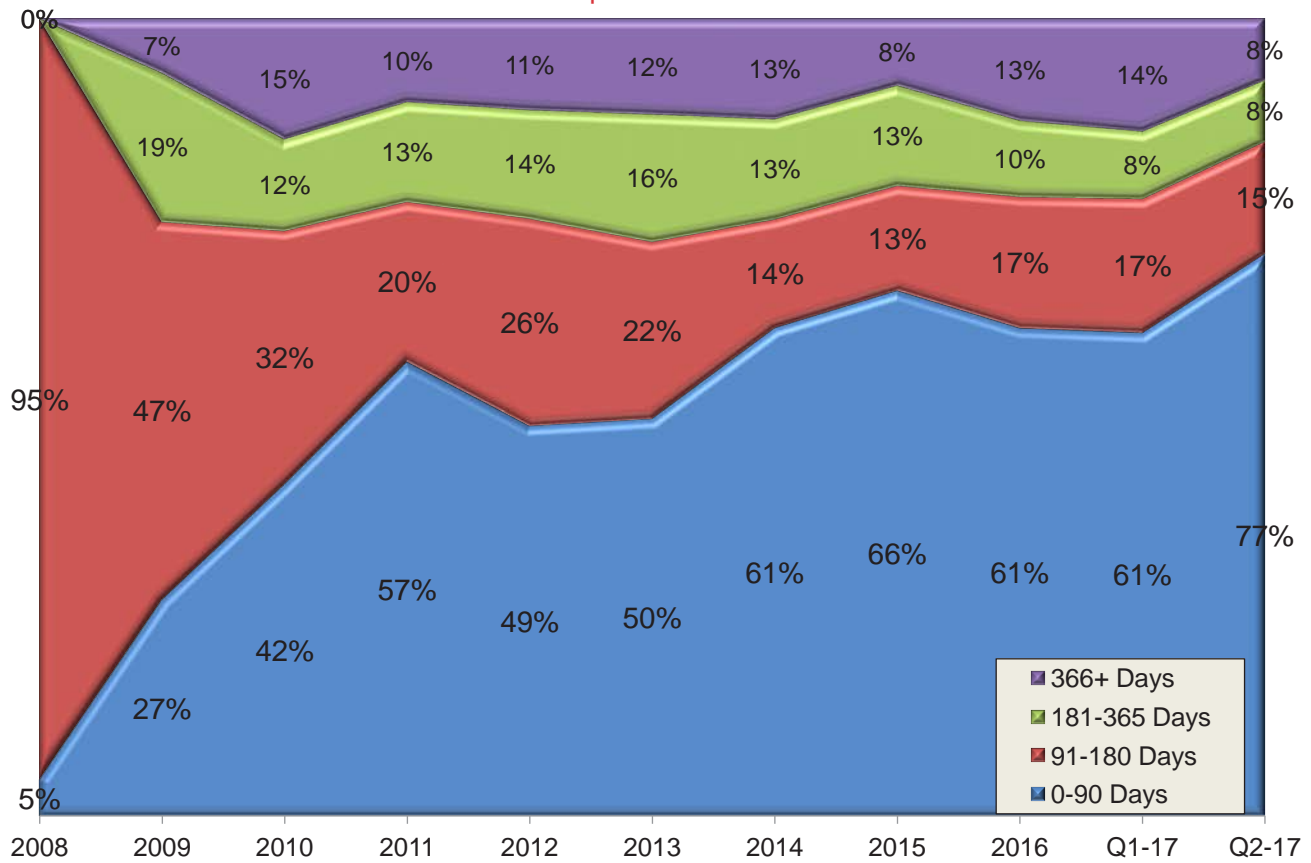
## Patients Waiting > 1 Year by Center

As of 6/30/2017



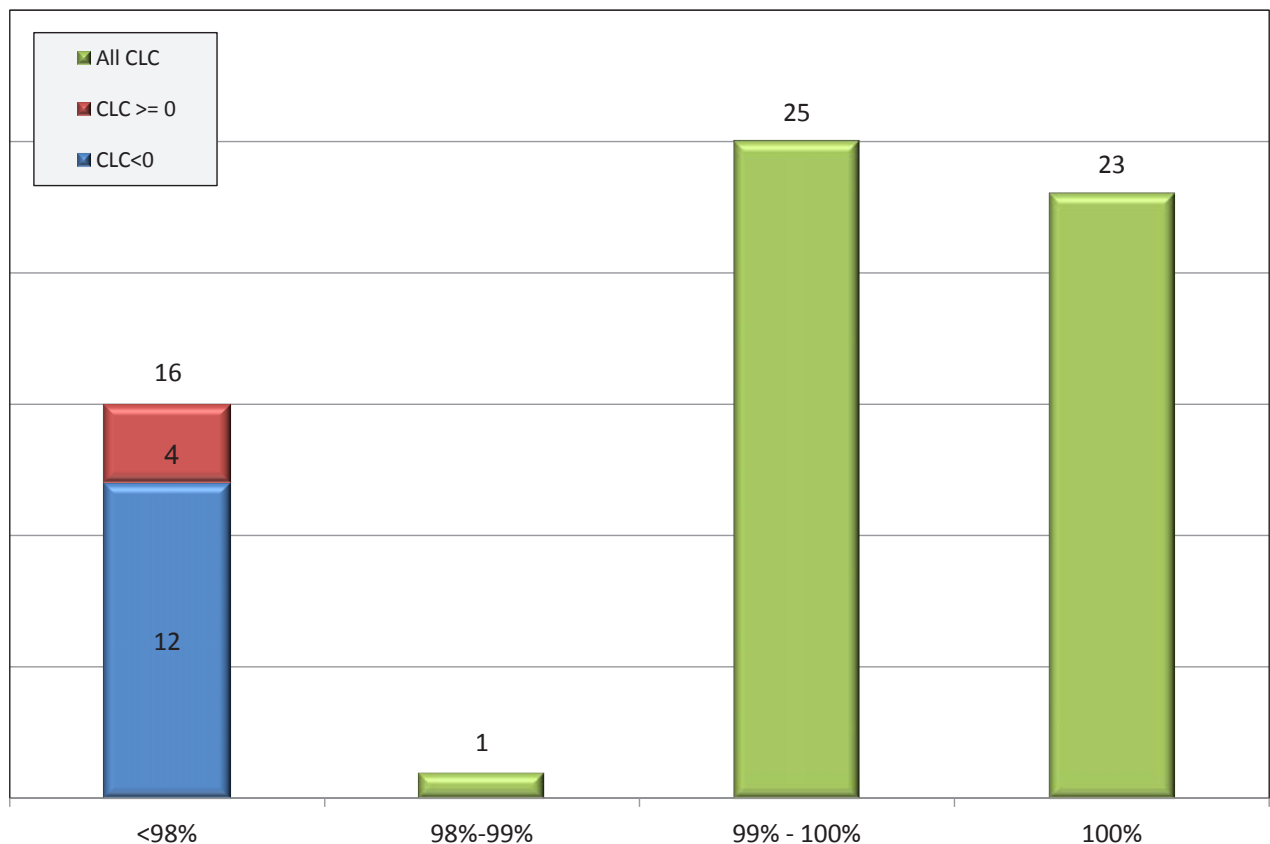
# Wait Time Distribution

Transplanted Pairs



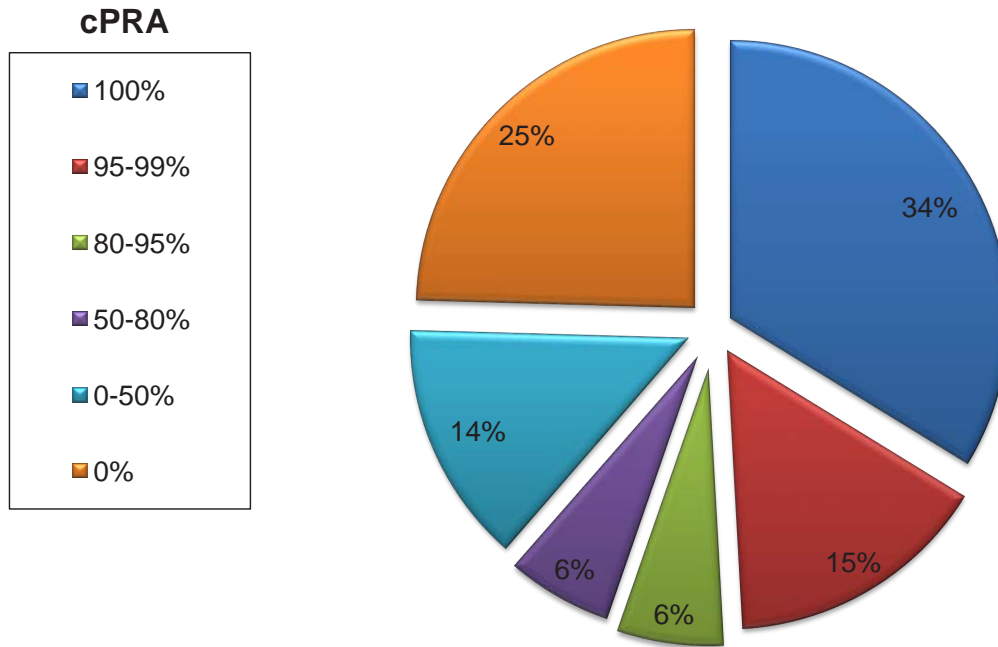
# Unmatched Target Pairs

Waiting more than 12 Months as of 6/30/2017

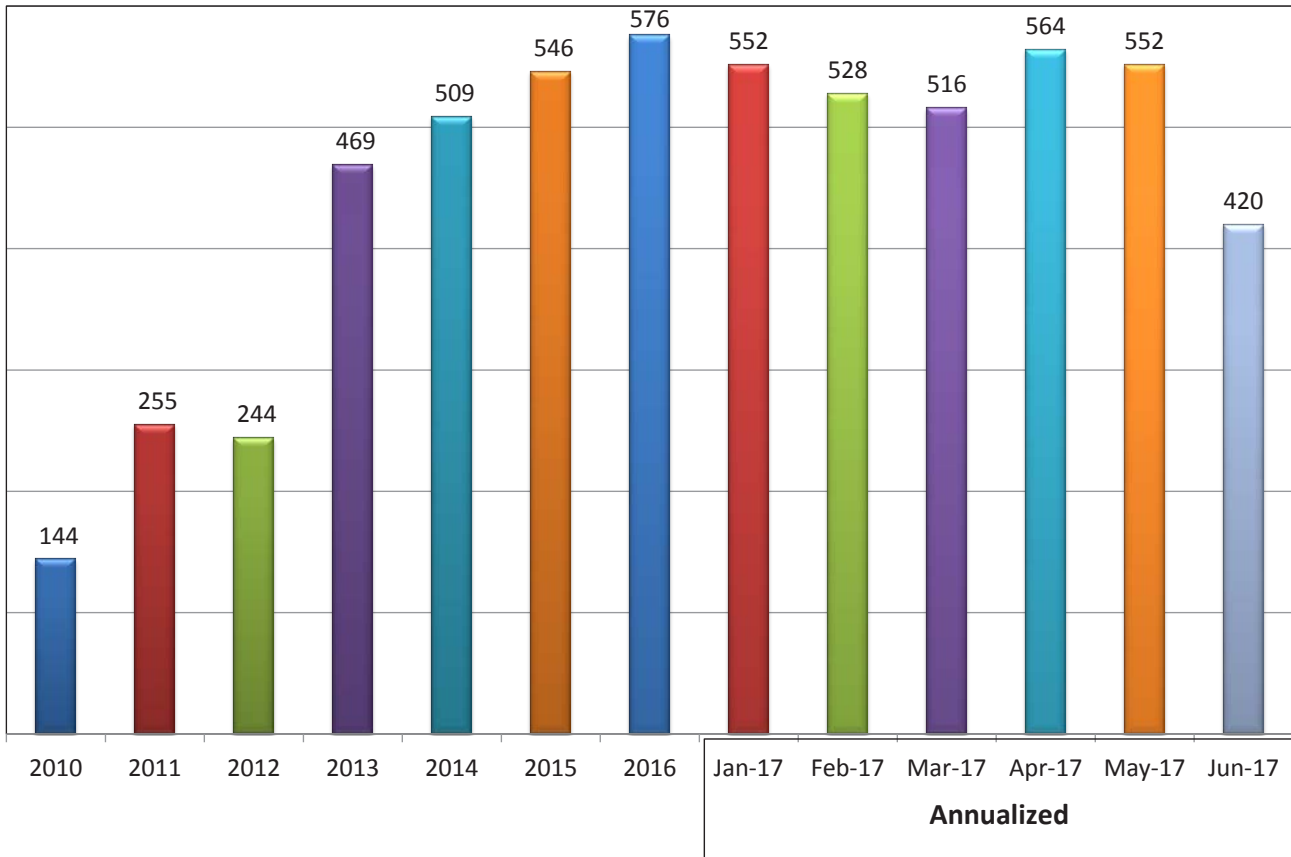


# Pool Composition by cPRA

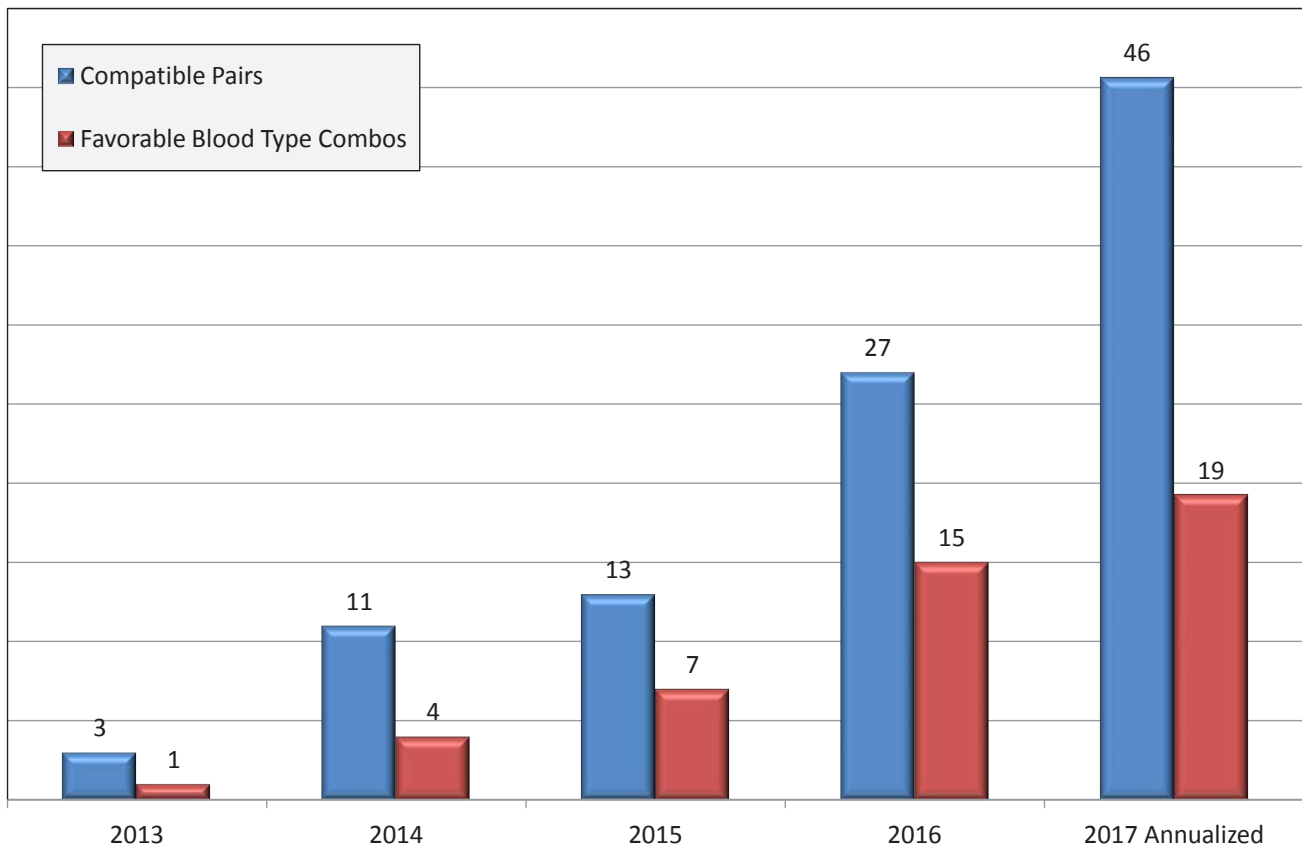
As of 6/30/2017



## New Exportable Pairs

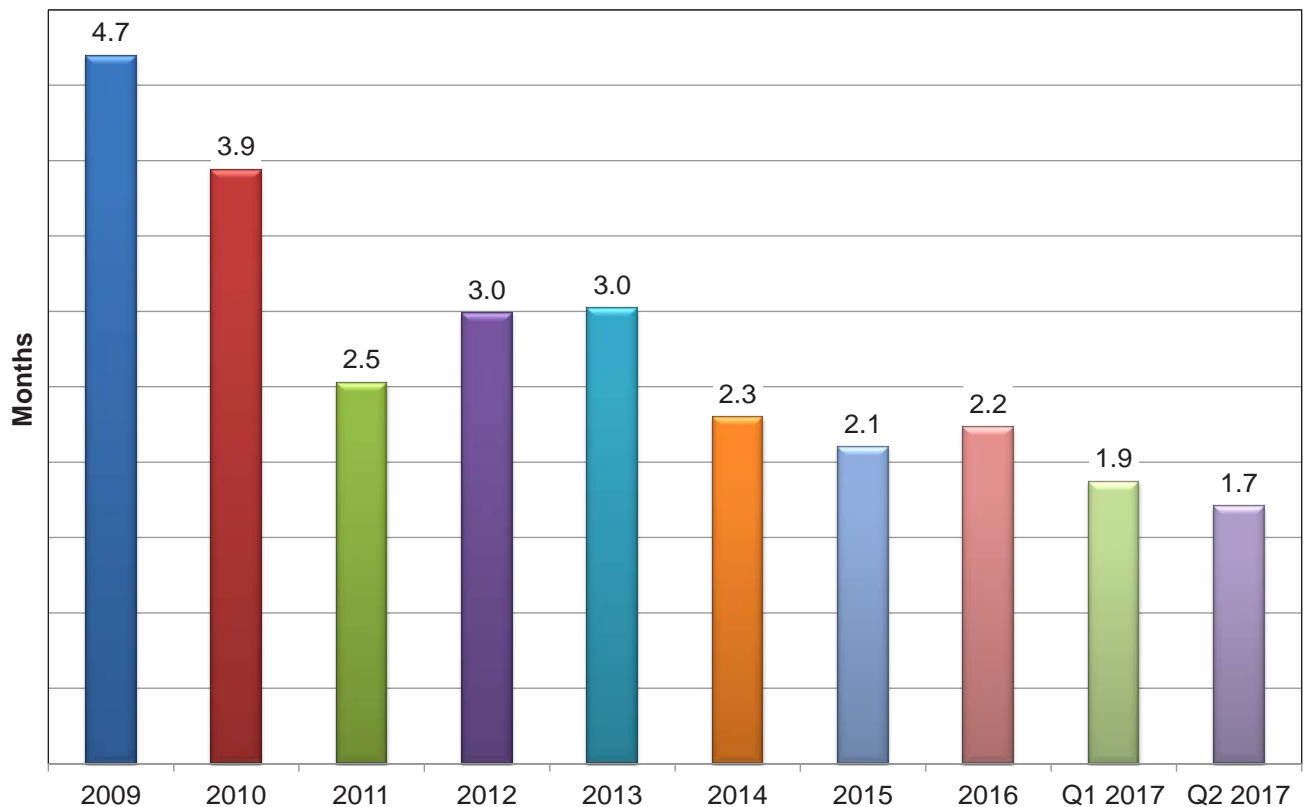


## Compatible Pairs Transplanted

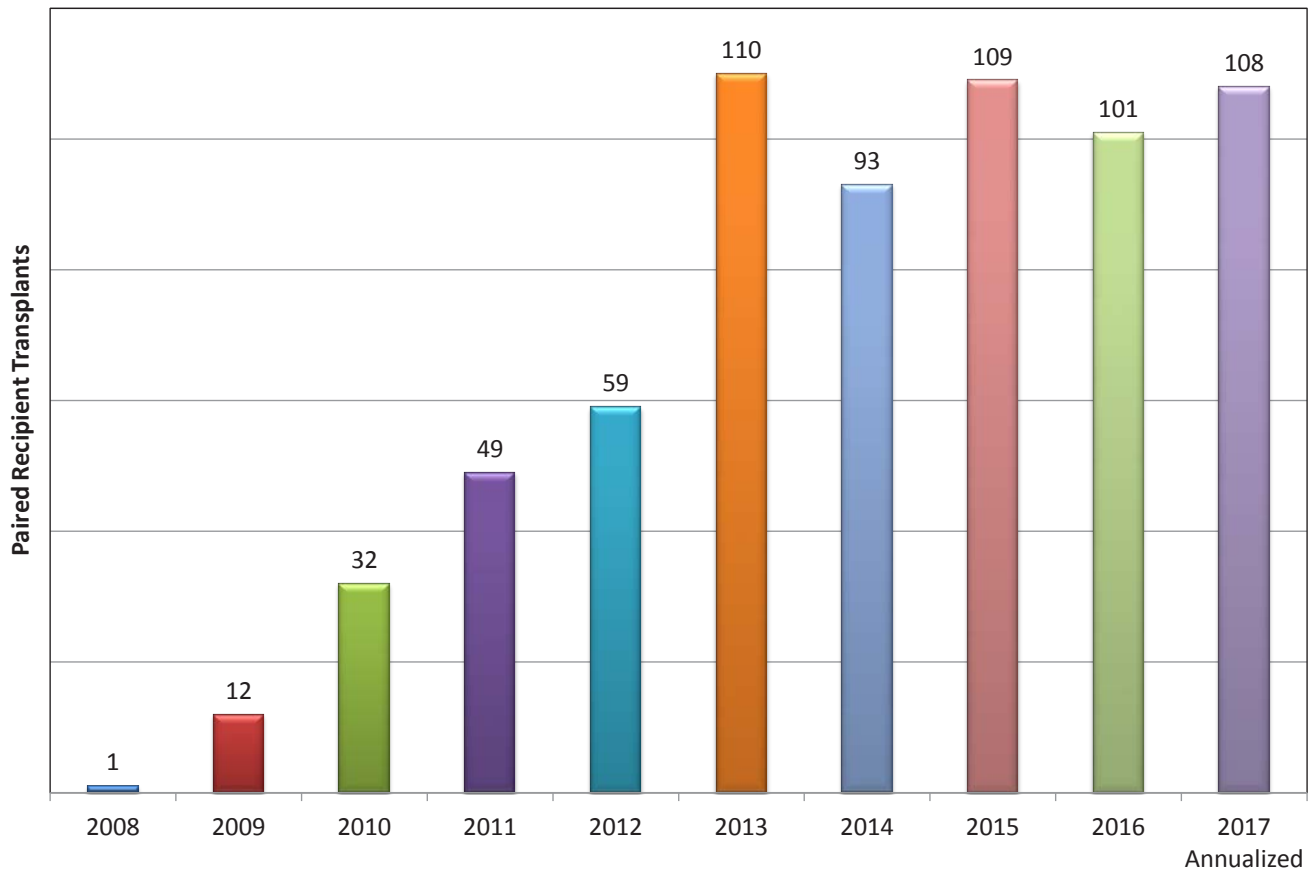


## Transplanted Patient Median Wait Time

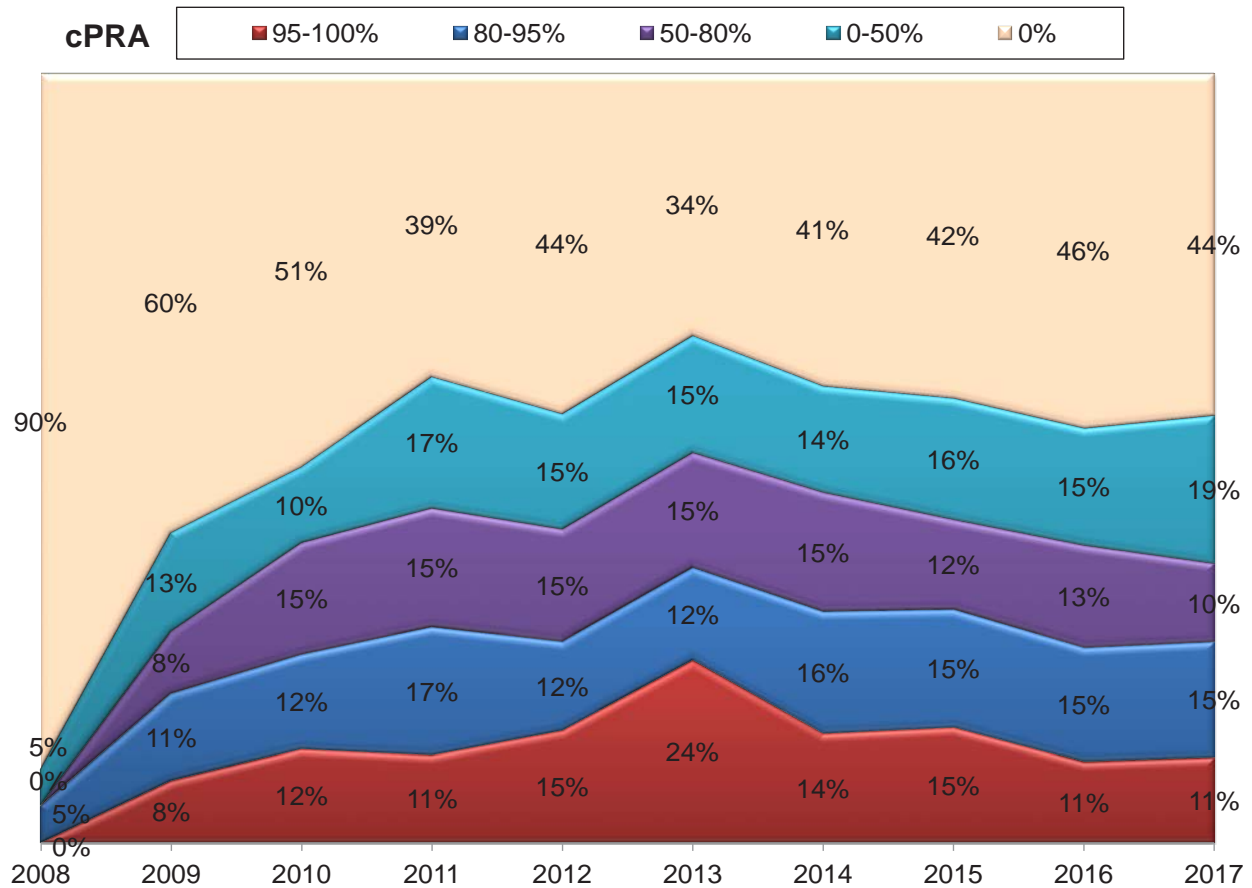
Wait times of patients transplanted during prior 12 months  
As of 6/30/2017



## Transplanted Patients with cPRA > 80%

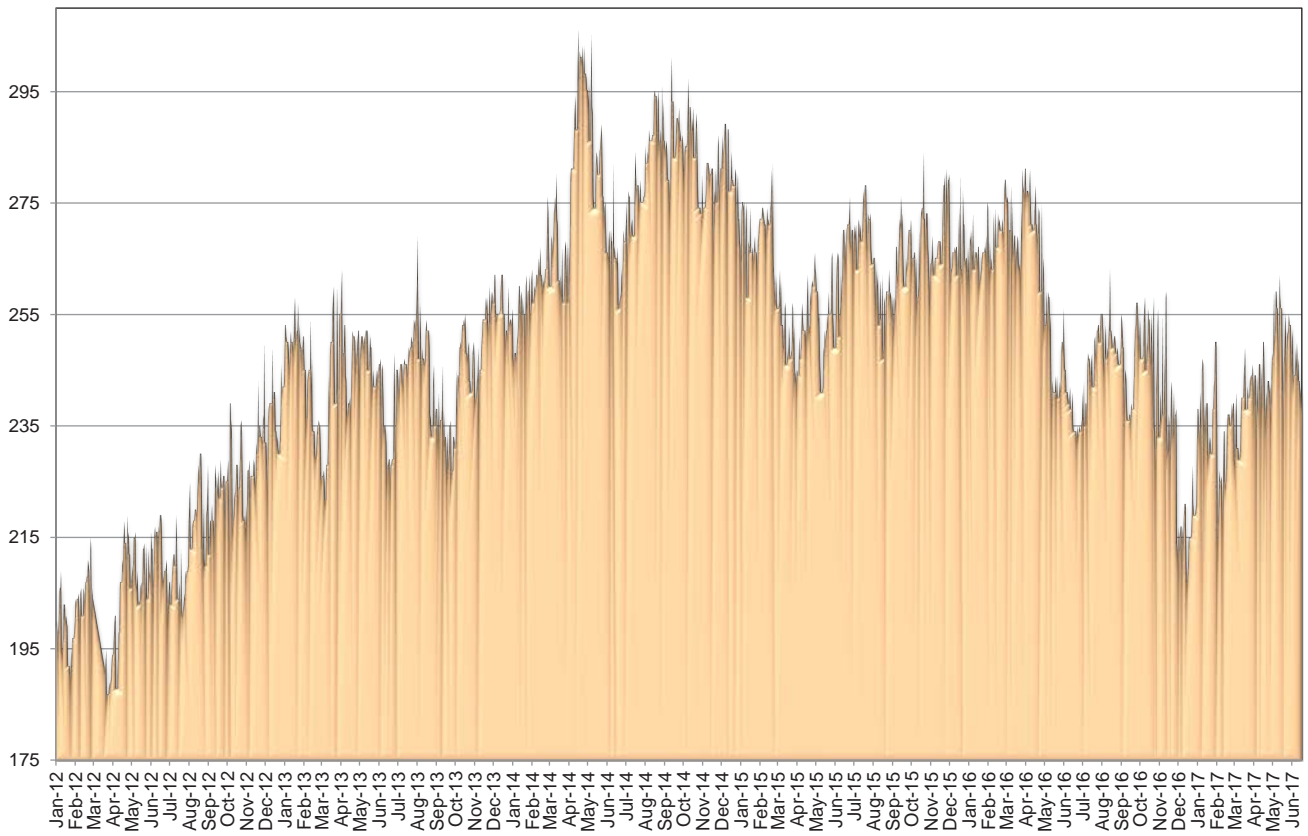


## Transplanted Patients by cPRA

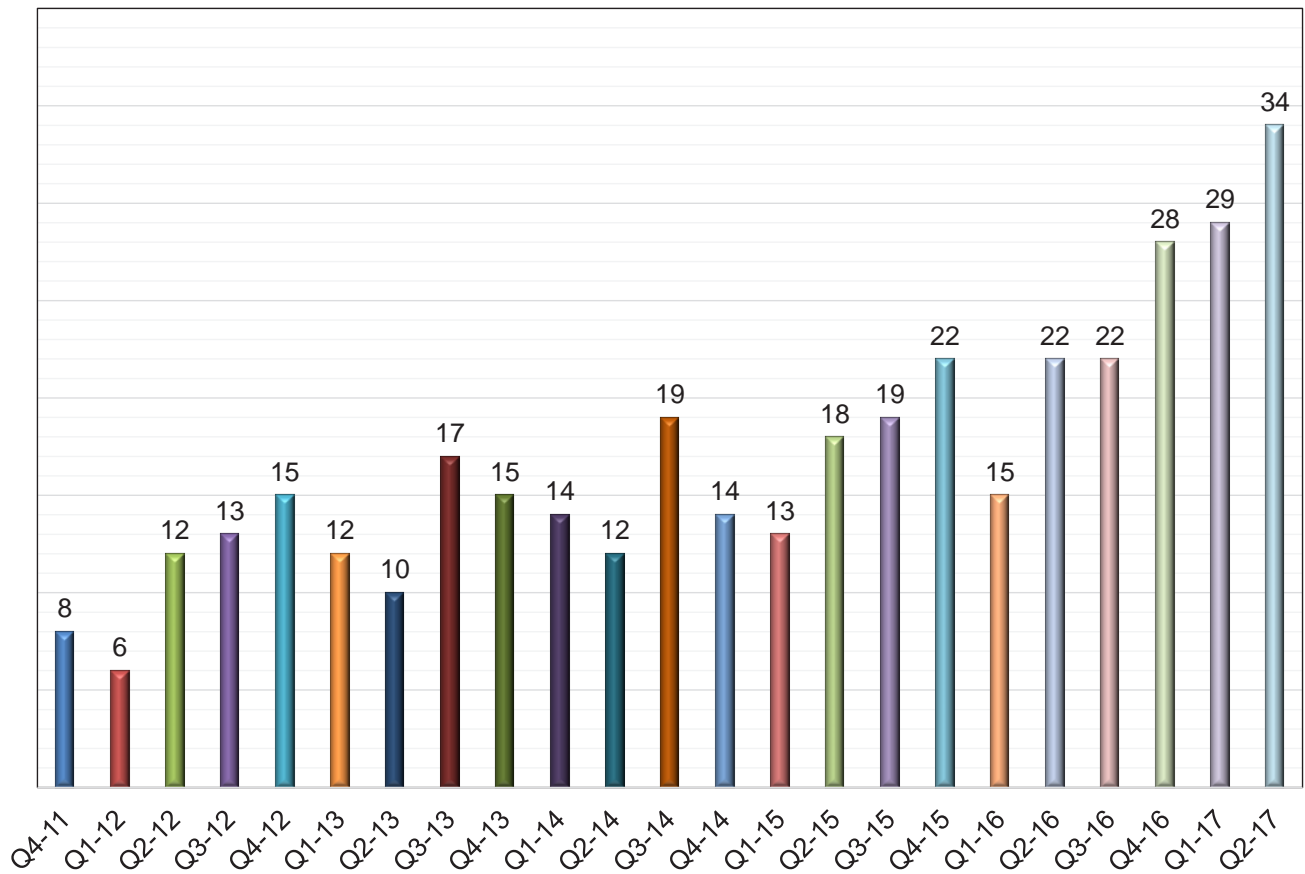


# Pool Size

Unmatched Patients by Day  
1/14/2012 – 6/30/2017



## Chains Started



## Chain and Loop Statistics

Category	Count	Mean Length	Transplants
Ended	430	4.34	1868
Broken	20	4.25	85
Active	5	4.00	20
<b>Chain Total</b>	<b>455</b>	<b>4.34</b>	<b>1973</b>
Loops	99	2.32	230
<b>Total</b>	<b>554</b>	<b>3.98</b>	<b>2203</b>

\*\*Updates as of 7/18/17

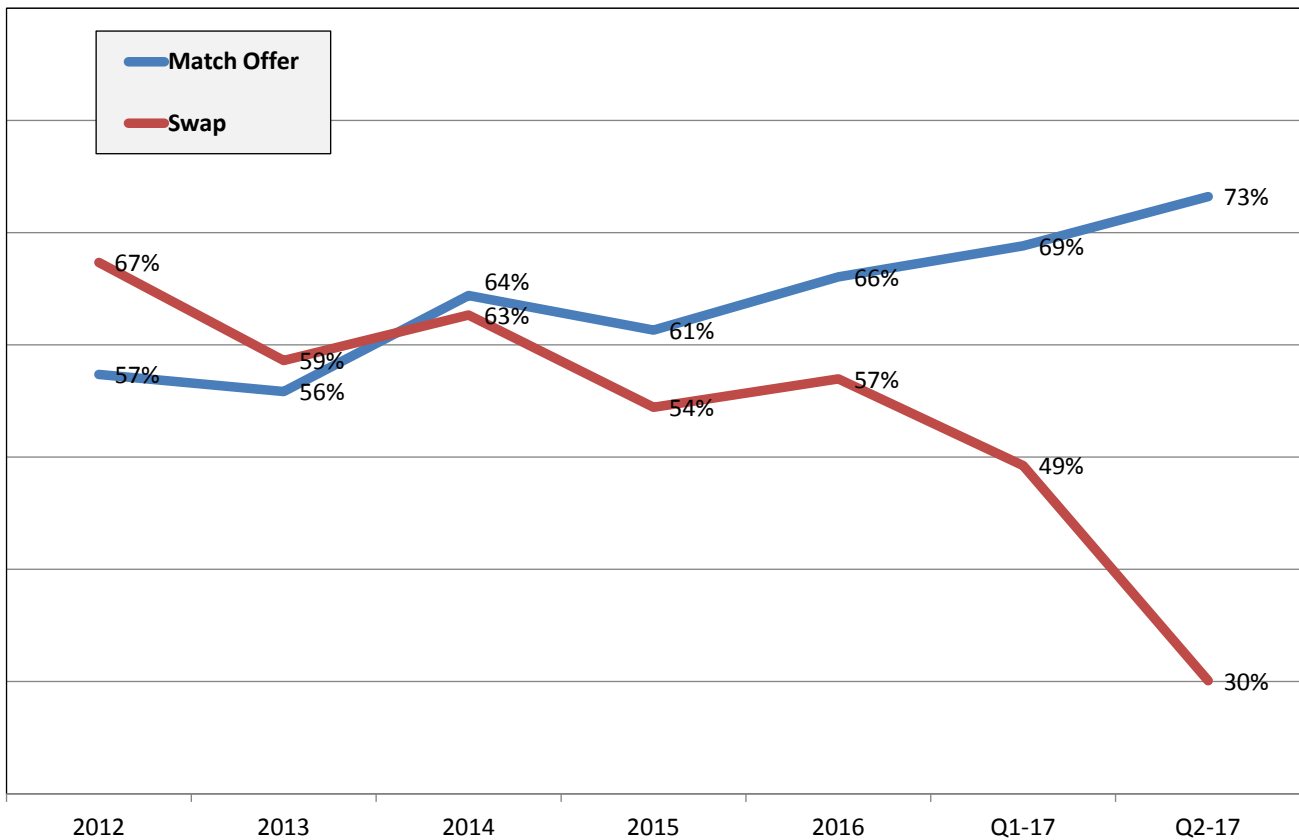
# Great HLA Matches

## Zero Mismatch

Count	Recipient Center	Swap #	XP Date	Donor ABO	Recipient ABO	NKR cPRA	Wait Time In Months	Donor Age ATOT	Recipient Age ATOT	HLA Points
1	Hopkins	1019	6/1/2017	A	AB	0	2	40	55	100
2	Brigham	1026	5/24/2017	A	A	95	2	58	33	100
3	ChristHosp	952	1/18/2017	A	A	99	1	57	34	100
4	UMinn	928	11/8/2016	A	A	100	4	66	12	100
5	Cincinnati	884	8/31/2016	A	A	73	1	28	40	100
6	OSU	509	8/30/2016	A	A	91	1	38	67	100
7	SCarolina	459	2/11/2016	A	A	100	3	64	53	100
8	Madison	442	12/22/2015	A	A	97	6	22	63	100
9	UMinn	440	11/19/2015	O	O	100	5	23	20	100
10	UCLA	357	2/17/2015	A	A	100	34	39	52	100
11	Emory	351	12/11/2014	A	A	100	5	25	33	100
12	Hopkins	330	11/13/2014	A	O	96	1	41	38	100
13	Loyola	324	8/5/2014	A	A	100	1	37	55	100
14	Madison	674	1/9/2014	O	A	99	5	29	33	100
15	Barnabas	182	10/3/2012	A	A	92	4	51	50	100
16	Barnes	105	3/31/2011	A	A	100	7	60	32	100
17	UCSF	58	6/15/2010	A	A	100	6	47	58	100

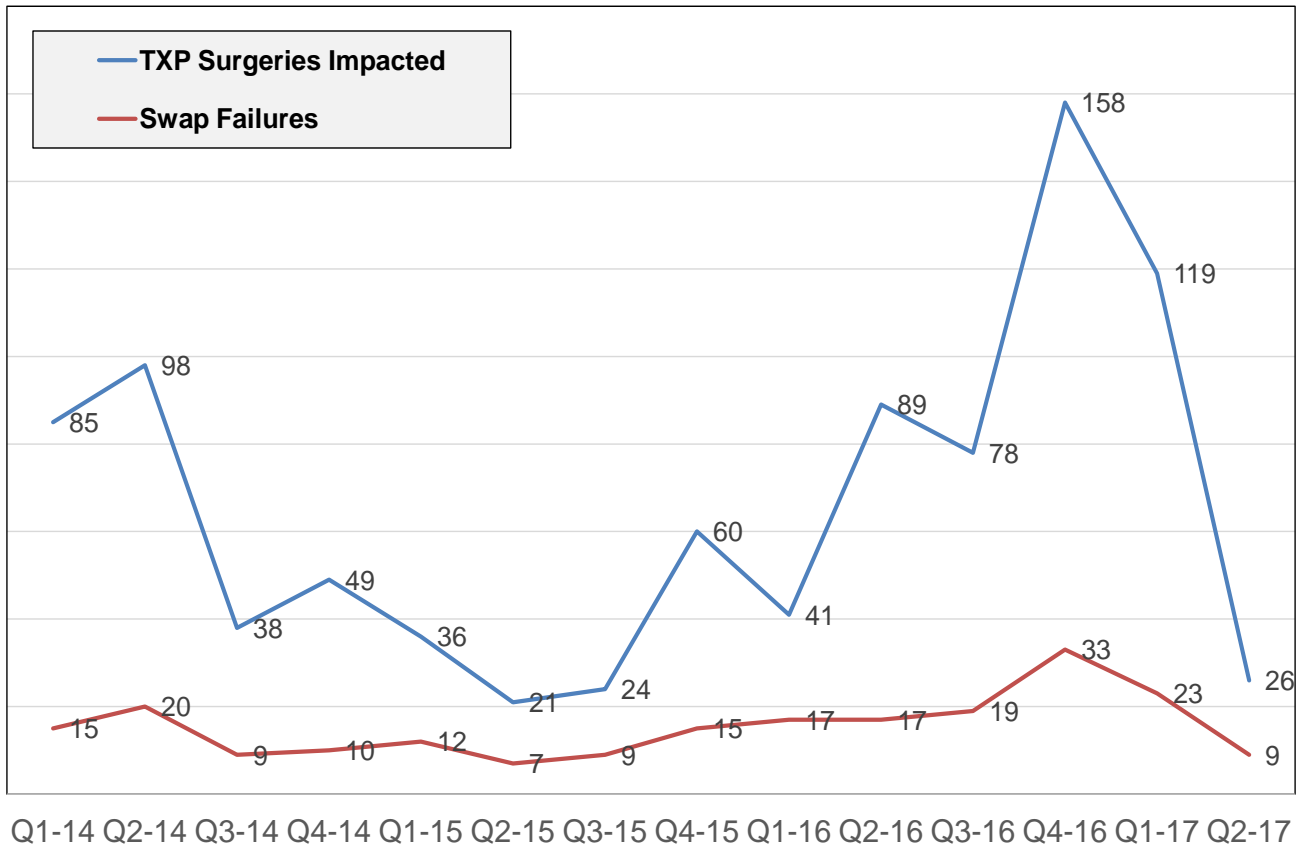
## Failure Rates

MO Rate =  $1 - (XM/MO)$   
 Swap Rate =  $1 - (TXP/XM)$

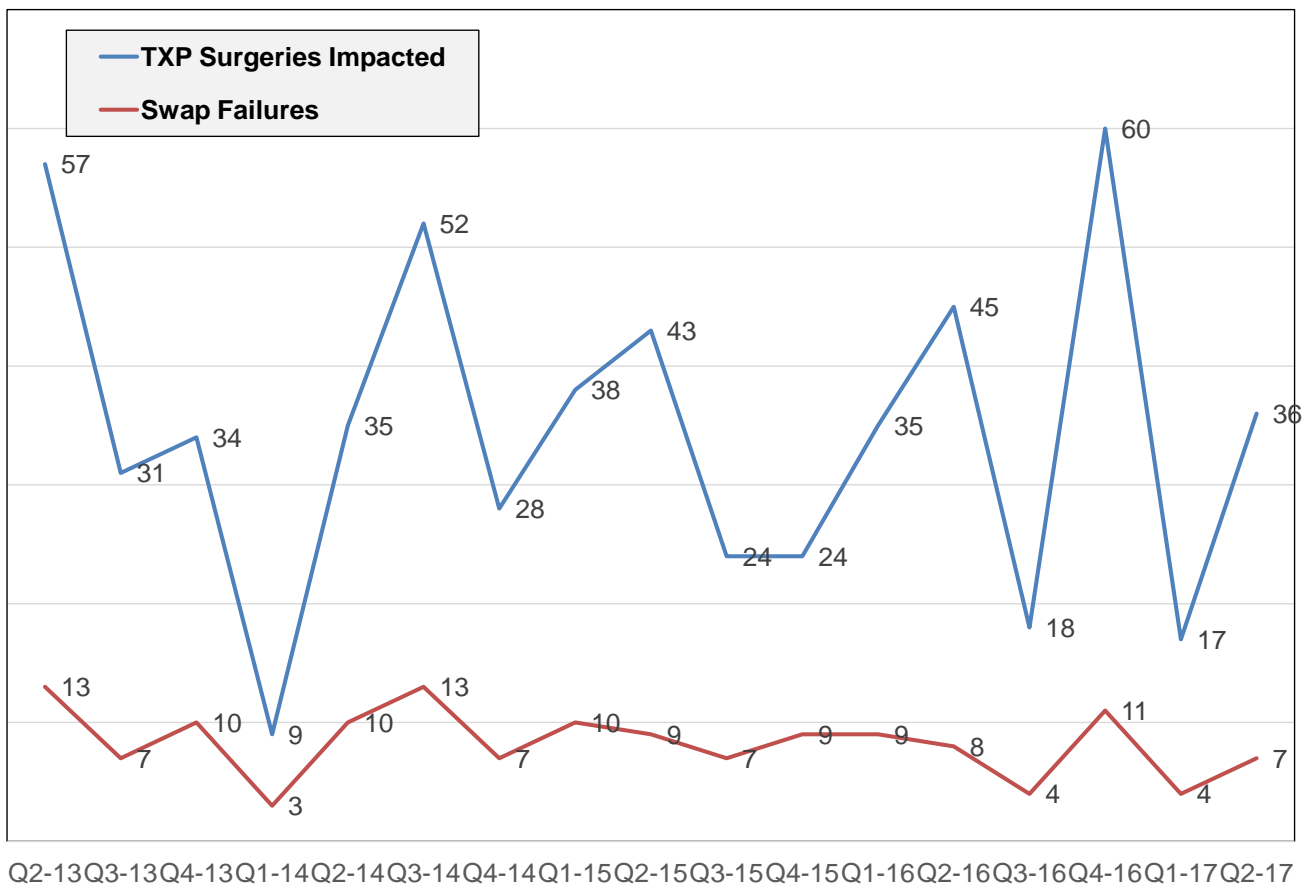




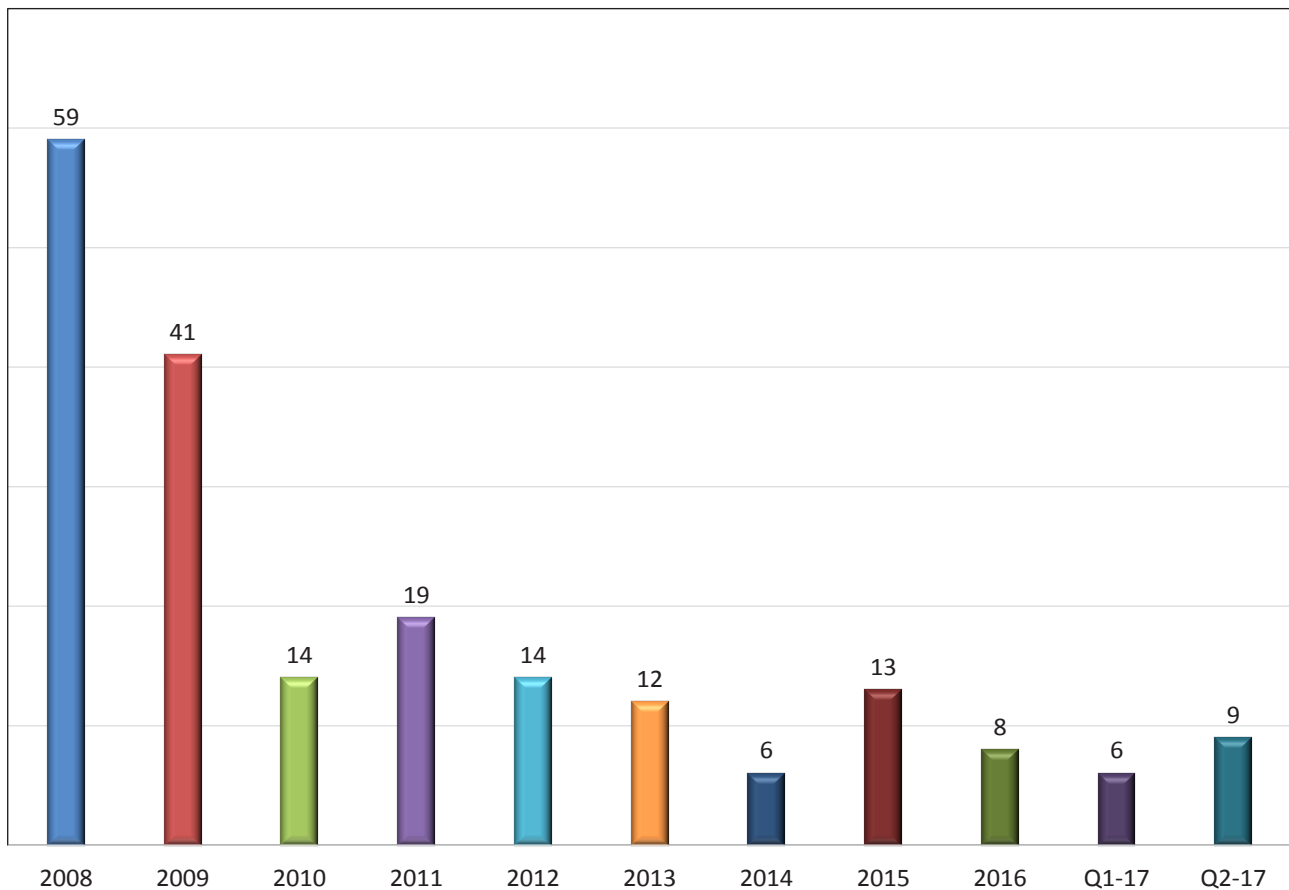
## Non-XM Swap Failures & TXP Surgeries Impacted



## XM Swap Failures & TXP Surgeries Impacted



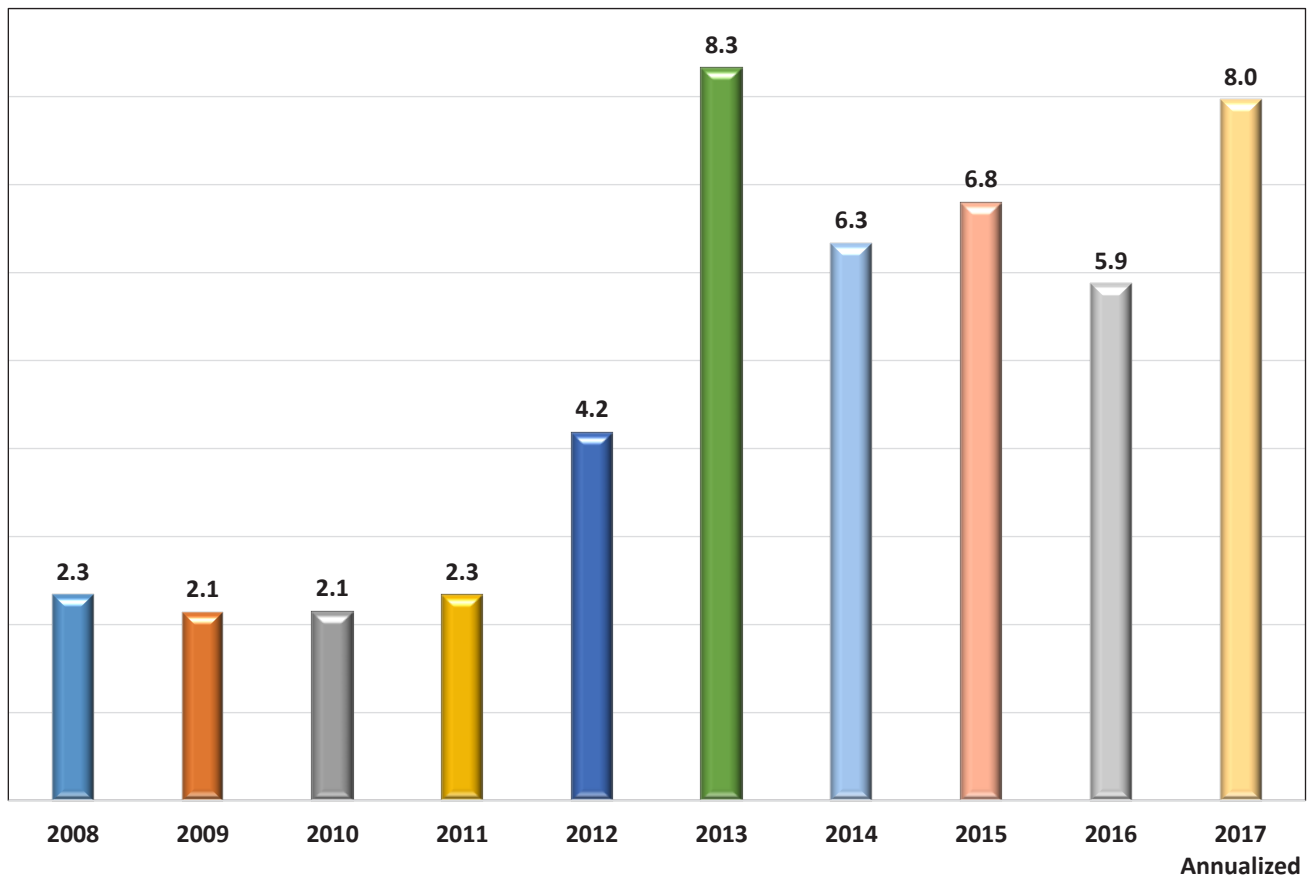
## Bridge Donor Median Wait Times in Days



## Bridge Donor Wait Times

Year	Median	Mean	Max	Min
2008	59	53	77	16
2009	41	59	187	3
2010	14	51	385	2
2011	19	23	68	4
2012	14	29	314	2
2013	12	20	92	2
2014	6	11	97	2
2015	13	26	175	2
2016	8	14	71	2
Q1-17	6	7	29	2
Q2-17	9	15	65	2

## Transplants per Bridge Donor



# Summary Report

## Broken Chains & Real Time Swap Failures

Year	# Bridge Donors	# Real Time Swap Failures	# Broken Chains	% Broken Per Year
2008	9	--	3	33%
2009	29	1	2	7%
2010	61	--	2	3%
2011	75	--	0	0%
2012	54	--	4	7%
2013	37	3	3	8%
2014	49	2	4	8%
2015	53	1	1	2%
2016	68	1	2	3%
2017	52	--	1	2%
<b>Total</b>	<b>487</b>	<b>8</b>	<b>22</b>	

# Detail Report

## Broken Chains & Real Time Swap Failures

#	Reason Given	Real Time Swap Failures	Broken Chains	Center	Date
1	Job Issues/ long wait time/ many failed XMs		✓	Cornell	5/1/2008
2	No Reason		✓	Cornell	8/21/2008
3	No Reason		✓	CPMC	11/19/2008
4	Donor sick for swap then reneged later	✓	✓	UTMC	6/9/2009
5	Medical		✓	UCSF	11/10/2009
6	Medical		✓	UCLA	3/16/2010
7	Second nuclear GFR test < 80 (79 down from 82)		✓	AGH	9/16/2010
8	No Reason		✓	MethodistTX	2/3/2012
9	No Reason		✓	UCSF	4/4/2012
10	Medical		✓	UCLA	6/28/2012
11	Medical/Surgical		✓	Washington	11/5/2012
12	Aborted donor surgery	✓	✓	CPMC	6/27/2013
13	Kidney declined by recipient surgeon	✓	✓	RWJ/UPenn	7/23/2013
14	Recipient Medical Issue	✓	✓	Porter	10/16/13
15	Kidney Declined by Recipient Surgeon	✓	✓	Porter/Jefferson	1/9/14
16	Medical		✓	UCLA	3/4/14
17	Recipient Medical Issue	✓	Loop	ChristHosp	3/11/14
18	Medical		✓	Hopkins	7/15/14
19	Medical		✓	Hopkins	10/9/14
20	Kidney Declined by Recipient Surgeon	✓	✓	Tampa/Hopkins	7/7/15
21	Kidney Declined by Recipient Surgeon	✓	--	Porter/Aurora St Lukes	3/17/16
22	Donor reneged		✓	Maryland	8/8/16
23	Donor reneged		✓	SCarolina	1/10/17
	<b>Total</b>	<b>8</b>	<b>21</b>		

# Advanced Donation Program

Summary  
As of 6/30/2017

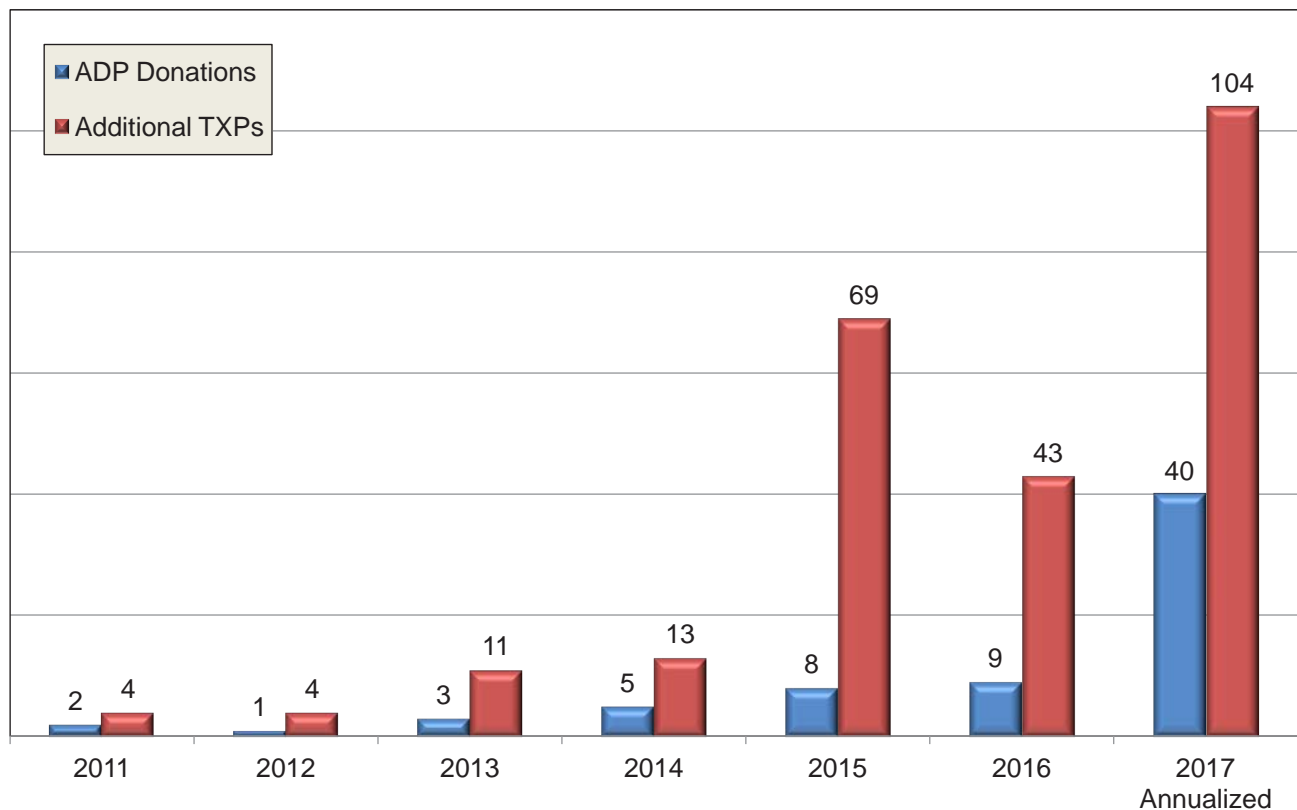
Type	Cases	Add'l TXPs Facilitated	80%+ cPRA TXPs Facilitated	95%+ cPRA TXPs Facilitated
Short-Term*	27	128	48	28
Voucher**	21	68	10	4
<b>Total</b>	<b>48</b>	<b>196</b>	<b>58</b>	<b>32</b>

\*Short-Term– At time of advanced donation the intended ADP Recipient is in need of transplant.

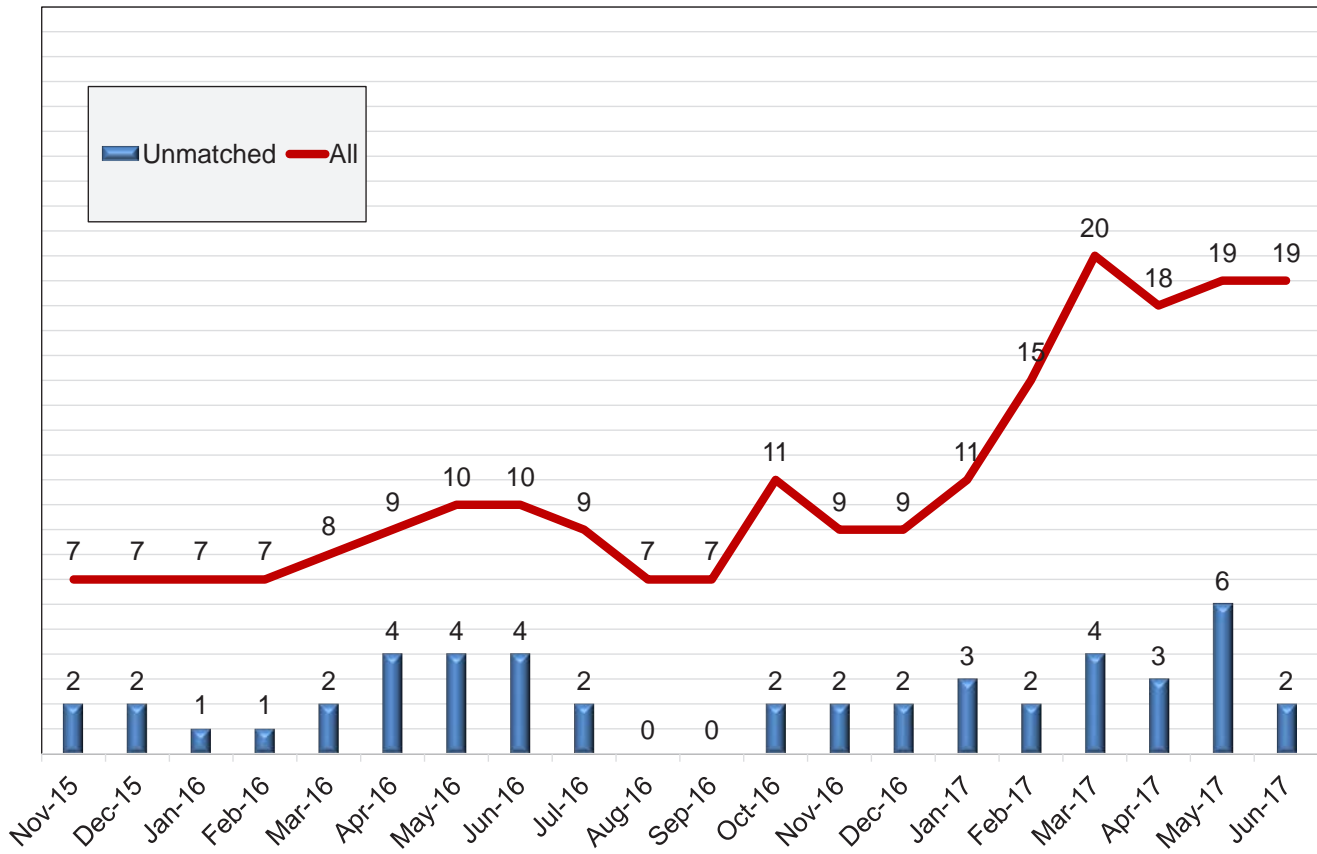
\*\*Voucher - At time of advanced donation the intended ADP Recipient is not in need and may never be in need of transplant.

# Advanced Donation Program

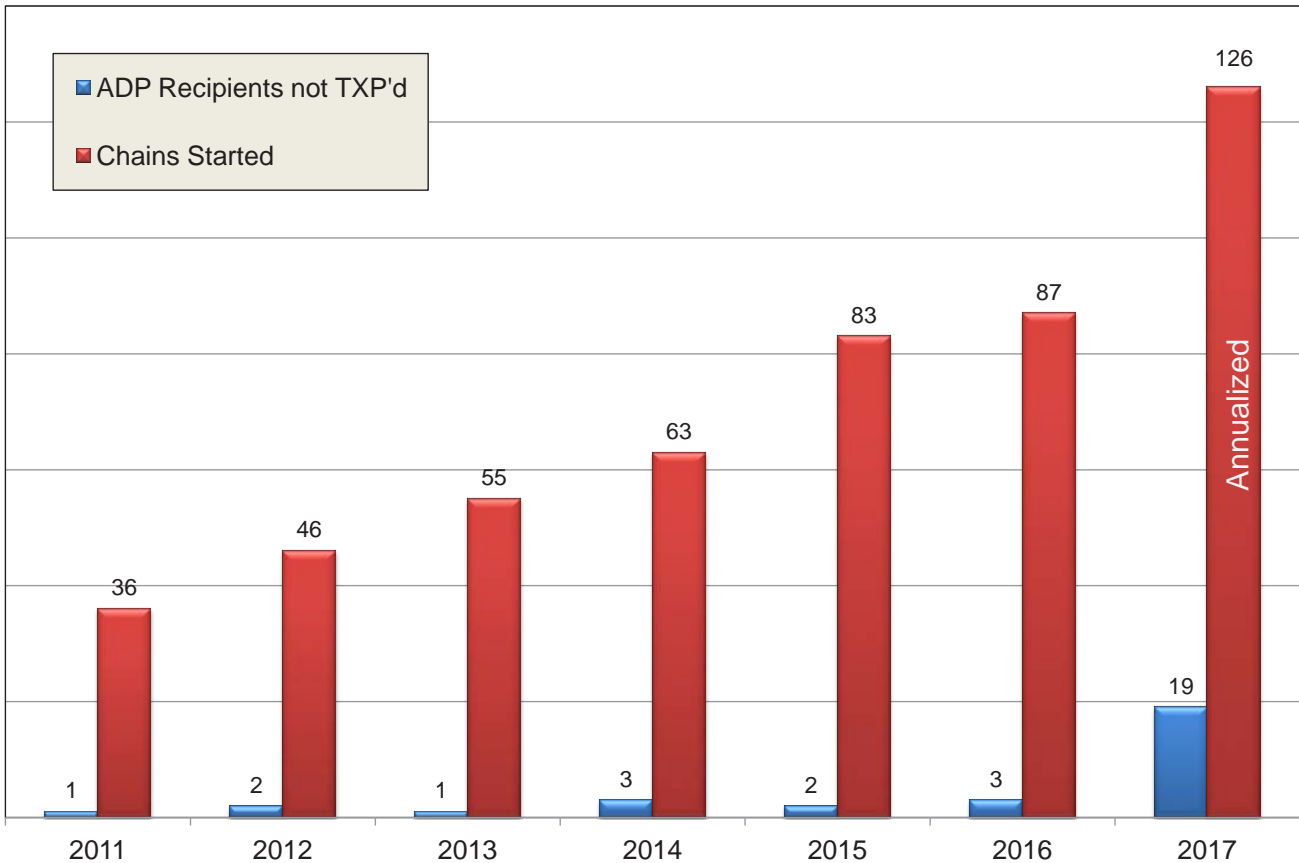
Donations & Additional TXPs Facilitated



## ADP Recipient Pool

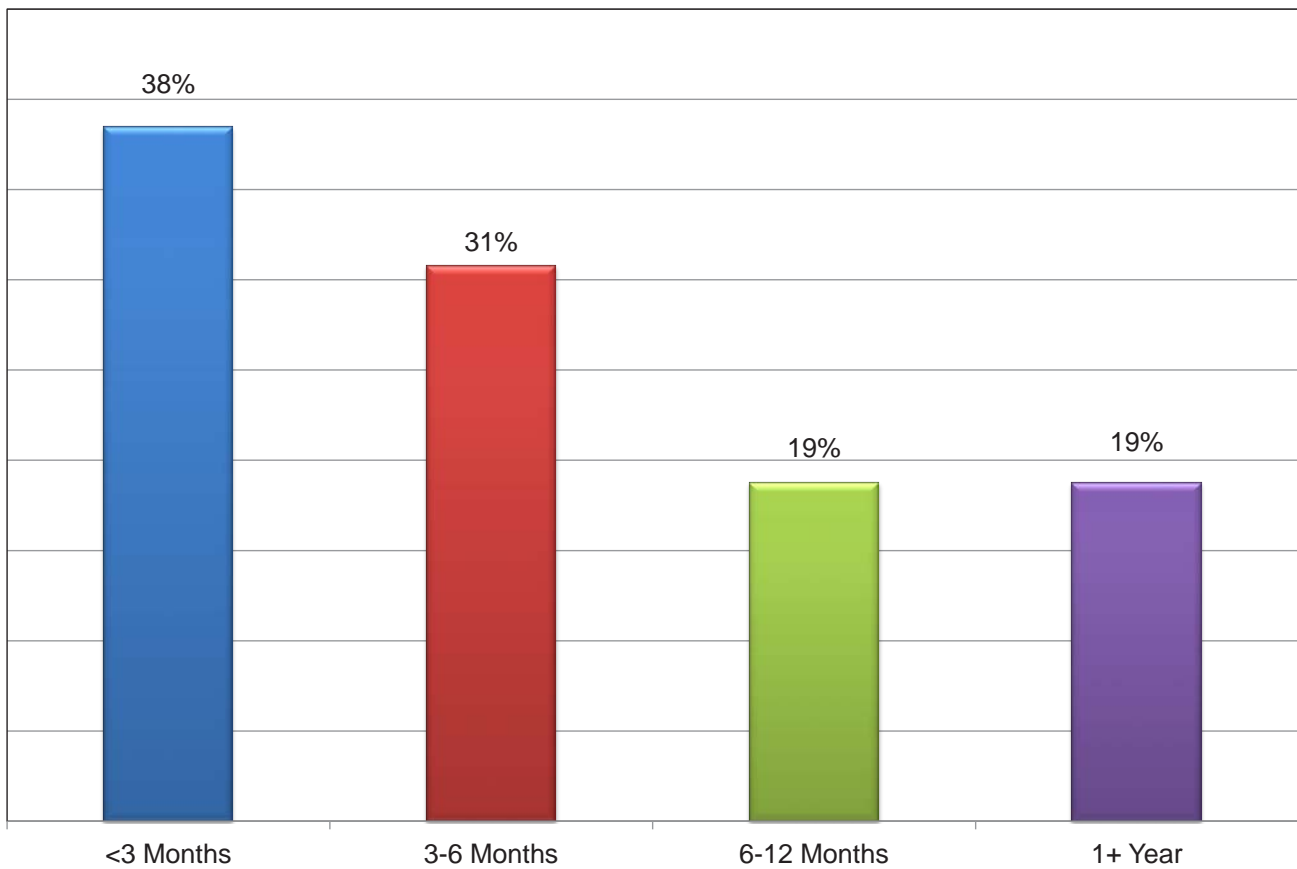


## ADP Recipients Outstanding vs. Overall Chains Started



## ADP Wait Time Analysis

As of 6/30/2017



# Program Statistics

As of 6/30/2017

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
1	Transplants Facilitated	21	62	131	175	226	308	310	360	399	207
2	Paired Transplants Facilitated	21	39	91	131	164	252	255	288	315	149
3	Chip Transplants Facilitated	0	23	40	44	62	56	55	72	84	58
4	Ending Unmatched Patient Pool	80	127	120	201	241	255	279	280	215	228
5	Cumulative Transplants	21	83	214	389	615	923	1233	1593	1992	2199
6	Cumulative Paired Transplants	21	60	150	280	526	777	1030	1316	1630	1778
7	Cumulative Chip Transplants	0	23	64	109	89	146	203	277	362	421
8	Cumulative Paired Patient Pool	101	210	334	590	805	1062	1351	1615	1877	2043
9	Percent of Pool Transplanted (Paired Recipients)	21%	40%	64%	66%	71%	76%	79%	84%	89%	89%
10	Enrolled Patient Mean Wait Time (years)	3.8	2.0	0.9	1.1	1.1	1.0	0.9	0.9	0.9	0.8
11	Transplanted Patient Mean Wait Time (months)	5.1	5.3	6.0	5.0	5.1	5.4	4.8	4.1	4.7	4.1
12	Transplanted Patient Median Wait Time (months)	5.3	5.3	3.9	2.5	3.0	3.0	2.3	2.1	2.1	2.1
13	Mean cPRA of Transplanted Patients	4.1%	25.9%	34.5%	40.3%	44.1%	54.0%	48.3%	48.9%	42.8%	44.9%
14	Number of Transplants Completed by cPRA										
15	100%	0	1	4	10	4	5	3	7	3	2
16	95-100%	0	4	12	10	29	68	41	47	39	21
17	80-95%	1	7	16	29	26	37	49	55	59	31
18	50-80%	0	5	19	27	33	46	48	42	53	21
19	0-50%	1	8	13	30	34	47	43	57	61	40
20	0%	19	37	67	69	100	105	126	152	184	92
21	Sub-total	21	62	131	175	226	308	310	360	399	207
22	Percent of Transplants Completed by cPRA										
23	100%	0%	2%	3%	6%	2%	2%	1%	2%	1%	1%
24	95-100%	0%	6%	9%	6%	13%	22%	13%	13%	10%	10%
25	80-95%	5%	11%	12%	17%	12%	12%	16%	15%	15%	15%
26	50-80%	0%	8%	15%	15%	15%	15%	15%	12%	13%	10%
27	0-50%	5%	13%	10%	17%	15%	15%	14%	16%	15%	19%
28	0%	90%	60%	51%	39%	44%	34%	41%	42%	46%	44%
29	Sub-total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
30	Number of Transplanted Patients with cPRA >80%	1	12	32	49	59	110	93	109	101	54
31	Percent of Transplanted Patients with cPRA >80%	5%	19%	24%	28%	26%	36%	30%	30%	26%	26%



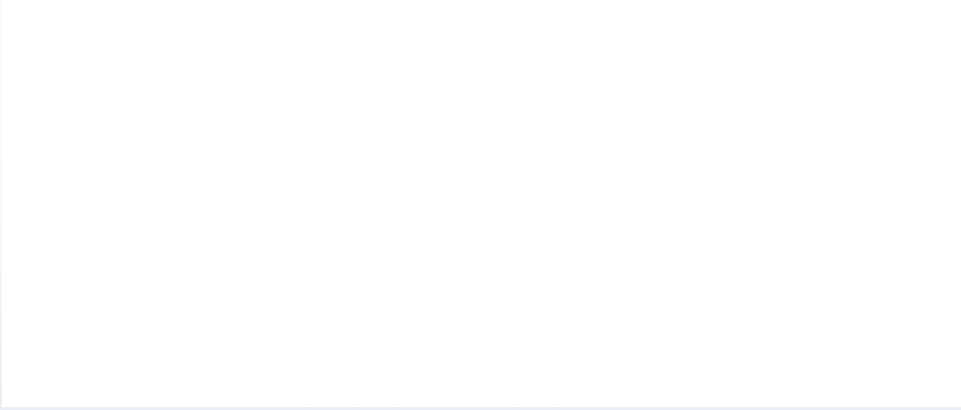
# Program Statistics

As of 6/30/2017

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
32	Number of Unmatched Patients by cPRA										
33	100%				79	73	83	81	80	80	77
34	95-99%				73	73	61	61	53	37	35
35	80-95%				15	15	24	19	22	12	14
36	50-80%				14	11	14	13	25	13	14
37	0-50%				14	10	22	37	35	28	32
38	0%				50	59	51	68	65	45	56
39	Sub-total				245	241	255	279	280	215	228
40	Percent of Unmatched Patients by cPRA										
41	100%				32%	30%	33%	29%	29%	37%	34%
42	95-99%				30%	30%	24%	22%	19%	17%	15%
43	80-95%				6%	6%	9%	7%	8%	6%	6%
44	50-80%				6%	5%	5%	5%	9%	6%	6%
45	0-50%				6%	4%	9%	13%	13%	13%	14%
46	0%				20%	24%	20%	24%	23%	21%	25%
47	Sub-total				100%	100%	100%	100%	100%	100%	100%
48	Number of Transplants Completed by Wait Time										
49	< 6 months	21	42	74	106	180	232	243	298	327	177
50	6-12 months	0	10	14	19	24	44	35	38	30	15
51	1-2 years	0	4	15	14	20	25	27	22	32	13
52	2+ years	0	0	2	2	2	7	5	2	10	2
53	Sub-total	21	56	105	141	226	308	310	360	399	207
54	Percent of Transplants Completed by Wait Time										
55	< 6 months	100%	75.0%	70.5%	75.2%	79.6%	75.3%	78.4%	82.8%	82.0%	85.5%
56	6-12 months	0.0%	17.9%	13.3%	13.5%	10.6%	14.3%	11.3%	10.6%	7.5%	7.2%
57	1-2 years	0.0%	7.1%	14.3%	9.9%	8.8%	8.1%	8.7%	6.1%	8.0%	6.3%
58	2+ years	0.0%	0.0%	1.9%	1.4%	0.9%	2.3%	1.6%	0.6%	2.5%	1.0%
59	Sub-total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
60	Total Chains Started	4	9	28	36	46	55	63	83	99	63
61	Total Loops Completed	0	3	2	3	12	24	17	15	7	10
62	Number of broken chains	3	2	2	0	4	3	4	1	2	1
63	Bridge Donors Held (2017 Annualized)	9	29	61	75	54	37	49	53	68	52
64	Percent of broken chains	33%	7%	3%	0%	7%	8%	8%	2%	3%	2%



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