



User Guide

This report contains a wide range of useful information about the liver transplant program at Hospital of the University of Pennsylvania (PAUP). The report has three main sections:

- A. Program Summary
- B. Waiting List Information
- C. Transplant Information

The Program Summary is a one-page summary highlighting characteristics of the program, including the number of candidates on the waiting list, the number of transplants performed at the program, the number of patients being cared for by the program, and patient outcomes, including outcomes while on the waiting list (the transplant rate and the death rate while on the waiting list) and outcomes after transplant (patient and graft survival probabilities). If the program performed transplants in both adults and children, survival probabilities for adults and children (pediatrics) are provided separately. For each of the outcomes measures presented, a comparison is provided showing what would be expected at this program if it were performing as similar programs around the country perform when treating similar patients. More details regarding these outcome measures are provided in Sections B and C of the report.

The Waiting List Information section contains more detailed information on how many candidates are on the waiting list at the program, the types of candidates on the waiting list, how long candidates typically have to wait for a transplant at this program, how frequently candidates successfully receive a transplant, and how often candidates on the waiting list die before receiving a transplant.

Table B1 shows the activity on this program's waiting list during two recent 1-year periods and provides comparisons to all programs within this program's OPTN region (see <http://optn.transplant.hrsa.gov/members/regions.asp> for information on OPTN regions) and the nation as a whole. Tables B2 and B3 describe the candidates on the waiting list at this program, with comparisons to candidates waiting in the same donor service area (OPO/DSA) the OPTN region, and the nation as a whole.

Table B4 shows how many candidates were removed from the waiting list because they received a transplant. The program's transplant rate is calculated as the number of candidates who received a transplant divided by the person-years observed at the program (person-years is a combination of how many candidates were on the waiting list along with how long each candidate was followed since some candidates are not on the waiting list for the entire year). The transplant rate and comparisons to what would be expected at this program are presented in Figures B1 and B2. Figure B1 shows the transplant rate compared to what was expected at this program. The expected transplant rate is an estimate of what we would expect at this program if it were performing transplants at rates similar to other programs in the US with similar candidates on their waiting lists. The expected rate is only an estimate, and is made with a certain level of uncertainty. This uncertainty is shown in Figure B2. Figure B2 displays the ratio of the observed to the expected transplant rate. A ratio of 1 indicates that the observed transplant rate was equal to the expected transplant rate, while a ratio less than 1 indicates the observed rate was lower than expected rate and a ratio greater than 1 indicates the observed rate was higher than the expected rate. However, the level of uncertainty must be considered when interpreting these numbers. The 95% interval is also shown on Figure B2. This interval provides a range within which the true ratio of observed to expected transplant rates is likely to be. If this



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confidence interval includes (crosses) 1.0, then we cannot say that this program's observed transplant rate is different from what would be expected. The observed transplant rate at this program was 97.6 per 100 person-years. Transplant rates are also provided for adult and pediatric patients separately along with comparisons to adult and pediatric rates in the DSA, the OPTN region, and the nation. Transplant rates are also presented excluding transplants from a living donor (Table B4D and Figures B1D-B3D). Please refer to the PSR Technical Methods documentation available at <http://www.srtr.org> for more detail regarding how expected rates are calculated.

The death rate (also known as the mortality rate) for candidates on the waiting list is presented in Table B5 and Figures B4-B6. These data are presented in the same way as the transplant rate data in the previous section. The intent of these tables and figures is to describe risk of death once candidates are listed rather than while they are listed. Therefore, time at risk and deaths after removal from the waiting list for reasons other than transplant, transfer to another transplant program, or recovery (no longer needing a transplant), and before any subsequent transplant, are included. As with transplant rates, mortality rates should be interpreted carefully taking into consideration the interval displayed in Figure B5. For a complete description of how observed and expected mortality rates are calculated, please refer to the technical documentation available at <http://www.srtr.org>.

Table B6 presents information on what happens to candidates on the waiting list by three different time points after listing: 6 months, 12 months, and 18 months. The table displays percentages of candidates who have died, been removed from the waiting list, been transplanted, or been transferred or lost-to-follow-up. Tables B7 and B8 provide more detail regarding how many candidates have received a deceased donor transplant by certain time points during the first 3 years after being put on the transplant waiting list. Each row of Tables B7 and B8 presents the percent of candidates who received a deceased donor transplant by each time point. Table B9 presents data on the time it took for different percentages of patients to be transplanted for candidates added to the list between 07/01/2013 and 12/31/2018. The time it took for 5% (the 5th percentile) of patients to receive a transplant at this program was 0.1 months. If "Not Observed" is displayed in the table, then too few candidates received transplants before 06/30/2019 to calculate a particular percentile of transplant times.

Table B10 contains a summary of the offer acceptance practices of the program. The offer acceptance ratio indicates whether the program is more or less likely to accept offers than the average program. If the offer acceptance ratio is greater than 1.0, then the program tends to accept more offers than average; if the offer acceptance ratio is less than 1.0, then the program tends to accept fewer offers than average. Figure B7 shows the distribution of program offer acceptance rates as well as the offer acceptance rate for this program. Figures B8 - B12 similarly show offer acceptance rates for subsets of offers.

The Transplant Information section begins with descriptions of transplant recipients in Tables C1 and C2. Data on recipients of deceased donor transplants are presented (Tables C1D and C2D); if applicable, data on recipients of living donor transplants are presented separately (Tables C1L and C2L). Comparisons to the region and the nation as a whole are provided. A description of the deceased donors used at this program is provided in Table C3D, along with characteristics of living donors in Table C3L, if applicable. Finally, information on the transplant procedure for deceased and living donor transplants is presented in Tables C4D and C4L, respectively.



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Starting with Table C5, transplant outcomes are presented along with comparisons to what would be expected at this program and what happened in the nation as a whole. Tables C5-C10 present information on graft survival (survival of the transplanted organ), with data presented separately for adult and pediatric recipients. Patients are followed from the time of transplant until either failure of the transplanted organ or death, whichever comes first. Please refer to the technical methods for more information on these calculations (<http://www.srtr.org>).

While Tables C5-C10 present data on graft survival, Tables C11-C16 present information on patient survival. For these tables, patients are followed from the time of transplant until death, regardless of whether the transplant is functioning or the patient required another transplant to survive.

Tables C17 and C18 summarize the multiorgan transplant outcomes at this program. The summary statistics in these tables are descriptive and are not risk-adjusted for different donor and candidate characteristics.

Table D1 shows the rates of follow-up for living donors.

Additional information regarding the technical methods and the risk adjustment models used to estimate expected event rates is available on the SRTR website at <http://www.srtr.org>. We welcome and encourage feedback on these reports. Please feel free to share feedback with the SRTR at the following e-mail: srtr@srtr.org.



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A. Program Summary

Figure A1. Waiting list and transplant activity

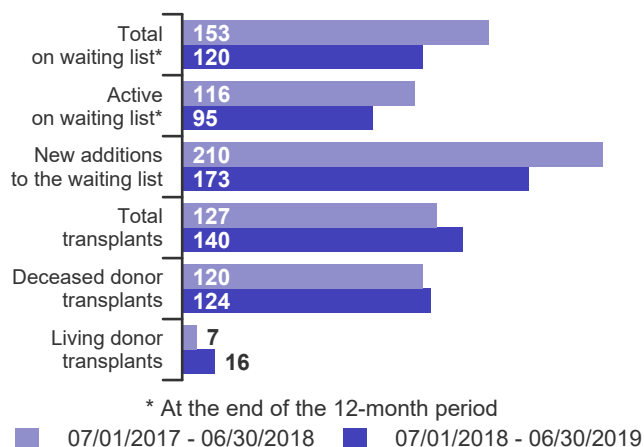


Table A1. Census of transplant recipients

Recipients	07/01/2017-06/30/2018	07/01/2018-06/30/2019
Transplanted at this center	127	140
Followed by this center*	1,246	1,227
...transplanted at this program	1,192	1,175
...transplanted elsewhere	54	52

* Recipients followed are transplant recipients for whom the center has submitted a post-transplant follow-up form for a transplant that took place before the 12-month interval for each column.

Figure A2. Transplant rates
07/01/2017 - 06/30/2019

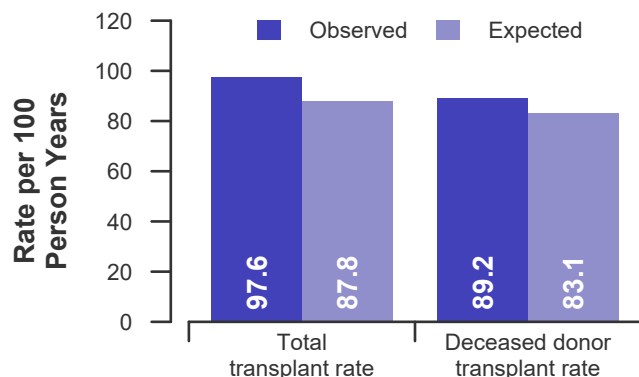


Figure A3. Waiting list mortality rates
07/01/2017 - 06/30/2019

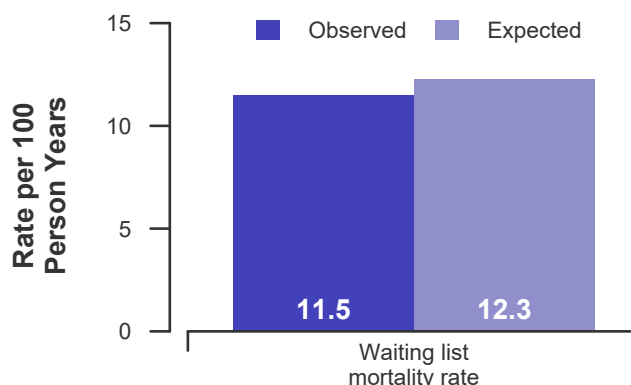


Figure A4. First-year adult graft and patient survival: 07/01/2016 - 12/31/2018

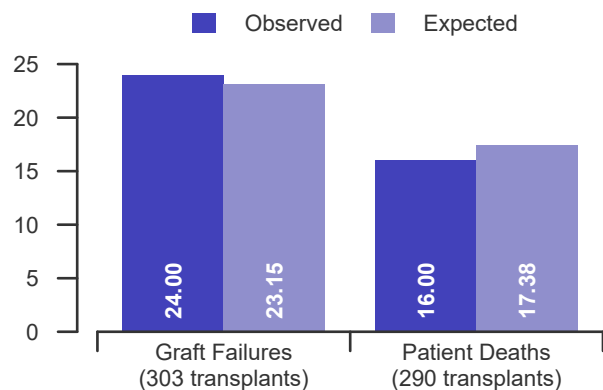


Figure A5. First-year pediatric graft and patient survival: 07/01/2016 - 12/31/2018

This center did not perform any transplants relevant to this figure during 07/01/2016-12/31/2018



B. Waiting List Information

Table B1. Waiting list activity summary: 07/01/2017 - 06/30/2019

Waiting List Registrations	Counts for this center		Activity for 07/01/2018 to 06/30/2019 as percent of registrants on waiting list on 07/01/2018		
	07/01/2017- 06/30/2018	07/01/2018- 06/30/2019	This Center (%)	OPTN Region (%)	U.S. (%)
On waiting list at start	127	153	100.0	100.0	100.0
Additions					
New listings at this center	210	173	113.1	77.0	93.1
Removals					
Transferred to another center	2	2	1.3	1.3	1.1
Received living donor transplant*	7	16	10.5	6.4	3.4
Received deceased donor transplant*	120	124	81.0	43.8	57.6
Died	6	13	8.5	8.3	8.4
Transplanted at another center	4	3	2.0	2.3	2.8
Deteriorated	23	18	11.8	7.1	8.8
Recovered	12	15	9.8	5.0	7.1
Other reasons	10	15	9.8	10.0	9.3
On waiting list at end of period	153	120	78.4	92.9	94.6

* These patients were removed from waiting list with removal code indicating transplant; this may not equal the number of transplants performed at this center during the specified period.



B. Waiting List Information

Table B2. Demographic characteristics of waiting list candidates**Candidates registered on the waiting list between 07/01/2018 and 06/30/2019**

Demographic Characteristic	New Waiting List Registrations 07/01/2018 to 06/30/2019 (%)			All Waiting List Registrations on 06/30/2019 (%)		
	This Center (N=173)	OPTN Region (N=1,524)	U.S. (N=13,078)	This Center (N=120)	OPTN Region (N=1,838)	U.S. (N=13,297)
All (%)	100.0	100.0	100.0	100.0	100.0	100.0
Ethnicity/Race (%)*						
White	77.5	75.2	68.9	69.2	74.4	67.6
African-American	13.9	12.5	7.7	20.8	14.6	7.5
Hispanic/Latino	5.2	7.7	16.9	5.0	7.0	17.9
Asian	2.9	4.1	4.7	4.2	3.8	5.6
Other	0.6	0.5	1.7	0.8	0.3	1.4
Unknown	0.0	0.0	0.0	0.0	0.0	0.0
Age (%)						
<2 years	0.0	3.0	2.5	0.0	1.6	1.2
2-11 years	0.0	2.0	1.7	0.0	2.0	1.2
12-17 years	0.6	1.0	1.1	1.7	1.1	1.1
18-34 years	10.4	5.4	6.2	5.8	5.5	6.1
35-49 years	12.1	15.5	17.2	17.5	18.3	18.6
50-64 years	56.6	50.5	49.7	58.3	53.1	53.4
65-69 years	16.8	17.4	16.8	13.3	14.7	15.0
70+ years	3.5	5.1	4.8	3.3	3.6	3.4
Gender (%)						
Male	61.3	64.4	61.7	65.0	60.9	60.3
Female	38.7	35.6	38.3	35.0	39.1	39.7

* Race and ethnicity are reported together as a single data element, reflecting their data collection (either race or ethnicity is required, but not both). Patients formerly coded as white and Hispanic are coded as Hispanic. Race and ethnicity sum to 100%.



B. Waiting List Information

Table B3. Medical characteristics of waiting list candidates

Candidates registered on the waiting list between 07/01/2018 and 06/30/2019

Medical Characteristic	New Waiting List Registrations 07/01/2018 to 06/30/2019 (%)			All Waiting List Registrations on 06/30/2019 (%)		
	This Center (N=173)	OPTN Region (N=1,524)	U.S. (N=13,078)	This Center (N=120)	OPTN Region (N=1,838)	U.S. (N=13,297)
All (%)	100.0	100.0	100.0	100.0	100.0	100.0
Blood Type (%)						
O	38.7	42.3	46.4	48.3	46.8	48.8
A	37.0	37.6	37.1	39.2	37.8	38.5
B	17.9	15.4	12.6	9.2	13.1	10.5
AB	6.4	4.7	3.9	3.3	2.2	2.2
Unknown	0.0	0.0	0.0	0.0	0.0	0.0
Previous Transplant (%)						
Yes	5.8	3.1	4.6	1.7	2.6	3.1
No	94.2	96.9	95.4	98.3	97.4	96.9
Unknown	0.0	0.0	0.0	0.0	0.0	0.0
Primary Disease (%)						
Acute Hepatic Necrosis	5.8	5.2	4.3	2.5	1.9	1.7
Non-Cholestatic Cirrhosis	63.0	68.9	66.1	68.3	74.9	71.7
Cholestatic Liver Disease/Cirrhosis	8.1	5.2	7.0	4.2	6.5	7.6
Biliary Atresia	0.0	2.2	2.3	0.0	1.4	1.7
Metabolic Diseases	3.5	2.6	2.5	2.5	2.0	1.6
Malignant Neoplasms	11.6	9.6	12.3	11.7	7.1	10.1
Other	8.1	5.2	5.3	10.8	5.5	5.3
Missing	0.0	1.0	0.2	0.0	0.7	0.1
Medical Urgency Status/MELD/PELD at Listing (%)*						
Status 1A	2.9	3.7	3.2	0.0	0.5	0.3
Status 1B	0.0	0.3	0.4	0.0	0.1	0.1
Status 2A	0.0	0.0	0.0	0.0	0.0	0.0
Status 2B	0.0	0.0	0.0	0.0	0.2	0.1
Status 3	0.0	0.0	0.0	0.0	0.7	0.6
MELD 6-10	22.5	21.1	18.4	38.3	36.6	29.0
MELD 11-14	17.9	18.7	18.8	21.7	28.2	29.1
MELD 15-20	27.7	18.9	23.4	31.7	19.8	24.9
MELD 21-30	17.9	17.8	17.7	5.8	7.3	8.9
MELD 31-40	9.8	11.4	10.9	0.8	0.7	0.7
PELD less than or equal to 10	0.0	2.2	1.8	0.0	2.7	1.7
PELD 11-14	0.0	0.4	0.2	0.0	0.4	0.1
PELD 15-20	0.0	0.9	0.6	0.0	0.1	0.2
PELD 21-30	0.0	0.5	0.3	0.0	0.2	0.2
PELD 31 or greater	0.0	0.1	0.1	0.0	0.0	0.0
Temporarily Inactive	1.2	4.1	4.1	1.7	2.5	4.1

* MELD/PELD score based on laboratory measures is shown for listings beginning 2/27/2002 unless patient is Status 1 or Temporarily Inactive. MELD/PELD scores based on exception rules are not used. Status 1 separated into 1A and 1B in August 2005.



B. Waiting List Information

Table B4. Transplant rates: 07/01/2017 - 06/30/2019

Waiting List Registrations	This Center	OPO/DSA	Region	U.S.
All Candidates				
Count on waiting list at start*	127	463	2,058	14,609
Person Years**	273.7	932.8	3,873.0	27,909.4
Removals for Transplant	267	733	1,951	16,709
Adult (18+) Candidates				
Count on waiting list at start*	127	450	1,952	14,044
Person Years**	272.4	899.9	3,683.9	26,858.2
Removals for transplant	267	694	1,804	15,524
Pediatric (<18) Candidates				
Count on waiting list at start*	0	13	106	565
Person Years**	1.3	32.9	189.1	1,051.2
Removals for transplant	0	39	147	1,185

* Counts in this table may be lower than similar counts in other waiting list tables, such as Table B1. A small percentage (~1%) of patients are found to have died or been transplanted before being removed from the waiting list, so these patients are excluded if the event occurs prior to the start of the study period. Inactive time on the waiting list is included in the calculations for this table.

** Person years are calculated as days (converted to fractional years). The number of days from July 1 or from the date of first wait listing until death, transplant, removal from the waiting list or June 30.

Figure B1. Observed and expected transplant rates: 07/01/2017 - 06/30/2019

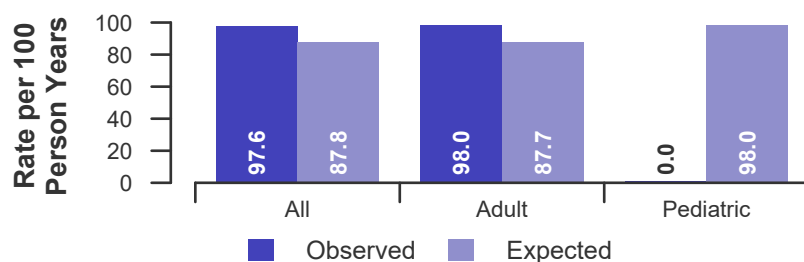


Figure B2. Transplant rate ratio estimate

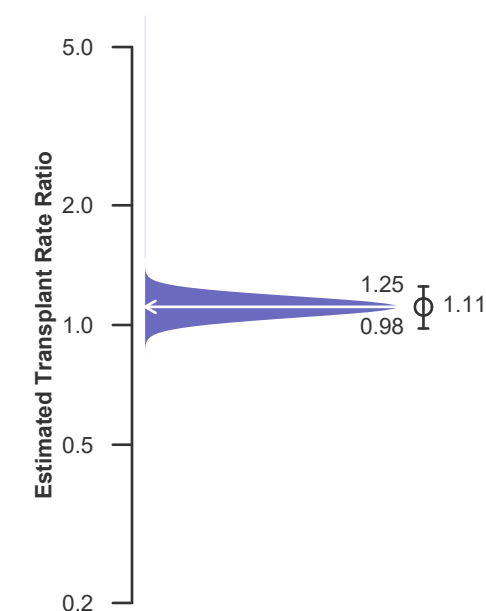
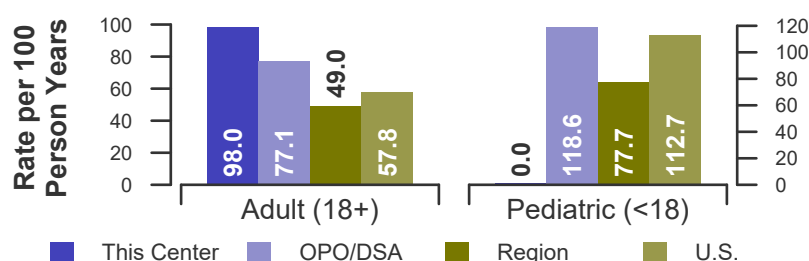


Figure B3. Observed adult (18+) and pediatric (<18) transplant rates: 07/01/2017 - 06/30/2019





B. Waiting List Information

Table B4D. Deceased donor transplant rates: 07/01/2017 - 06/30/2019

Waiting List Registrations	This Center	OPO/DSA	Region	U.S.
All Candidates				
Count on waiting list at start*	127	463	2,058	14,609
Person Years**	273.7	932.8	3,873.0	27,909.4
Removals for Transplant	244	702	1,729	15,877
Adult (18+) Candidates				
Count on waiting list at start*	127	450	1,952	14,044
Person Years**	272.4	899.9	3,683.9	26,858.2
Removals for transplant	244	670	1,617	14,819
Pediatric (<18) Candidates				
Count on waiting list at start*	0	13	106	565
Person Years**	1.3	32.9	189.1	1,051.2
Removals for transplant	0	32	112	1,058

* Counts in this table may be lower than similar counts in other waiting list tables, such as Table B1. A small percentage (~1%) of patients are found to have died or been transplanted before being removed from the waiting list, so these patients are excluded if the event occurs prior to the start of the study period. Inactive time on the waiting list is included in the calculations for this table.

** Person years are calculated as days (converted to fractional years). The number of days from July 1 or from the date of first wait listing until death, transplant, removal from the waiting list or June 30.

Figure B1D. Observed and expected deceased donor transplant rates: 07/01/2017 - 06/30/2019

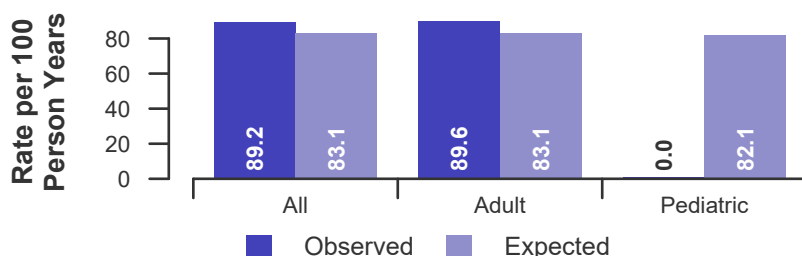


Figure B2D. Deceased donor transplant rate ratio estimate

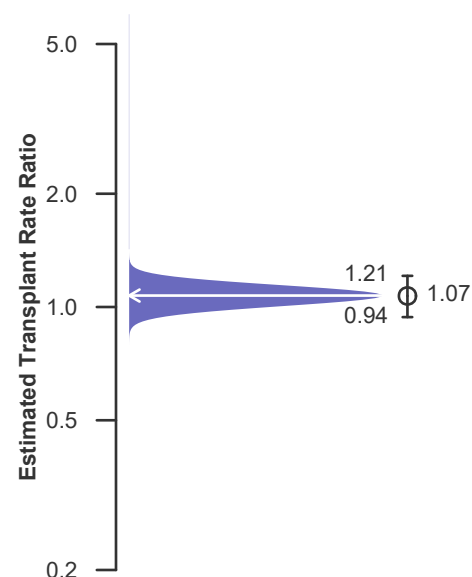
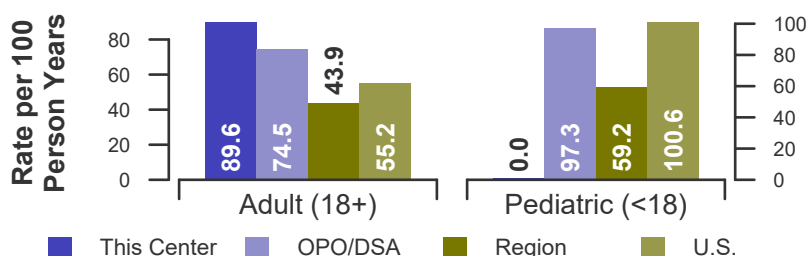


Figure B3D. Observed adult (18+) and pediatric (<18) deceased donor transplant rates: 07/01/2017 - 06/30/2019





B. Waiting List Information

Table B5. Waiting list mortality rates: 07/01/2017 - 06/30/2019

Waiting List Registrations	This Center	OPO/DSA	Region	U.S.
All Candidates				
Count on waiting list at start*	127	463	2,058	14,609
Person Years**	321.6	1,136.6	4,467.3	32,169.8
Number of deaths	37	142	487	3,824
Adult (18+) Candidates				
Count on waiting list at start*	127	450	1,952	14,044
Person Years**	320.3	1,102.7	4,253.2	31,017.3
Number of deaths	37	142	484	3,757
Pediatric (<18) Candidates				
Count on waiting list at start*	0	13	106	565
Person Years**	1.3	33.9	214.1	1,152.5
Number of deaths	0	0	3	67

* Counts in this table may be lower than similar counts in other waiting list tables, such as Table B1. A small percentage (~1%) of patients are found to have died or been transplanted before being removed from the waiting list, so these patients are excluded if the event occurs prior to the start of the study period. Inactive time on the waiting list is included in the calculations for this table.

** Person years are calculated as days (converted to fractional years). The number of days from July 1 or from the date of first wait listing until death, transplant, 60 days after recovery, transfer or June 30.

Figure B4. Observed and expected waiting list mortality rates: 07/01/2017 - 06/30/2019

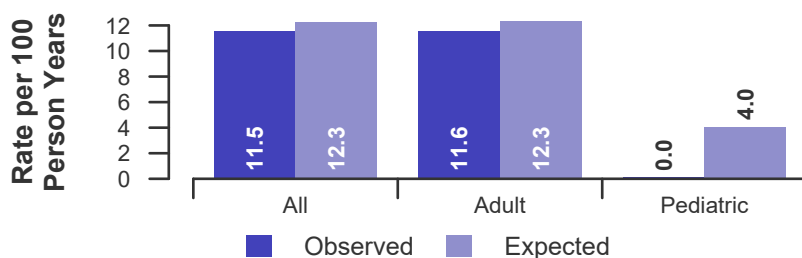


Figure B5. Waiting list mortality rate ratio estimate

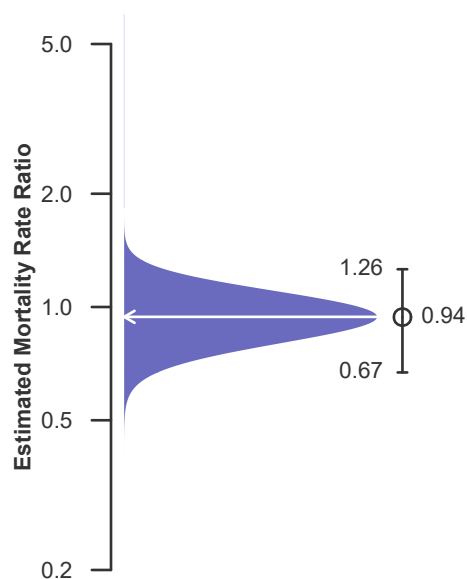
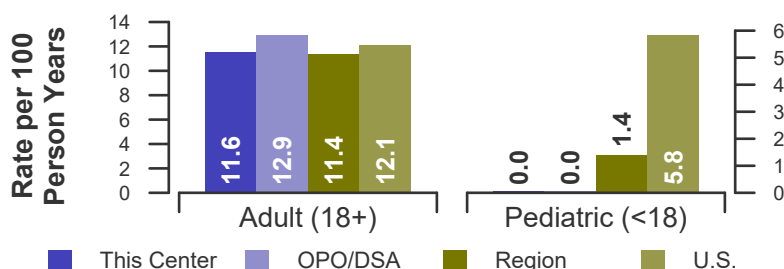


Figure B6. Observed adult (18+) and pediatric (<18) waiting list mortality rates: 07/01/2017 - 06/30/2019





B. Waiting List Information

Table B6. Waiting list candidate status after listing

Candidates registered on waiting list between 01/01/2017 and 12/31/2017

Waiting list status (survival status)	This Center (N=192)			U.S. (N=12,947)		
	Months Since Listing			Months Since Listing		
	6	12	18	6	12	18
Alive on waiting list (%)	50.5	24.0	14.1	47.6	27.7	18.4
Died on the waiting list without transplant (%)	2.6	2.6	3.1	4.7	6.2	7.0
Removed without transplant (%):						
Condition worsened (status unknown)	4.2	8.3	8.9	4.4	6.5	7.5
Condition improved (status unknown)	0.0	1.6	2.6	1.1	1.8	2.6
Refused transplant (status unknown)	0.0	0.0	0.0	0.2	0.5	0.6
Other	0.5	1.6	5.7	1.7	3.2	4.4
Transplant (living donor from waiting list only) (%):						
Functioning (alive)	2.6	2.6	1.6	1.7	2.3	1.6
Failed-Retransplanted (alive)	0.0	0.0	0.0	0.0	0.1	0.1
Failed-alive not retransplanted	0.0	0.0	0.0	0.0	0.0	0.0
Died	0.0	0.0	0.0	0.0	0.1	0.1
Status Yet Unknown**	0.0	0.0	1.6	0.0	0.1	0.8
Transplant (deceased donor) (%):						
Functioning (alive)	36.5	52.1	39.1	34.2	42.9	35.0
Failed-Retransplanted (alive)	0.5	0.5	0.5	0.3	0.4	0.6
Failed-alive not retransplanted	0.0	0.0	0.0	0.0	0.0	0.0
Died	1.0	3.1	3.1	1.8	2.9	3.7
Status Yet Unknown*	1.0	3.1	18.8	1.8	4.7	16.7
Lost or Transferred (status unknown) (%)	0.5	0.5	1.0	0.3	0.6	0.8
TOTAL (%)	100.0	100.0	100.0	100.0	100.0	100.0
Total % known died on waiting list or after transplant	3.6	5.7	6.2	6.5	9.2	10.8
Total % known died or removed as unstable	7.8	14.1	15.1	11.0	15.7	18.3
Total % removed for transplant	41.7	61.5	64.6	39.8	53.3	58.7
Total % with known functioning transplant (alive)	39.1	54.7	40.6	35.9	45.1	36.6

* Follow-up form covering specified time period not yet completed, and possibly has not become due.



B. Waiting List Information

Table B6S1. Medical urgency status 1 candidate status after listing

Candidates registered on the waiting list between 01/01/2017 and 12/31/2017

Waiting list status (survival status)	This Center (N=2)			U.S. (N=445)		
	Months Since listing			Months Since listing		
	6	12	18	6	12	18
Alive on waiting list (%)	0.0	0.0	0.0	5.2	2.7	2.0
Died on the waiting list without transplant (%)	0.0	0.0	0.0	6.3	6.3	6.3
Removed without transplant (%):						
Condition worsened (status unknown)	0.0	0.0	0.0	5.4	5.4	5.4
Condition improved (status unknown)	0.0	0.0	0.0	16.6	18.4	18.9
Refused transplant (status unknown)	0.0	0.0	0.0	0.2	0.2	0.2
Other	0.0	0.0	0.0	0.4	0.7	0.9
Transplant (living donor from waiting list only) (%):						
Functioning (alive)	0.0	0.0	0.0	0.9	0.9	0.9
Failed-Retransplanted (alive)	0.0	0.0	0.0	0.0	0.0	0.0
Failed-alive not retransplanted	0.0	0.0	0.0	0.0	0.0	0.0
Died	0.0	0.0	0.0	0.2	0.2	0.2
Status Yet Unknown**	0.0	0.0	0.0	0.0	0.0	0.0
Transplant (deceased donor) (%):						
Functioning (alive)	50.0	50.0	50.0	55.7	50.1	39.1
Failed-Retransplanted (alive)	50.0	50.0	50.0	1.3	1.3	1.6
Failed-alive not retransplanted	0.0	0.0	0.0	0.2	0.0	0.0
Died	0.0	0.0	0.0	5.6	7.0	7.0
Status Yet Unknown*	0.0	0.0	0.0	1.1	5.8	16.6
Lost or Transferred (status unknown) (%)	0.0	0.0	0.0	0.7	0.9	0.9
TOTAL (%)	100.0	100.0	100.0	100.0	100.0	100.0
Total % known died on waiting list or after transplant	0.0	0.0	0.0	12.1	13.5	13.5
Total % known died or removed as unstable	0.0	0.0	0.0	17.5	18.9	18.9
Total % removed for transplant	100.0	100.0	100.0	65.2	65.4	65.4
Total % with known functioning transplant (alive)	50.0	50.0	50.0	56.6	51.0	40.0

* Follow-up form covering specified time period not yet completed, and possibly has not become due.



B. Waiting List Information

Table B7. Percent of candidates with deceased donor transplants: demographic characteristics
Candidates registered on the waiting list between 07/01/2013 and 06/30/2016

Characteristic	Percent transplanted at time periods since listing									
	This Center					United States				
	N	30 day	1 year	2 years	3 years	N	30 day	1 year	2 years	3 years
All	468	25.0	60.3	69.2	70.5	35,521	17.7	45.2	53.0	54.9
Ethnicity/Race*										
White	335	26.6	60.3	68.4	69.3	24,197	17.4	45.9	53.3	55.1
African-American	87	25.3	62.1	73.6	74.7	3,480	21.8	50.2	57.7	59.7
Hispanic/Latino	21	14.3	66.7	71.4	76.2	5,593	16.9	40.8	49.3	51.4
Asian	23	13.0	47.8	65.2	69.6	1,731	15.6	40.0	51.8	54.1
Other	2	0.0	50.0	50.0	50.0	520	17.5	44.0	52.5	54.2
Unknown	0	--	--	--	--	0	--	--	--	--
Age										
<2 years	0	--	--	--	--	865	24.3	70.4	75.4	76.6
2-11 years	0	--	--	--	--	717	25.2	67.5	72.5	73.8
12-17 years	3	100.0	100.0	100.0	100.0	438	21.9	54.3	64.4	66.2
18-34 years	38	26.3	55.3	60.5	65.8	1,957	26.6	48.4	54.3	56.8
35-49 years	68	23.5	63.2	70.6	72.1	5,448	24.3	47.3	53.3	55.1
50-64 years	275	25.1	58.2	66.9	68.0	20,147	15.7	43.4	51.9	53.9
65-69 years	76	19.7	64.5	77.6	77.6	4,880	13.3	41.0	50.2	51.8
70+ years	8	50.0	75.0	87.5	87.5	1,069	12.3	41.4	48.6	48.7
Gender										
Male	312	24.7	60.9	71.5	72.8	22,582	17.3	46.3	54.6	56.4
Female	156	25.6	59.0	64.7	66.0	12,939	18.3	43.2	50.3	52.3

* Race and ethnicity are reported together as a single data element, reflecting their data collection (either race or ethnicity is required, but not both). Patients formerly coded as white and Hispanic are coded as Hispanic. Race and ethnicity sum to 100%.



B. Waiting List Information

Table B8. Percent of candidates with deceased donor transplants: medical characteristics
Candidates registered on the waiting list between 07/01/2013 and 06/30/2016

Characteristic	N	Percent transplanted at time periods since listing									
		This Center				N	United States				
		30 day	1 year	2 years	3 years		30 day	1 year	2 years	3 years	
All	468	25.0	60.3	69.2	70.5	35,521	17.7	45.2	53.0	54.9	
Blood Type											
O	208	24.0	59.1	67.3	69.7	16,547	17.4	43.4	51.3	53.3	
A	176	22.7	54.5	65.9	65.9	13,081	16.2	43.2	51.7	53.3	
B	60	26.7	71.7	80.0	80.0	4,572	19.7	51.4	58.4	60.5	
AB	24	45.8	83.3	83.3	87.5	1,321	28.9	65.8	70.2	71.8	
Previous Transplant											
Yes	31	38.7	74.2	77.4	77.4	1,990	27.4	50.1	54.8	56.2	
No	437	24.0	59.3	68.6	70.0	33,531	17.1	44.9	52.9	54.8	
Primary Disease											
Acute Hepatic Necrosis	12	75.0	83.3	83.3	83.3	1,378	48.1	55.7	58.1	58.9	
Non-Cholestatic Cirrhosis	341	25.5	61.6	71.0	72.1	23,993	17.5	43.0	50.0	51.7	
Cholestatic Liver Disease/Cirrhosis	45	31.1	66.7	71.1	73.3	2,444	15.0	45.6	53.8	57.2	
Biliary Atresia	2	0.0	100.0	100.0	100.0	723	16.7	64.7	72.8	74.4	
Metabolic Diseases	10	30.0	60.0	60.0	60.0	882	21.0	61.5	67.9	69.5	
Malignant Neoplasms	45	8.9	42.2	57.8	60.0	4,216	8.6	46.6	61.1	63.0	
Other	13	0.0	38.5	46.2	46.2	1,871	19.5	47.3	55.3	57.5	
Missing	0	--	--	--	--	14	7.1	7.1	7.1	7.1	
Medical Urgency Status/MELD/PELD at Listing*											
Status 1	0	--	--	--	--	0	--	--	--	--	
Status 1A	7	100.0	100.0	100.0	100.0	1,168	61.0	61.7	61.7	61.7	
Status 1B	0	--	--	--	--	145	49.7	83.4	83.4	83.4	
Status 2A	0	--	--	--	--	0	--	--	--	--	
Status 2B	0	--	--	--	--	0	--	--	--	--	
Status 3	0	--	--	--	--	0	--	--	--	--	
MELD 6-10	103	1.0	40.8	64.1	66.0	7,069	3.1	34.8	49.3	51.8	
MELD 11-14	89	10.1	51.7	60.7	61.8	6,591	2.9	29.8	40.6	43.7	
MELD 15-20	107	11.2	56.1	61.7	64.5	8,145	7.6	39.8	47.9	50.4	
MELD 21-30	109	42.2	73.4	77.1	77.1	6,006	26.3	57.3	60.3	61.1	
MELD 31-40	52	80.8	88.5	88.5	88.5	3,894	66.7	73.1	73.2	73.2	
PELD less than or equal to 10	0	--	--	--	--	682	10.6	66.1	74.0	76.0	
PELD 11-14	0	--	--	--	--	109	17.4	74.3	79.8	79.8	
PELD 15-20	0	--	--	--	--	176	12.5	73.9	79.0	81.2	
PELD 21-30	0	--	--	--	--	154	24.0	71.4	76.0	76.0	
PELD 31 or greater	0	--	--	--	--	63	55.6	74.6	74.6	76.2	
Temporarily Inactive	1	0.0	100.0	100.0	100.0	1,319	7.8	33.3	42.7	43.8	

* MELD/PELD score based on laboratory measures is shown for listings beginning 2/27/2002 unless patient is Status 1 or Temporarily Inactive. MELD/PELD scores based on exception rules are not used. Status 1 separated into 1A and 1B in August 2005.



B. Waiting List Information

Table B9. Time to transplant for waiting list candidates*

Candidates registered on the waiting list between 07/01/2013 and 12/31/2018

Percentile	Center	Months to Transplant**		U.S.
		OPO/DSA	Region	
5th	0.1	0.1	0.2	0.2
10th	0.2	0.3	0.3	0.3
25th	1.0	2.4	2.5	1.9
50th (median time to transplant)	7.3	11.4	12.4	10.7
75th	Not Observed	Not Observed	Not Observed	Not Observed

* If cells contain "Not Observed" fewer than that percentile of patients had received a transplant. For example, the 50th percentile of time to transplant is the time when 50% of candidates have received transplants. If waiting times are long, then the 50th percentile may not be observed during the follow-up period for this table. Also, if more than 50% of candidates are removed from the list due to death or other reasons before receiving transplants, then the 50th percentile of time to transplant will not be observed.

** Censored on 06/30/2019. Calculated as the months after listing, during which the corresponding percent of all patients initially listed had received a transplant.



B. Waiting List Information

Table B10. Offer Acceptance Practices: 07/01/2018 - 06/30/2019

Offers Acceptance Characteristics	This Center	OPO/DSA	Region	U.S.
Overall				
Number of Offers	1,947	6,107	20,420	159,899
Number of Acceptances	116	335	791	7,258
Expected Acceptances	89.8	367.6	818.0	7,255.2
Offer Acceptance Ratio*	1.29	0.91	0.97	1.00
95% Credible Interval**	[1.06, 1.53]	--	--	--
PHS increased infectious risk				
Number of Offers	399	1,457	4,477	39,142
Number of Acceptances	43	120	261	2,073
Expected Acceptances	31.4	133.9	254.5	2,072.3
Offer Acceptance Ratio*	1.35	0.90	1.03	1.00
95% Credible Interval**	[0.98, 1.77]	--	--	--
DCD donor				
Number of Offers	632	1,441	5,012	37,177
Number of Acceptances	0	8	28	587
Expected Acceptances	6.3	20.2	58.6	594.5
Offer Acceptance Ratio*	0.24	0.45	0.49	0.99
95% Credible Interval**	[0.03, 0.67]	--	--	--
HCV+ donor				
Number of Offers	60	293	687	6,060
Number of Acceptances	7	27	56	412
Expected Acceptances	7.7	53.2	84.3	411.6
Offer Acceptance Ratio*	0.93	0.53	0.67	1.00
95% Credible Interval**	[0.43, 1.63]	--	--	--
Hard-to-Place Livers (Over 50 Offers)				
Number of Offers	1,010	2,561	10,404	87,459
Number of Acceptances	8	15	30	566
Expected Acceptances	8.0	25.6	69.9	572.4
Offer Acceptance Ratio*	1.00	0.62	0.45	0.99
95% Credible Interval**	[0.48, 1.71]	--	--	--
Donor more than 500 miles away				
Number of Offers	438	996	4,391	45,589
Number of Acceptances	1	7	19	705
Expected Acceptances	1.5	9.3	29.2	650.4
Offer Acceptance Ratio*	0.87	0.80	0.67	1.08
95% Credible Interval**	[0.18, 2.09]	--	--	--

* The offer acceptance ratio estimates the relative offer acceptance practice of Hospital of the University of Pennsylvania (PAUP) compared to the national offer acceptance practice. A ratio above one indicates the program is more likely to accept an offer compared to national offer acceptance practices (e.g., an offer acceptance ratio of 1.25 indicates a 25% more likely to accept an offer), while a ratio below one indicates the program is less likely to accept an offer compared to national offer acceptance practices (e.g., an offer acceptance ratio of 0.75 indicates a 25% less likely to accept an offer).

** As an example, the 95% Credible Interval for the overall offer acceptance ratio, [1.06, 1.53], indicates the location of PAUP's true offer acceptance ratio with 95% probability. The best estimate is 29% more likely to accept an offer compared to national acceptance behavior, but PAUP's performance could plausibly range from 6% higher acceptance up to 53% higher acceptance.



B. Waiting List Information

Figure B7. Offer acceptance: Overall

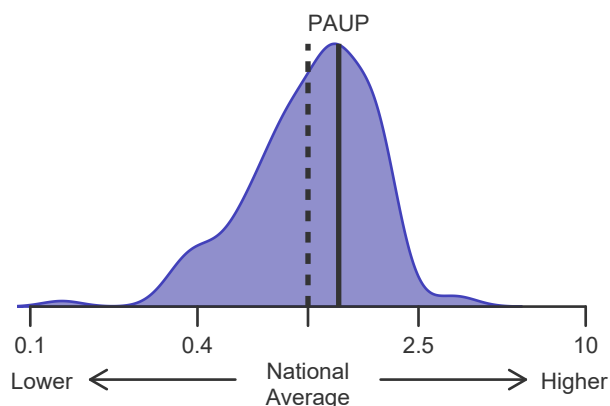


Figure B8. Offer acceptance: PHS increased infectious risk

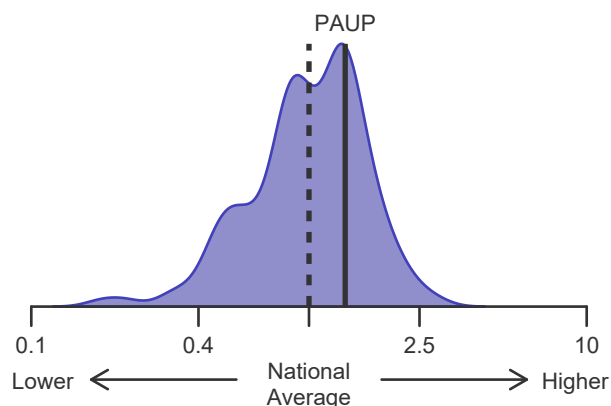


Figure B9. Offer acceptance: DCD Donor

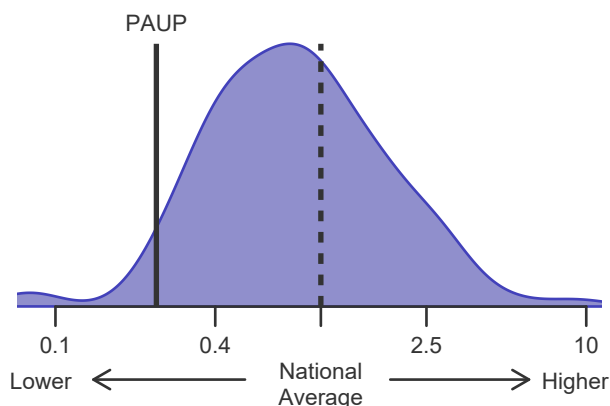


Figure B10. Offer acceptance: HCV+ Donor

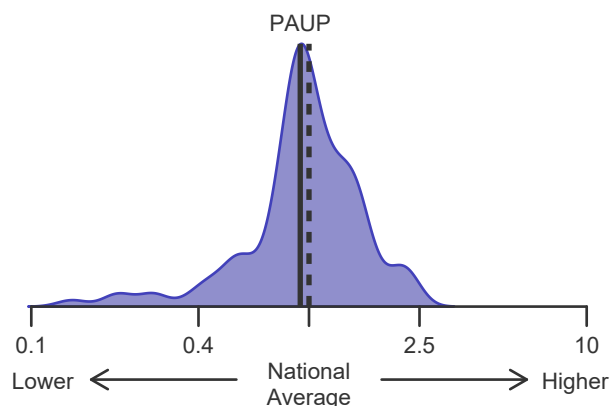


Figure B11. Offer acceptance: Offer number > 50

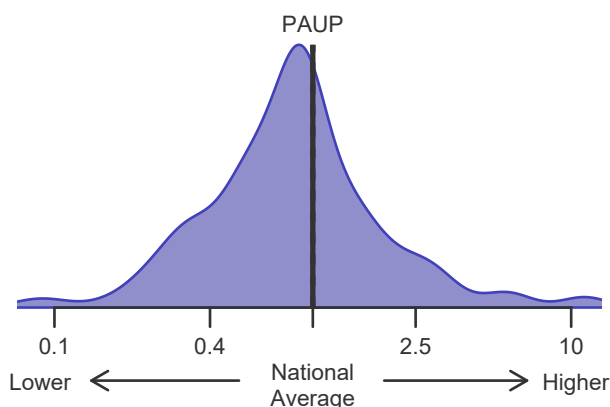
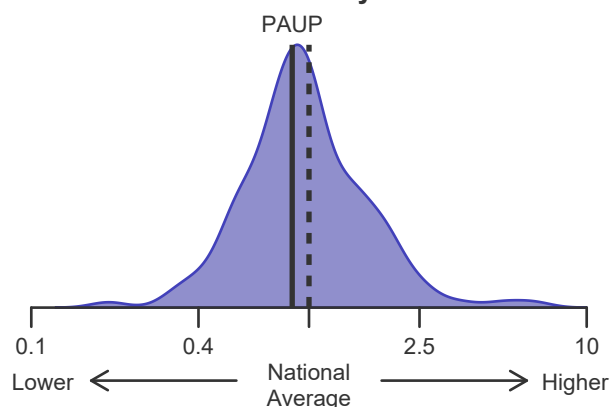


Figure B12. Offer acceptance: Donor more than 500 miles away





C. Transplant Information

Table C1D. Deceased donor transplant recipient demographic characteristics

Patients transplanted between 07/01/2018 and 06/30/2019

Characteristic	Percentage in each category		
	Center (N=124)	Region (N=866)	U.S. (N=8,093)
Ethnicity/Race (%)*			
White	77.4	73.2	68.2
African-American	8.1	14.3	8.5
Hispanic/Latino	8.1	8.3	17.0
Asian	6.5	3.7	4.8
Other	0.0	0.5	1.6
Unknown	0.0	0.0	0.0
Age (%)			
<2 years	0.0	3.6	2.5
2-11 years	0.0	2.8	2.3
12-17	0.0	0.8	1.0
18-34	8.1	7.4	6.6
35-49 years	11.3	14.5	16.7
50-64 years	53.2	48.6	49.4
65-69 years	24.2	17.3	16.6
70+ years	3.2	5.0	5.0
Gender (%)			
Male	69.4	68.0	63.4
Female	30.6	32.0	36.6

* Race and ethnicity are reported together as a single data element, reflecting their data collection (either race or ethnicity is required, but not both). Patients formerly coded as white and Hispanic are coded as Hispanic. Race and ethnicity sum to 100%.



C. Transplant Information

Table C1L. Living donor transplant recipient demographic characteristics

Patients transplanted between 07/01/2018 and 06/30/2019

Characteristic	Percentage in each category		
	Center (N=16)	Region (N=127)	U.S. (N=473)
Ethnicity/Race (%)*			
White	93.8	88.2	78.2
African-American	6.2	4.7	3.6
Hispanic/Latino	0.0	3.9	12.9
Asian	0.0	1.6	3.2
Other	0.0	1.6	2.1
Unknown	0.0	0.0	0.0
Age (%)			
<2 years	0.0	10.2	8.7
2-11 years	0.0	5.5	4.9
12-17	0.0	0.0	0.6
18-34	25.0	10.2	8.2
35-49 years	12.5	11.0	18.8
50-64 years	25.0	38.6	38.9
65-69 years	31.2	18.9	16.1
70+ years	6.2	5.5	3.8
Gender (%)			
Male	56.2	57.5	53.9
Female	43.8	42.5	46.1

* Race and ethnicity are reported together as a single data element, reflecting their data collection (either race or ethnicity is required, but not both). Patients formerly coded as white and Hispanic are coded as Hispanic. Race and ethnicity sum to 100%.



C. Transplant Information

Table C2D. Deceased donor transplant recipient medical characteristics
Patients transplanted between 07/01/2018 and 06/30/2019

Characteristic	Percentage in each category		
	Center (N=124)	Region (N=866)	U.S. (N=8,093)
Blood Type (%)			
O	38.7	41.2	44.8
A	33.9	36.3	35.8
B	20.2	16.6	14.3
AB	7.3	5.9	5.0
Previous Transplant (%)			
Yes	7.3	3.8	5.0
No	92.7	96.2	95.0
Body Mass Index (%)			
0-20	8.1	12.6	11.9
21-25	29.0	24.4	26.8
26-30	31.5	32.1	30.7
31-35	18.5	16.2	17.8
36-40	9.7	9.2	8.6
41+	3.2	3.2	3.2
Unknown	0.0	2.3	1.0
Primary Disease (%)			
Acute Hepatic Necrosis	6.5	6.2	4.7
Non-Cholestatic Cirrhosis	40.3	58.5	62.3
Cholestatic Liver Disease/Cirrhosis	7.3	4.6	7.1
Biliary Atresia	0.0	2.5	2.4
Metabolic Diseases	1.6	4.2	3.2
Malignant Neoplasms	39.5	20.4	16.5
Other	4.8	3.3	3.7
Missing	0.0	0.1	0.1
Medical Urgency Statust/MELD/PELD at Transplant (%)*			
Status 1A	4.0	4.5	3.4
Status 1B	0.0	2.5	1.5
MELD 6-10	24.2	19.4	14.4
MELD 11-14	16.9	12.9	13.1
MELD 15-20	19.4	13.3	20.2
MELD 21-30	24.2	19.7	23.0
MELD 31-40	11.3	24.5	21.4
PELD less than or equal to 10	0.0	1.5	1.4
PELD 11-14	0.0	0.5	0.4
PELD 15-20	0.0	0.5	0.6
PELD 21-30	0.0	0.7	0.3
PELD 31 or greater	0.0	0.0	0.2
Temporarily Inactive	0.0	0.0	0.0
Recipient Medical Condition at Transplant (%)			
Not Hospitalized	71.8	63.5	65.9
Hospitalized	24.2	23.2	18.5
ICU	4.0	12.9	15.5
Unknown	0.0	0.3	0.2

* MELD/PELD score based on laboratory measures at the time of transplant is shown unless recipient is Status 1 or Temporarily Inactive. MELD/PELD scores based on exception rules are not used. Status 1 separated into 1A and 1B in August 2005



C. Transplant Information

Table C2L. Living donor transplant recipient medical characteristics
Patients transplanted between 07/01/2018 and 06/30/2019

Characteristic	Percentage in each category		
	Center (N=16)	Region (N=127)	U.S. (N=473)
Blood Type (%)			
O	31.2	47.2	49.5
A	56.2	37.8	37.2
B	12.5	13.4	11.4
AB	0.0	1.6	1.9
Previous Transplant (%)			
Yes	0.0	0.8	1.1
No	100.0	99.2	98.9
Body Mass Index (%)			
0-20	12.5	23.6	22.4
21-25	31.2	22.8	28.5
26-30	50.0	29.9	29.4
31-35	6.2	12.6	12.5
36-40	0.0	6.3	4.9
41+	0.0	2.4	1.3
Unknown	0.0	2.4	1.1
Primary Disease (%)			
Acute Hepatic Necrosis	0.0	1.6	2.1
Non-Cholestatic Cirrhosis	43.8	55.9	46.9
Cholestatic Liver Disease/Cirrhosis	25.0	11.8	21.6
Biliary Atresia	0.0	9.4	9.9
Metabolic Diseases	0.0	5.5	4.0
Malignant Neoplasms	31.2	9.4	12.9
Other	0.0	6.3	2.5
Missing	0.0	0.0	0.0
Medical Urgency Statust/MELD/PELD at Transplant (%)*			
Status 1A	0.0	0.8	0.4
Status 1B	0.0	4.7	1.7
MELD 6-10	18.8	11.8	19.2
MELD 11-14	43.8	17.3	22.2
MELD 15-20	18.8	17.3	26.4
MELD 21-30	18.8	33.1	15.4
MELD 31-40	0.0	3.1	1.3
PELD less than or equal to 10	0.0	3.9	4.4
PELD 11-14	0.0	0.0	1.5
PELD 15-20	0.0	3.1	2.7
PELD 21-30	0.0	2.4	1.5
PELD 31 or greater	0.0	0.8	1.3
Temporarily Inactive	0.0	1.6	1.9
Recipient Medical Condition at Transplant (%)			
Not Hospitalized	87.5	91.3	86.0
Hospitalized	12.5	5.5	10.4
ICU	0.0	2.4	3.2
Unknown	0.0	0.8	0.4

* MELD/PELD score based on laboratory measures at the time of transplant is shown unless recipient is Status 1 or Temporarily Inactive. MELD/PELD scores based on exception rules are not used. Status 1 separated into 1A and 1B in August 2005



C. Transplant Information

Table C3D. Deceased donor characteristics

Transplants performed between 07/01/2018 and 06/30/2019

Donor Characteristic	Percentage in each category		
	Center (N=124)	Region (N=866)	U.S. (N=8,093)
Cause of Death (%)			
Deceased: Stroke	28.2	23.4	27.5
Deceased: MVA	5.6	11.2	13.2
Deceased: Other	66.1	65.4	59.3
Ethnicity/Race (%)*			
White	72.6	66.2	63.2
African-American	12.9	20.4	18.2
Hispanic/Latino	13.7	10.9	14.8
Asian	0.8	2.2	2.6
Other	0.0	0.3	1.2
Not Reported	0.0	0.0	0.0
Age (%)			
<2 years	0.0	2.3	1.4
2-11 years	1.6	2.7	2.5
12-17	4.8	4.3	4.6
18-34	27.4	31.1	32.1
35-49 years	33.1	28.8	27.5
50-64 years	24.2	22.9	24.1
65-69 years	4.0	3.8	4.0
70+ years	4.8	4.3	3.7
Gender (%)			
Male	54.8	59.8	59.8
Female	45.2	40.2	40.2
Blood Type (%)			
O	48.4	47.9	48.4
A	33.9	35.7	36.2
B	14.5	13.6	12.4
AB	3.2	2.8	3.0
Unknown	0.0	0.0	0.0

* Race and ethnicity are reported together as a single data element, reflecting their data collection (either race or ethnicity is required, but not both). Patients formerly coded as white and Hispanic are coded as Hispanic. Race and ethnicity sum to 100%.



C. Transplant Information

Table C3L. Living donor characteristics**Transplants performed between 07/01/2018 and 06/30/2019**

Donor Characteristic	Percentage in each category		
	Center (N=16)	Region (N=127)	U.S. (N=473)
Ethnicity/Race (%)*			
White	87.5	89.8	78.6
African-American	12.5	3.9	4.0
Hispanic/Latino	0.0	2.4	10.6
Asian	0.0	3.9	3.6
Other	0.0	0.0	3.2
Not Reported	0.0	0.0	0.0
Age (%)			
0-11 years	0.0	0.0	0.2
12-17	0.0	0.0	0.2
18-34	50.0	46.5	44.2
35-49 years	50.0	45.7	40.4
50-64 years	0.0	7.9	14.6
65-69 years	0.0	0.0	0.2
70+ years	0.0	0.0	0.2
Gender (%)			
Male	43.8	43.3	46.9
Female	56.2	56.7	53.1
Blood Type (%)			
O	56.2	63.0	66.8
A	31.2	26.8	25.4
B	12.5	10.2	7.8
AB	0.0	0.0	0.0
Unknown	0.0	0.0	0.0

* Race and ethnicity are reported together as a single data element, reflecting their data collection (either race or ethnicity is required, but not both). Patients formerly coded as white and Hispanic are coded as Hispanic. Race and ethnicity sum to 100%.



C. Transplant Information

Table C4D. Deceased donor transplant characteristics
Transplants performed between 07/01/2018 and 06/30/2019

Transplant Characteristic	Percentage in each category		
	Center (N=124)	Region (N=866)	U.S. (N=8,093)
Cold Ischemic Time (Hours): Local (%)			
Deceased: 0-5 hr	41.0	50.6	65.2
Deceased: 6-10 hr	56.2	46.4	32.6
Deceased: 11-15 hr	2.9	1.6	1.2
Deceased: 16-20 hr	0.0	0.2	0.1
Deceased: 21+ hr	0.0	0.0	0.1
Not Reported	0.0	1.2	0.8
Cold Ischemic Time (Hours): Shared (%)			
Deceased: 0-5 hr	10.5	46.8	43.2
Deceased: 6-10 hr	89.5	48.2	53.2
Deceased: 11-15 hr	0.0	2.3	2.9
Deceased: 16-20 hr	0.0	0.0	0.0
Deceased: 21+ hr	0.0	0.0	0.1
Not Reported	0.0	2.7	0.6
Procedure Type (%)			
Liver alone	92.7	91.2	90.2
Liver and another organ	7.3	8.8	9.8
Sharing (%)			
Local	84.7	65.2	62.7
Shared	15.3	34.8	37.3
Median Time in Hospital After Transplant*	9.0 Days	12.0 Days	10.0 Days

* Multiple organ transplants are excluded from this statistic.



C. Transplant Information

Table C4L. Living donor transplant characteristics
Transplants performed between 07/01/2018 and 06/30/2019

Transplant Characteristic	Percentage in each category		
	Center (N=16)	Region (N=127)	U.S. (N=473)
Relation with Donor (%)			
Related	93.8	48.8	49.9
Unrelated	6.2	51.2	50.1
Not Reported	0.0	0.0	0.0
Procedure Type (%)			
Liver alone	100.0	100.0	99.8
Liver and another organ	0.0	0.0	0.2
Median Time in Hospital After Transplant*	10.0 Days	10.0 Days	11.0 Days

* Multiple organ transplants are excluded from this statistic.



C. Transplant Information

Table C5. Adult (18+) 1-month survival with a functioning graft
Single organ transplants performed between 07/01/2016 and 12/31/2018
Deaths and retransplants are considered graft failures

	PAUP	U.S.
Number of transplants evaluated	303	16,923
Estimated probability of surviving with a functioning graft at 1 month (unadjusted for patient and donor characteristics)	97.36%	96.31%
Expected probability of surviving with a functioning graft at 1 month (adjusted for patient and donor characteristics)	96.69%	--
Number of observed graft failures (including deaths) during the first month after transplant	8	624
Number of expected graft failures (including deaths) during the first month after transplant	10.18	--
Estimated hazard ratio*	0.82	--
95% credible interval for the hazard ratio**	[0.39, 1.40]	--

* The hazard ratio provides an estimate of how Hospital of the University of Pennsylvania (PAUP)'s results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher risk), and a ratio below 1 indicates lower than expected graft failure rates (e.g., a hazard ratio of 0.75 would indicate 25% lower risk). If PAUP's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.39, 1.40], indicates the location of PAUP's true hazard ratio with 95% probability. The best estimate is 18% lower risk of graft failure compared to an average program, but PAUP's performance could plausibly range from 61% reduced risk up to 40% increased risk.

Figure C1. Adult (18+) 1-month graft failure HR estimate

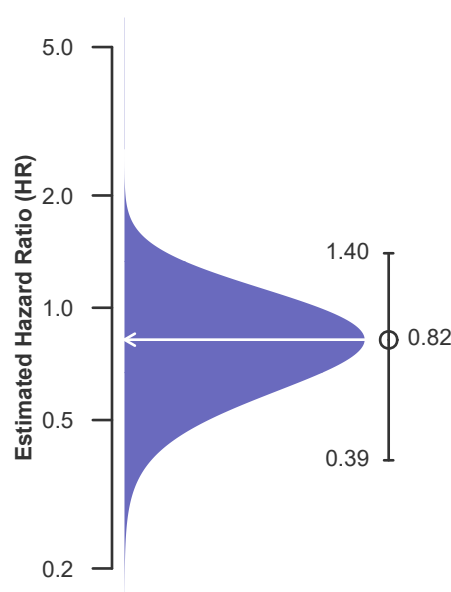
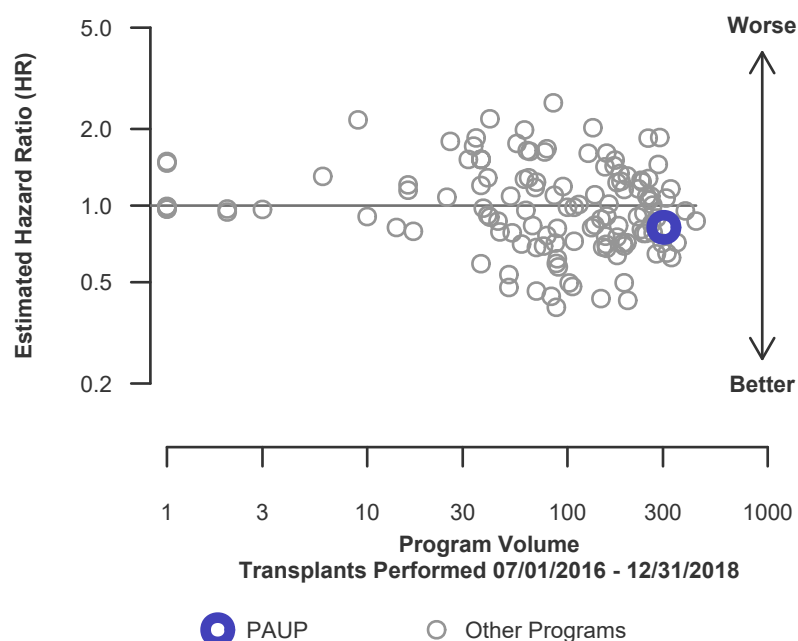


Figure C2. Adult (18+) 1-month graft failure HR program comparison





C. Transplant Information

Table C5D. Adult (18+) 1-month survival with a functioning deceased donor graft
Single organ transplants performed between 07/01/2016 and 12/31/2018
Deaths and retransplants are considered graft failures

	PAUP	U.S.
Number of transplants evaluated	277	16,151
Estimated probability of surviving with a functioning graft at 1 month (unadjusted for patient and donor characteristics)	97.11%	96.29%
Expected probability of surviving with a functioning graft at 1 month (adjusted for patient and donor characteristics)	96.68%	--
Number of observed graft failures (including deaths) during the first month after transplant	8	599
Number of expected graft failures (including deaths) during the first month after transplant	9.32	--
Estimated hazard ratio*	0.88	--
95% credible interval for the hazard ratio**	[0.42, 1.51]	--

* The hazard ratio provides an estimate of how Hospital of the University of Pennsylvania (PAUP)'s results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher risk), and a ratio below 1 indicates lower than expected graft failure rates (e.g., a hazard ratio of 0.75 would indicate 25% lower risk). If PAUP's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.42, 1.51], indicates the location of PAUP's true hazard ratio with 95% probability. The best estimate is 12% lower risk of graft failure compared to an average program, but PAUP's performance could plausibly range from 58% reduced risk up to 51% increased risk.

Figure C1D. Adult (18+) 1-month deceased donor graft failure HR estimate

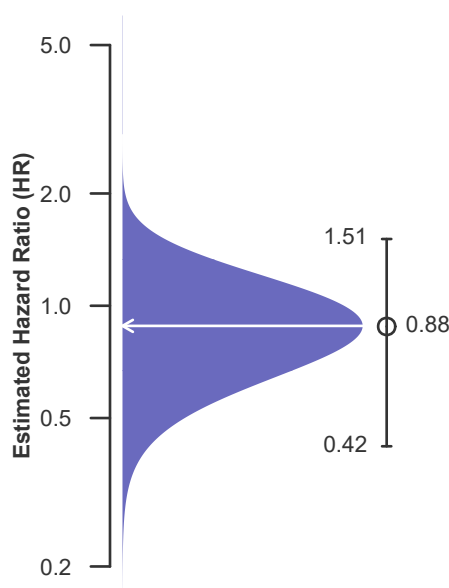
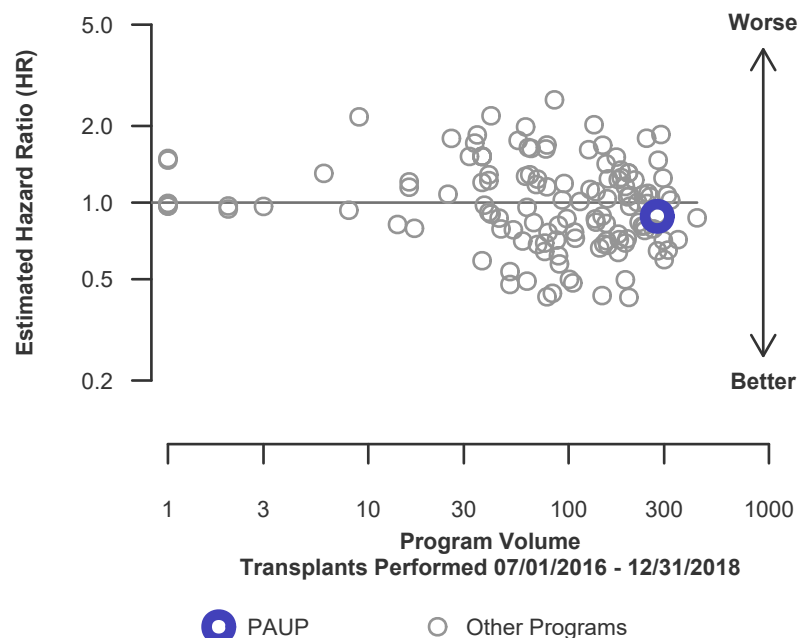


Figure C2D. Adult (18+) 1-month deceased donor graft failure HR program comparison





C. Transplant Information

Table C5L. Adult (18+) 1-month survival with a functioning living donor graft

Single organ transplants performed between 07/01/2016 and 12/31/2018

Deaths and retransplants are considered graft failures

	PAUP	U.S.
Number of transplants evaluated	26	772
Estimated probability of surviving with a functioning graft at 1 month (unadjusted for patient and donor characteristics)	100.00%	96.76%
Expected probability of surviving with a functioning graft at 1 month (adjusted for patient and donor characteristics)	96.77%	--
Number of observed graft failures (including deaths) during the first month after transplant	0	25
Number of expected graft failures (including deaths) during the first month after transplant	0.85	--
Estimated hazard ratio*	0.70	--
95% credible interval for the hazard ratio**	[0.08, 1.95]	--

* The hazard ratio provides an estimate of how Hospital of the University of Pennsylvania (PAUP)'s results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher risk), and a ratio below 1 indicates lower than expected graft failure rates (e.g., a hazard ratio of 0.75 would indicate 25% lower risk). If PAUP's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.08, 1.95], indicates the location of PAUP's true hazard ratio with 95% probability. The best estimate is 30% lower risk of graft failure compared to an average program, but PAUP's performance could plausibly range from 92% reduced risk up to 95% increased risk.

Figure C1L. Adult (18+) 1-month living donor graft failure HR estimate

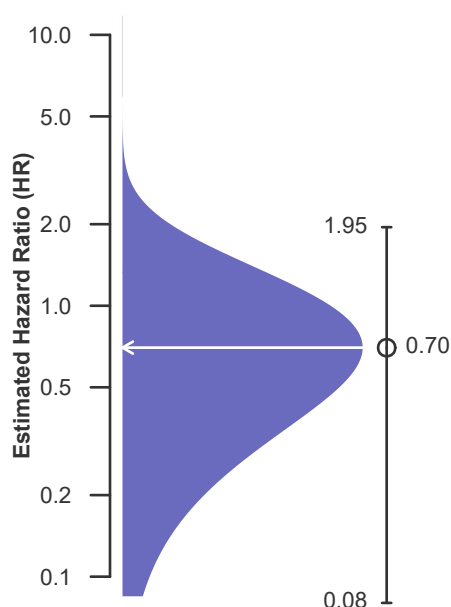
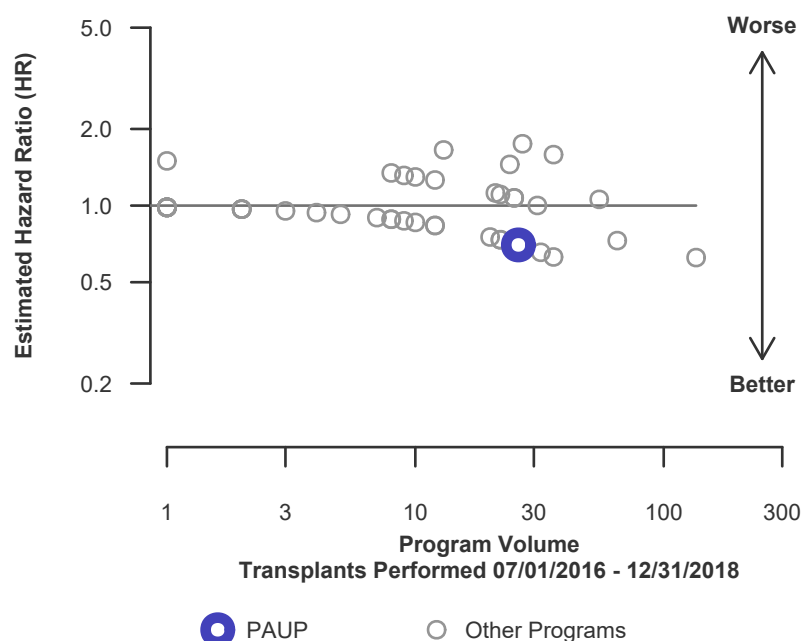


Figure C2L. Adult (18+) 1-month living donor graft failure HR program comparison





C. Transplant Information

Table C6. Adult (18+) 1-year survival with a functioning graft
Single organ transplants performed between 07/01/2016 and 12/31/2018
Deaths and retransplants are considered graft failures

	PAUP	U.S.
Number of transplants evaluated	303	16,923
Estimated probability of surviving with a functioning graft at 1 year (unadjusted for patient and donor characteristics)	91.44%	91.36%
Expected probability of surviving with a functioning graft at 1 year (adjusted for patient and donor characteristics)	91.98%	--
Number of observed graft failures (including deaths) during the first year after transplant	24	1,391
Number of expected graft failures (including deaths) during the first year after transplant	23.15	--
Estimated hazard ratio*	1.03	--
95% credible interval for the hazard ratio**	[0.68, 1.47]	--

* The hazard ratio provides an estimate of how Hospital of the University of Pennsylvania (PAUP)'s results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher risk), and a ratio below 1 indicates lower than expected graft failure rates (e.g., a hazard ratio of 0.75 would indicate 25% lower risk). If PAUP's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.68, 1.47], indicates the location of PAUP's true hazard ratio with 95% probability. The best estimate is 3% higher risk of graft failure compared to an average program, but PAUP's performance could plausibly range from 32% reduced risk up to 47% increased risk.

Figure C3. Adult (18+) 1-year graft failure HR estimate

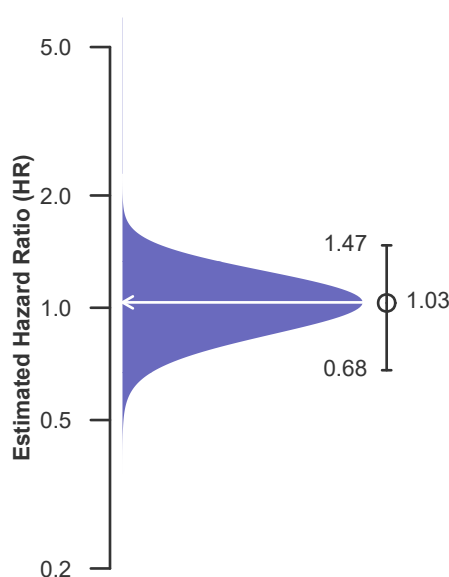
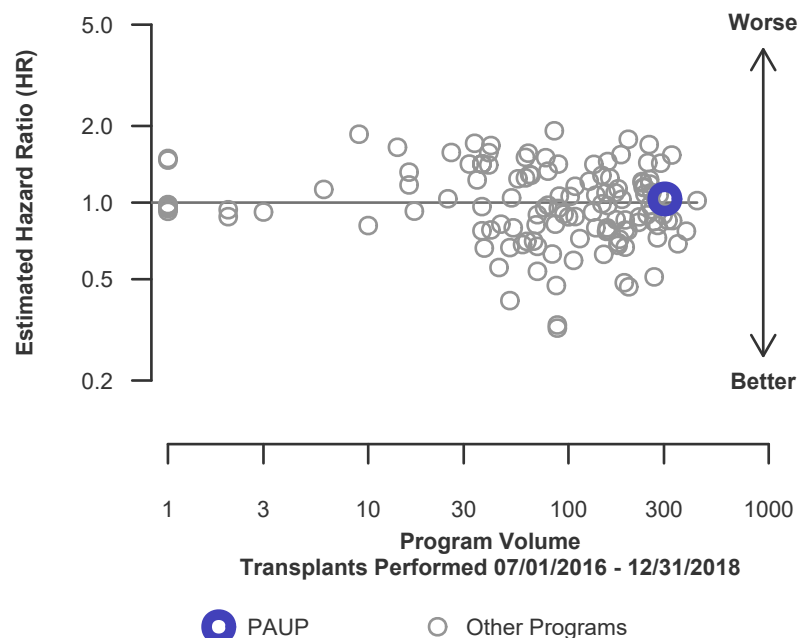


Figure C4. Adult (18+) 1-year graft failure HR program comparison





C. Transplant Information

Table C6D. Adult (18+) 1-year survival with a functioning deceased donor graft
Single organ transplants performed between 07/01/2016 and 12/31/2018
Deaths and retransplants are considered graft failures

	PAUP	U.S.
Number of transplants evaluated	277	16,151
Estimated probability of surviving with a functioning graft at 1 year (unadjusted for patient and donor characteristics)	91.12%	91.29%
Expected probability of surviving with a functioning graft at 1 year (adjusted for patient and donor characteristics)	91.91%	--
Number of observed graft failures (including deaths) during the first year after transplant	23	1,338
Number of expected graft failures (including deaths) during the first year after transplant	21.32	--
Estimated hazard ratio*	1.07	--
95% credible interval for the hazard ratio**	[0.69, 1.53]	--

* The hazard ratio provides an estimate of how Hospital of the University of Pennsylvania (PAUP)'s results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher risk), and a ratio below 1 indicates lower than expected graft failure rates (e.g., a hazard ratio of 0.75 would indicate 25% lower risk). If PAUP's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.69, 1.53], indicates the location of PAUP's true hazard ratio with 95% probability. The best estimate is 7% higher risk of graft failure compared to an average program, but PAUP's performance could plausibly range from 31% reduced risk up to 53% increased risk.

Figure C3D. Adult (18+) 1-year deceased donor graft failure HR estimate

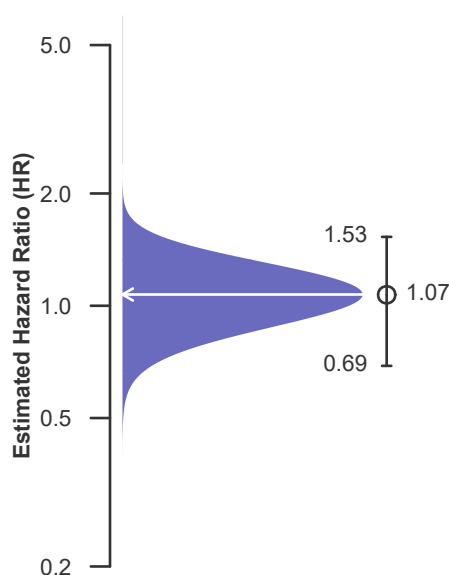
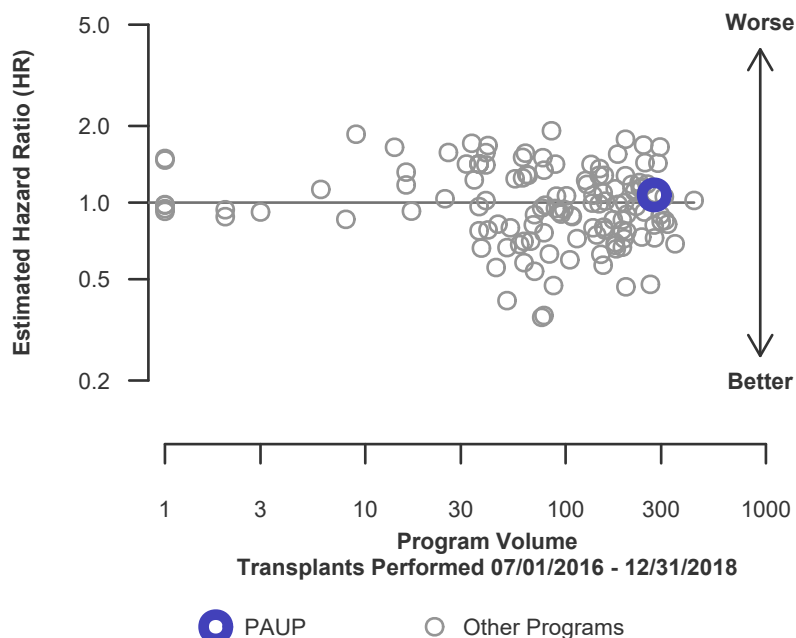


Figure C4D. Adult (18+) 1-year deceased donor graft failure HR program comparison





C. Transplant Information

Table C6L. Adult (18+) 1-year survival with a functioning living donor graft

Single organ transplants performed between 07/01/2016 and 12/31/2018

Deaths and retransplants are considered graft failures

	PAUP	U.S.
Number of transplants evaluated	26	772
Estimated probability of surviving with a functioning graft at 1 year (unadjusted for patient and donor characteristics)	94.74%	92.80%
Expected probability of surviving with a functioning graft at 1 year (adjusted for patient and donor characteristics)	92.80%	--
Number of observed graft failures (including deaths) during the first year after transplant	1	53
Number of expected graft failures (including deaths) during the first year after transplant	1.83	--
Estimated hazard ratio*	0.78	--
95% credible interval for the hazard ratio**	[0.16, 1.89]	--

* The hazard ratio provides an estimate of how Hospital of the University of Pennsylvania (PAUP)'s results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher risk), and a ratio below 1 indicates lower than expected graft failure rates (e.g., a hazard ratio of 0.75 would indicate 25% lower risk). If PAUP's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.16, 1.89], indicates the location of PAUP's true hazard ratio with 95% probability. The best estimate is 22% lower risk of graft failure compared to an average program, but PAUP's performance could plausibly range from 84% reduced risk up to 89% increased risk.

Figure C3L. Adult (18+) 1-year living donor graft failure HR estimate

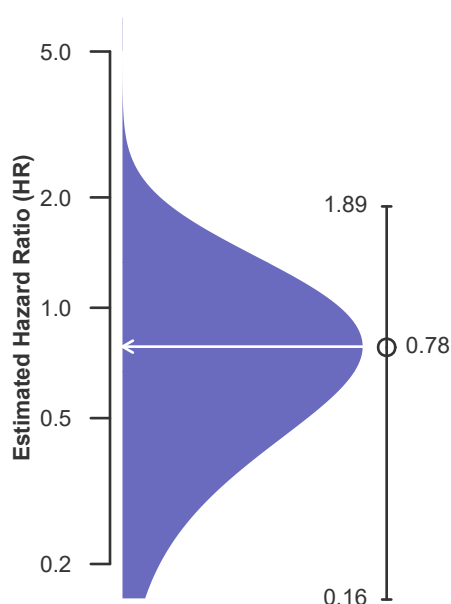
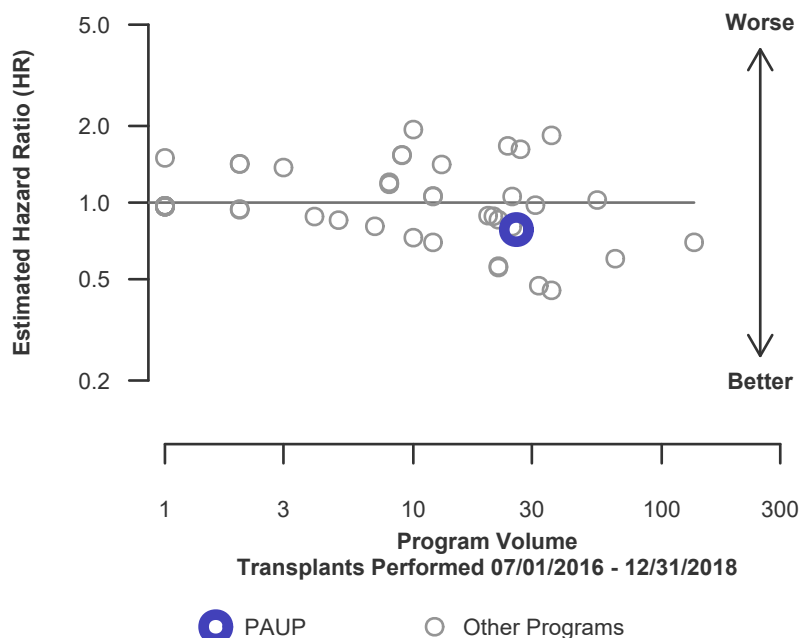


Figure C4L. Adult (18+) 1-year living donor graft failure HR program comparison





C. Transplant Information

Table C7. Adult (18+) 3-year survival with a functioning graft

Single organ transplants performed between 01/01/2014 and 06/30/2016

Deaths and retransplants are considered graft failures

	PAUP	U.S.
Number of transplants evaluated	301	14,626
Estimated probability of surviving with a functioning graft at 3 years (unadjusted for patient and donor characteristics)	88.37%	84.16%
Expected probability of surviving with a functioning graft at 3 years (adjusted for patient and donor characteristics)	84.29%	--
Number of observed graft failures (including deaths) during the first 3 years after transplant	35	2,317
Number of expected graft failures (including deaths) during the first 3 years after transplant	48.50	--
Estimated hazard ratio*	0.73	--
95% credible interval for the hazard ratio**	[0.52, 0.99]	--

* The hazard ratio provides an estimate of how Hospital of the University of Pennsylvania (PAUP)'s results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher risk), and a ratio below 1 indicates lower than expected graft failure rates (e.g., a hazard ratio of 0.75 would indicate 25% lower risk). If PAUP's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.52, 0.99], indicates the location of PAUP's true hazard ratio with 95% probability. The best estimate is 27% lower risk of graft failure compared to an average program, but PAUP's performance could plausibly range from 48% reduced risk up to 1% reduced risk.

Figure C5. Adult (18+) 3-year graft failure HR estimate

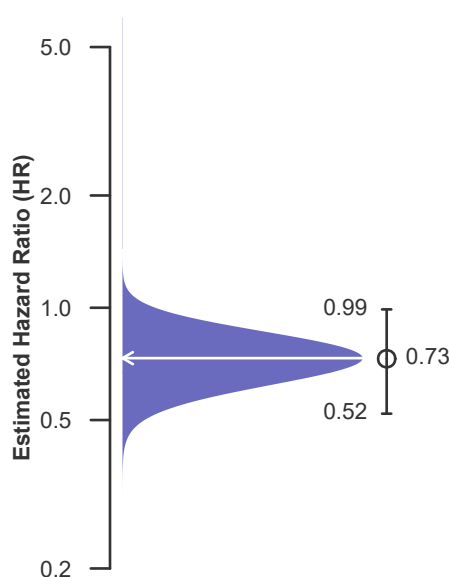
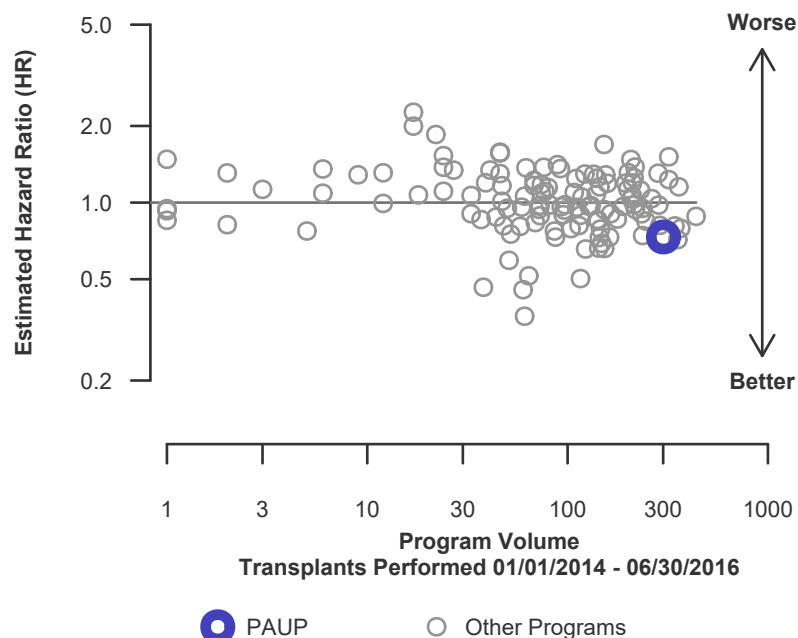


Figure C6. Adult (18+) 3-year graft failure HR program comparison





C. Transplant Information

Table C7D. Adult (18+) 3-year survival with a functioning deceased donor graft
Single organ transplants performed between 01/01/2014 and 06/30/2016
Deaths and retransplants are considered graft failures

	PAUP	U.S.
Number of transplants evaluated	274	13,978
Estimated probability of surviving with a functioning graft at 3 years (unadjusted for patient and donor characteristics)	87.59%	84.20%
Expected probability of surviving with a functioning graft at 3 years (adjusted for patient and donor characteristics)	84.39%	--
Number of observed graft failures (including deaths) during the first 3 years after transplant	34	2,209
Number of expected graft failures (including deaths) during the first 3 years after transplant	43.70	--
Estimated hazard ratio*	0.79	--
95% credible interval for the hazard ratio**	[0.55, 1.07]	--

* The hazard ratio provides an estimate of how Hospital of the University of Pennsylvania (PAUP)'s results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher risk), and a ratio below 1 indicates lower than expected graft failure rates (e.g., a hazard ratio of 0.75 would indicate 25% lower risk). If PAUP's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.55, 1.07], indicates the location of PAUP's true hazard ratio with 95% probability. The best estimate is 21% lower risk of graft failure compared to an average program, but PAUP's performance could plausibly range from 45% reduced risk up to 7% increased risk.

Figure C5D. Adult (18+) 3-year deceased donor graft failure HR estimate

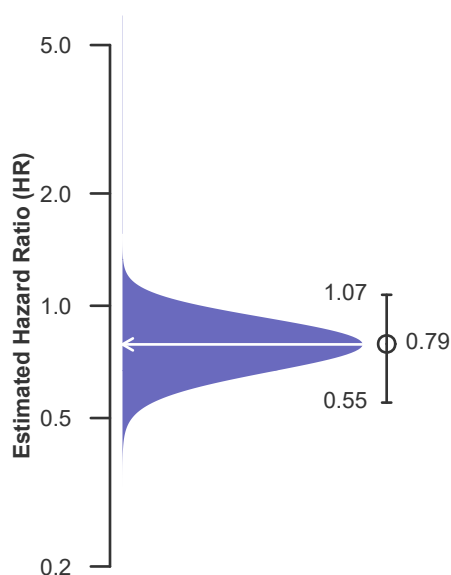
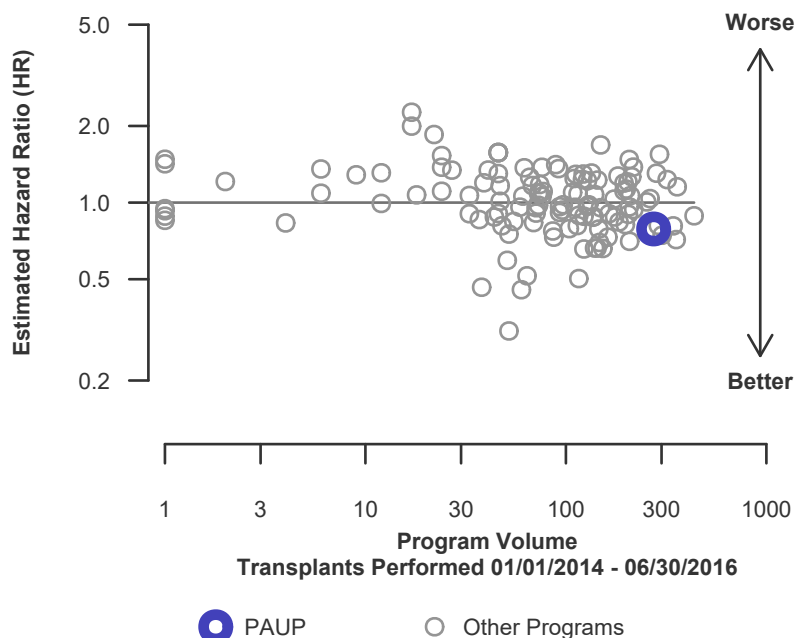


Figure C6D. Adult (18+) 3-year deceased donor graft failure HR program comparison





C. Transplant Information

Table C7L. Adult (18+) 3-year survival with a functioning living donor graft

Single organ transplants performed between 01/01/2014 and 06/30/2016

Deaths and retransplants are considered graft failures

	PAUP	U.S.
Number of transplants evaluated	27	648
Estimated probability of surviving with a functioning graft at 3 years (unadjusted for patient and donor characteristics)	96.30%	83.33%
Expected probability of surviving with a functioning graft at 3 years (adjusted for patient and donor characteristics)	83.35%	--
Number of observed graft failures (including deaths) during the first 3 years after transplant	1	108
Number of expected graft failures (including deaths) during the first 3 years after transplant	4.80	--
Estimated hazard ratio*	0.44	--
95% credible interval for the hazard ratio**	[0.09, 1.06]	--

* The hazard ratio provides an estimate of how Hospital of the University of Pennsylvania (PAUP)'s results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher risk), and a ratio below 1 indicates lower than expected graft failure rates (e.g., a hazard ratio of 0.75 would indicate 25% lower risk). If PAUP's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.09, 1.06], indicates the location of PAUP's true hazard ratio with 95% probability. The best estimate is 56% lower risk of graft failure compared to an average program, but PAUP's performance could plausibly range from 91% reduced risk up to 6% increased risk.

Figure C5L. Adult (18+) 3-year living donor graft failure HR estimate

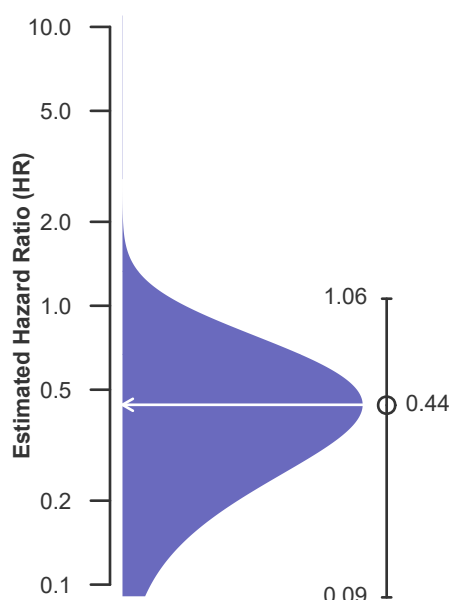
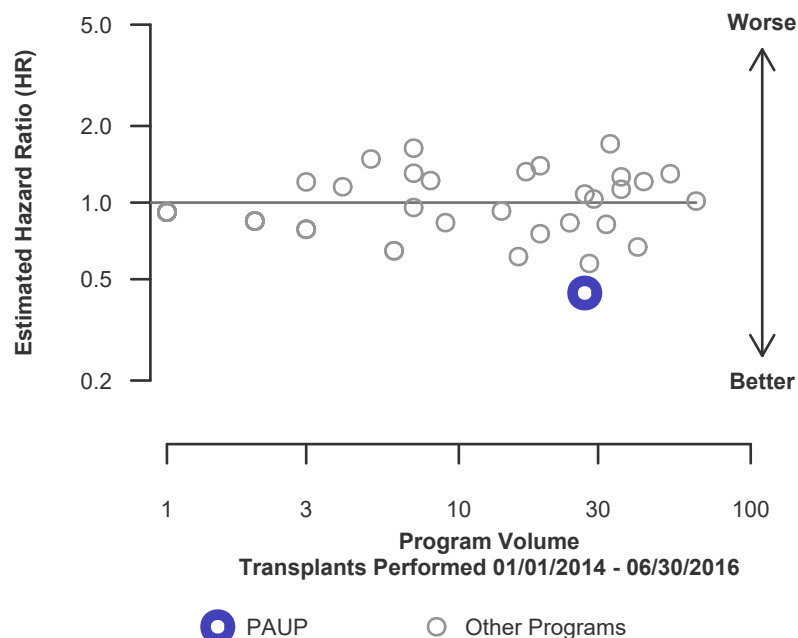


Figure C6L. Adult (18+) 3-year living donor graft failure HR program comparison





C. Transplant Information

Table C8. Pediatric (<18) 1-month survival with a functioning graft
Single organ transplants performed between 07/01/2016 and 12/31/2018
Deaths and retransplants are considered graft failures

This center did not perform any
transplants relevant to
this table during
07/01/2016-12/31/2018

**Figure C7. Pediatric (<18)
1-month graft failure HR estimate**

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018

**Figure C8. Pediatric (<18) 1-month graft failure HR program
comparison**

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018



C. Transplant Information

Table C8D. Pediatric (<18) 1-month survival with a functioning deceased donor graft

Single organ transplants performed between 07/01/2016 and 12/31/2018

Deaths and retransplants are considered graft failures

This center did not perform any
transplants relevant to
this table during
07/01/2016-12/31/2018

Figure C7D. Pediatric (<18) 1-month deceased donor graft failure HR estimate

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018

Figure C8D. Pediatric (<18) 1-month deceased donor graft failure HR program comparison

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018



C. Transplant Information

Table C8L. Pediatric (<18) 1-month survival with a functioning living donor graft

Single organ transplants performed between 07/01/2016 and 12/31/2018

Deaths and retransplants are considered graft failures

This center did not perform any
transplants relevant to
this table during
07/01/2016-12/31/2018

Figure C7L. Pediatric (<18)
1-month living donor graft failure
HR estimate

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018

Figure C8L. Pediatric (<18) 1-month living donor graft failure
HR program comparison

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018



C. Transplant Information

Table C9. Pediatric (<18) 1-year survival with a functioning graft
Single organ transplants performed between 07/01/2016 and 12/31/2018
Deaths and retransplants are considered graft failures

This center did not perform any
transplants relevant to
this table during
07/01/2016-12/31/2018

**Figure C9. Pediatric (<18) 1-year
graft failure HR estimate**

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018

**Figure C10. Pediatric (<18) 1-year graft failure HR program
comparison**

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018



C. Transplant Information

Table C9D. Pediatric (<18) 1-year survival with a functioning deceased donor graft
Single organ transplants performed between 07/01/2016 and 12/31/2018
Deaths and retransplants are considered graft failures

This center did not perform any
transplants relevant to
this table during
07/01/2016-12/31/2018

**Figure C9D. Pediatric (<18)
1-year deceased donor graft
failure HR estimate**

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018

**Figure C10D. Pediatric (<18) 1-year deceased donor graft
failure HR program comparison**

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018



C. Transplant Information

Table C9L. Pediatric (<18) 1-year survival with a functioning living donor graft

Single organ transplants performed between 07/01/2016 and 12/31/2018

Deaths and retransplants are considered graft failures

This center did not perform any
transplants relevant to
this table during
07/01/2016-12/31/2018

Figure C9L. Pediatric (<18) 1-year living donor graft failure HR estimate

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018

Figure C10L. Pediatric (<18) 1-year living donor graft failure HR program comparison

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018



C. Transplant Information

Table C10. Pediatric (<18) 3-year survival with a functioning graft
Single organ transplants performed between 01/01/2014 and 06/30/2016
Deaths and retransplants are considered graft failures

This center did not perform any
transplants relevant to
this table during
01/01/2014-06/30/2016

**Figure C11. Pediatric (<18) 3-year
graft failure HR estimate**

This center did not perform any
transplants relevant to
this figure during
01/01/2014-06/30/2016

**Figure C12. Pediatric (<18) 3-year graft failure HR program
comparison**

This center did not perform any
transplants relevant to
this figure during
01/01/2014-06/30/2016



C. Transplant Information

Table C10D. Pediatric (<18) 3-year survival with a functioning deceased donor graft

Single organ transplants performed between 01/01/2014 and 06/30/2016

Deaths and retransplants are considered graft failures

This center did not perform any
transplants relevant to
this table during
01/01/2014-06/30/2016

Figure C11D. Pediatric (<18) 3-year deceased donor graft failure HR estimate

This center did not perform any
transplants relevant to
this figure during
01/01/2014-06/30/2016

Figure C12D. Pediatric (<18) 3-year deceased donor graft failure HR program comparison

This center did not perform any
transplants relevant to
this figure during
01/01/2014-06/30/2016



C. Transplant Information

Table C10L. Pediatric (<18) 3-year survival with a functioning living donor graft

Single organ transplants performed between 01/01/2014 and 06/30/2016

Deaths and retransplants are considered graft failures

This center did not perform any
transplants relevant to
this table during
01/01/2014-06/30/2016

Figure C11L. Pediatric (<18) 3-year living donor graft failure HR estimate

This center did not perform any
transplants relevant to
this figure during
01/01/2014-06/30/2016

Figure C12L. Pediatric (<18) 3-year living donor graft failure HR program comparison

This center did not perform any
transplants relevant to
this figure during
01/01/2014-06/30/2016



C. Transplant Information

Table C11. Adult (18+) 1-month patient survival

Single organ transplants performed between 07/01/2016 and 12/31/2018

Retransplants excluded

	PAUP	U.S.
Number of transplants evaluated	290	16,277
Estimated probability of surviving at 1 month (unadjusted for patient and donor characteristics)	99.31%	97.59%
Expected probability of surviving at 1 month (adjusted for patient and donor characteristics)	97.83%	--
Number of observed deaths during the first month after transplant	2	393
Number of expected deaths during the first month after transplant	6.37	--
Estimated hazard ratio*	0.48	--
95% credible interval for the hazard ratio**	[0.13, 1.05]	--

* The hazard ratio provides an estimate of how Hospital of the University of Pennsylvania (PAUP)'s results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher risk), and a ratio below 1 indicates lower than expected patient death rates (e.g., a hazard ratio of 0.75 would indicate 25% lower risk). If PAUP's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.13, 1.05], indicates the location of PAUP's true hazard ratio with 95% probability. The best estimate is 52% lower risk of patient death compared to an average program, but PAUP's performance could plausibly range from 87% reduced risk up to 5% increased risk.

Figure C13. Adult (18+) 1-month patient death HR estimate

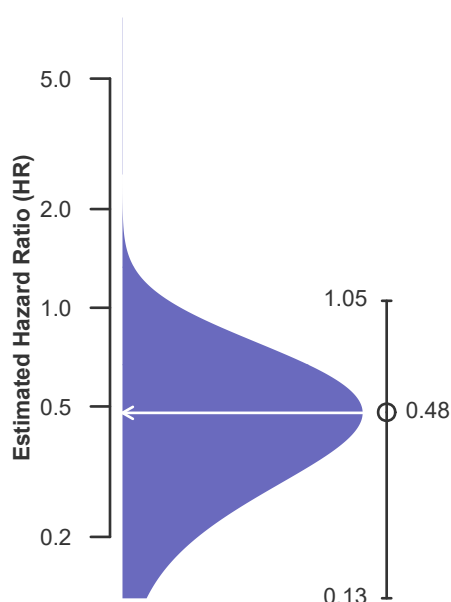
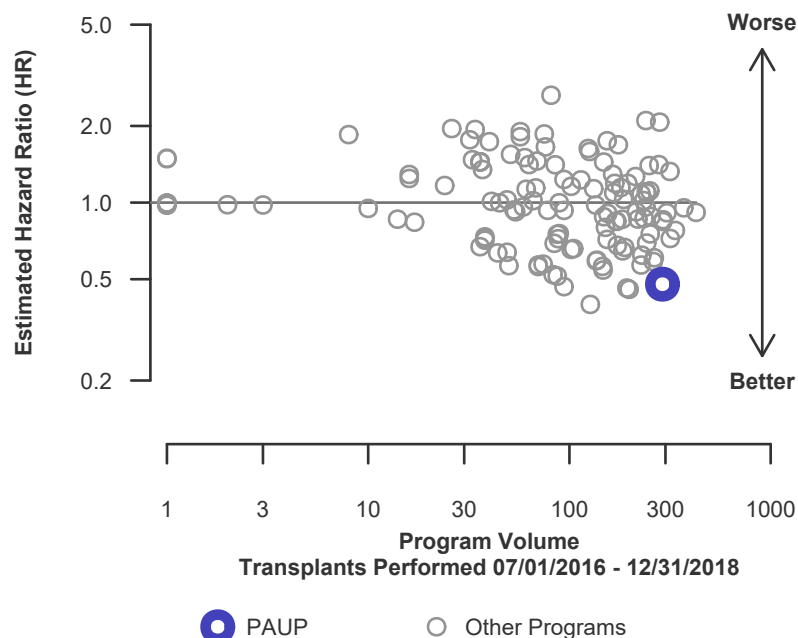


Figure C14. Adult (18+) 1-month patient death HR program comparison





C. Transplant Information

Table C11D. Adult (18+) 1-month patient survival (deceased donor graft recipients)

Single organ transplants performed between 07/01/2016 and 12/31/2018

Retransplants excluded

	PAUP	U.S.
Number of transplants evaluated	264	15,513
Estimated probability of surviving at 1 month (unadjusted for patient and donor characteristics)	99.24%	97.53%
Expected probability of surviving at 1 month (adjusted for patient and donor characteristics)	97.74%	--
Number of observed deaths during the first month after transplant	2	383
Number of expected deaths during the first month after transplant	6.03	--
Estimated hazard ratio*	0.50	--
95% credible interval for the hazard ratio**	[0.14, 1.09]	--

* The hazard ratio provides an estimate of how Hospital of the University of Pennsylvania (PAUP)'s results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher risk), and a ratio below 1 indicates lower than expected patient death rates (e.g., a hazard ratio of 0.75 would indicate 25% lower risk). If PAUP's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.14, 1.09], indicates the location of PAUP's true hazard ratio with 95% probability. The best estimate is 50% lower risk of patient death compared to an average program, but PAUP's performance could plausibly range from 86% reduced risk up to 9% increased risk.

Figure C13D. Adult (18+) 1-month patient death HR estimate (deceased donor grafts)

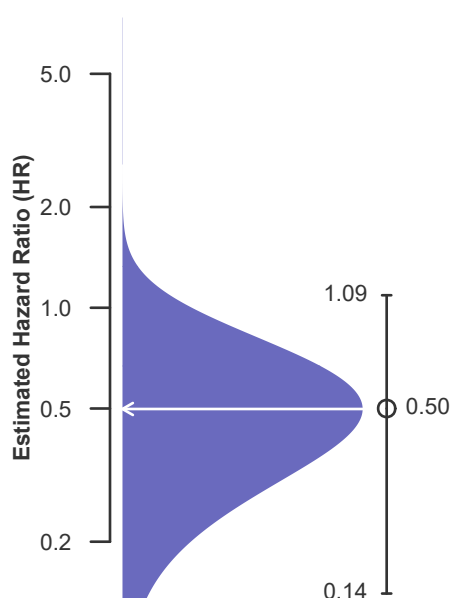
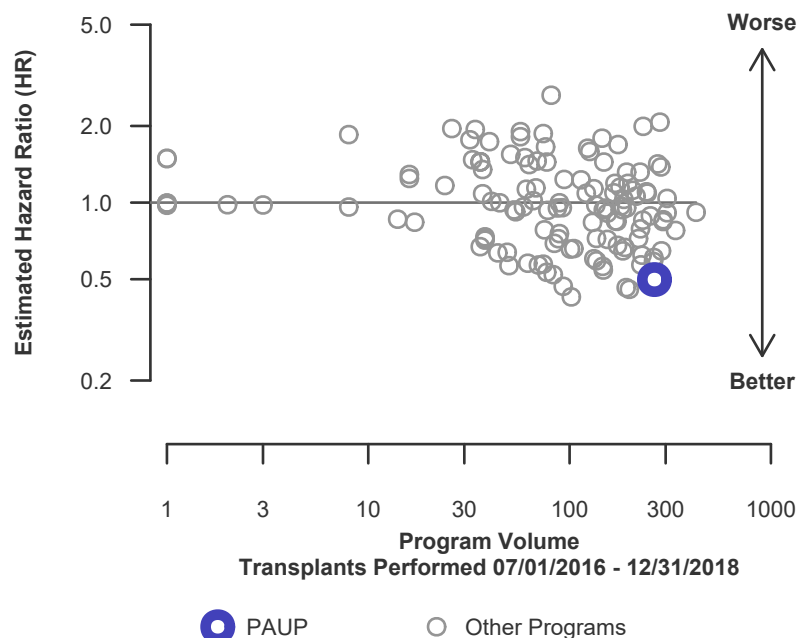


Figure C14D. Adult (18+) 1-month patient death HR program comparison (deceased donor grafts)





C. Transplant Information

Table C11L. Adult (18+) 1-month patient survival (living donor graft recipients)

Single organ transplants performed between 07/01/2016 and 12/31/2018

Retransplants excluded

	PAUP	U.S.
Number of transplants evaluated	26	764
Estimated probability of surviving at 1 month (unadjusted for patient and donor characteristics)	100.00%	98.69%
Expected probability of surviving at 1 month (adjusted for patient and donor characteristics)	98.69%	--
Number of observed deaths during the first month after transplant	0	10
Number of expected deaths during the first month after transplant	0.34	--
Estimated hazard ratio*	0.85	--
95% credible interval for the hazard ratio**	[0.10, 2.38]	--

* The hazard ratio provides an estimate of how Hospital of the University of Pennsylvania (PAUP)'s results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher risk), and a ratio below 1 indicates lower than expected patient death rates (e.g., a hazard ratio of 0.75 would indicate 25% lower risk). If PAUP's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.10, 2.38], indicates the location of PAUP's true hazard ratio with 95% probability. The best estimate is 15% lower risk of patient death compared to an average program, but PAUP's performance could plausibly range from 90% reduced risk up to 138% increased risk.

Figure C13L. Adult (18+) 1-month patient death HR estimate (living donor grafts)

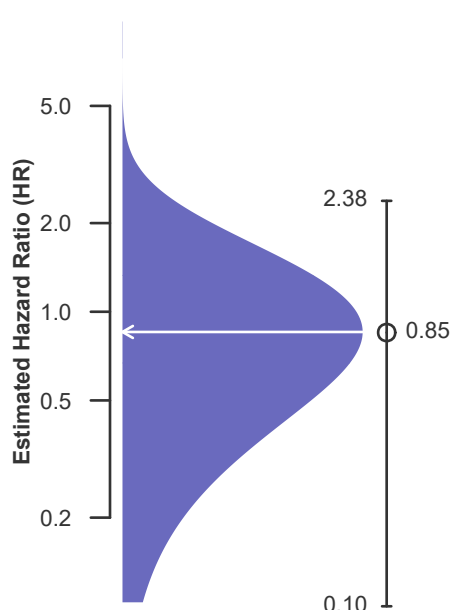
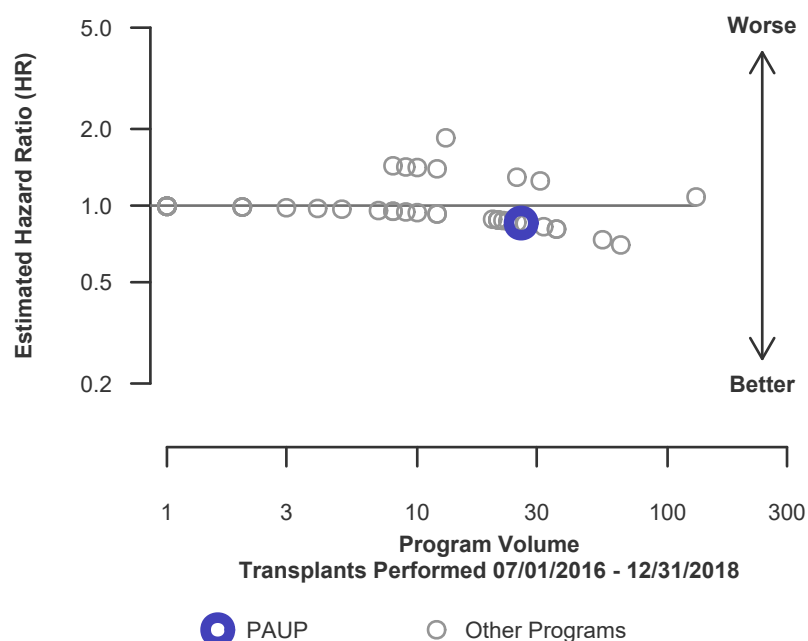


Figure C14L. Adult (18+) 1-month patient death HR program comparison (living donor grafts)





C. Transplant Information

Table C12. Adult (18+) 1-year patient survival

Single organ transplants performed between 07/01/2016 and 12/31/2018

Retransplants excluded

	PAUP	U.S.
Number of transplants evaluated	290	16,277
Estimated probability of surviving at 1 year (unadjusted for patient and donor characteristics)	93.92%	93.22%
Expected probability of surviving at 1 year (adjusted for patient and donor characteristics)	93.68%	--
Number of observed deaths during the first year after transplant	16	1,040
Number of expected deaths during the first year after transplant	17.38	--
Estimated hazard ratio*	0.93	--
95% credible interval for the hazard ratio**	[0.55, 1.40]	--

* The hazard ratio provides an estimate of how Hospital of the University of Pennsylvania (PAUP)'s results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher risk), and a ratio below 1 indicates lower than expected patient death rates (e.g., a hazard ratio of 0.75 would indicate 25% lower risk). If PAUP's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.55, 1.40], indicates the location of PAUP's true hazard ratio with 95% probability. The best estimate is 7% lower risk of patient death compared to an average program, but PAUP's performance could plausibly range from 45% reduced risk up to 40% increased risk.

Figure C15. Adult (18+) 1-year patient death HR estimate

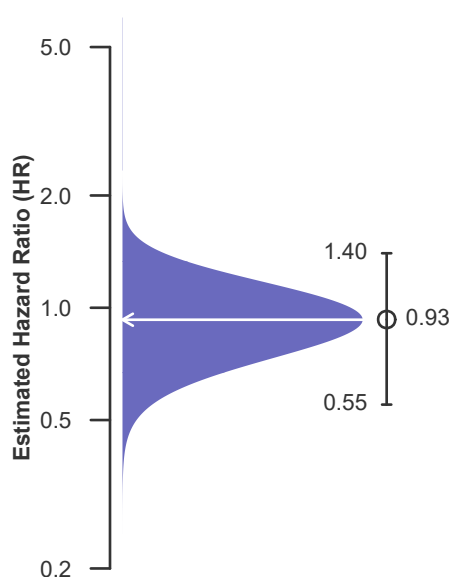
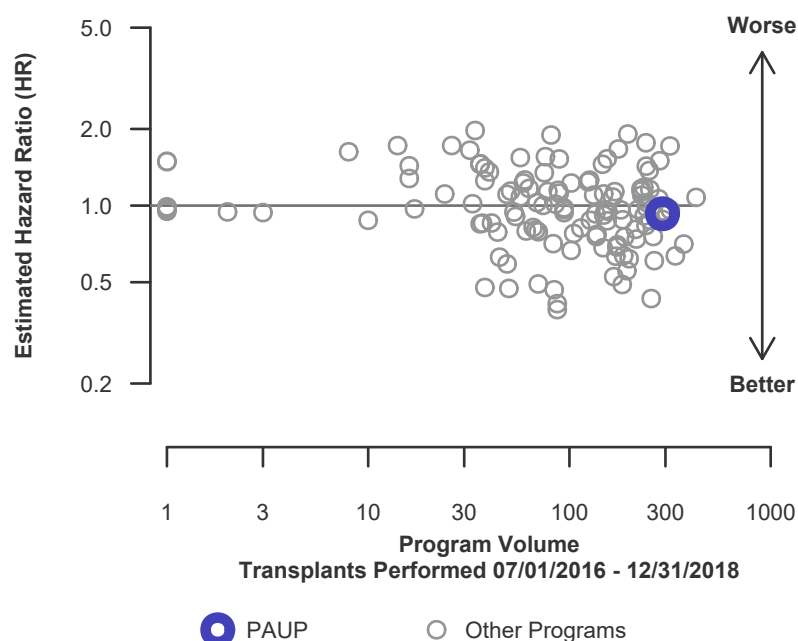


Figure C16. Adult (18+) 1-year patient death HR program comparison





C. Transplant Information

Table C12D. Adult (18+) 1-year patient survival (deceased donor graft recipients)

Single organ transplants performed between 07/01/2016 and 12/31/2018

Retransplants excluded

	PAUP	U.S.
Number of transplants evaluated	264	15,513
Estimated probability of surviving at 1 year (unadjusted for patient and donor characteristics)	93.34%	93.08%
Expected probability of surviving at 1 year (adjusted for patient and donor characteristics)	93.44%	--
Number of observed deaths during the first year after transplant	16	1,013
Number of expected deaths during the first year after transplant	16.45	--
Estimated hazard ratio*	0.98	--
95% credible interval for the hazard ratio**	[0.58, 1.47]	--

* The hazard ratio provides an estimate of how Hospital of the University of Pennsylvania (PAUP)'s results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher risk), and a ratio below 1 indicates lower than expected patient death rates (e.g., a hazard ratio of 0.75 would indicate 25% lower risk). If PAUP's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.58, 1.47], indicates the location of PAUP's true hazard ratio with 95% probability. The best estimate is 2% lower risk of patient death compared to an average program, but PAUP's performance could plausibly range from 42% reduced risk up to 47% increased risk.

Figure C15D. Adult (18+) 1-year patient death HR estimate (deceased donor grafts)

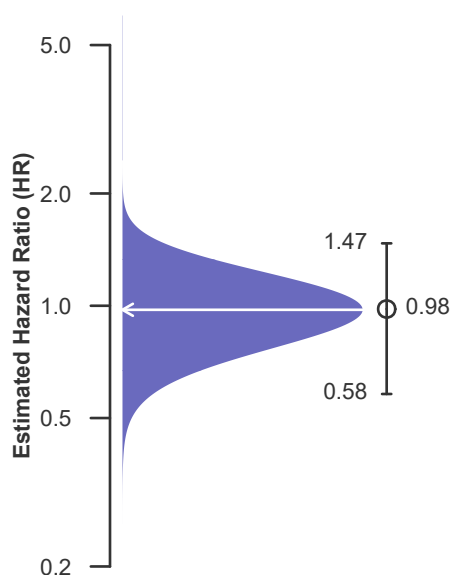
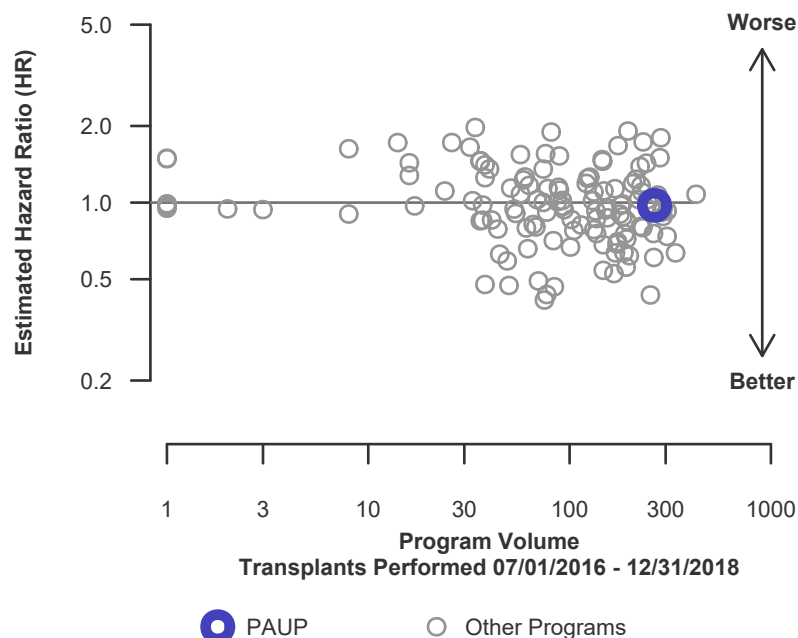


Figure C16D. Adult (18+) 1-year patient death HR program comparison (deceased donor grafts)





C. Transplant Information

Table C12L. Adult (18+) 1-year patient survival (living donor graft recipients)

Single organ transplants performed between 07/01/2016 and 12/31/2018

Retransplants excluded

	PAUP	U.S.
Number of transplants evaluated	26	764
Estimated probability of surviving at 1 year (unadjusted for patient and donor characteristics)	100.00%	96.17%
Expected probability of surviving at 1 year (adjusted for patient and donor characteristics)	96.17%	--
Number of observed deaths during the first year after transplant	0	27
Number of expected deaths during the first year after transplant	0.93	--
Estimated hazard ratio*	0.68	--
95% credible interval for the hazard ratio**	[0.08, 1.90]	--

* The hazard ratio provides an estimate of how Hospital of the University of Pennsylvania (PAUP)'s results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher risk), and a ratio below 1 indicates lower than expected patient death rates (e.g., a hazard ratio of 0.75 would indicate 25% lower risk). If PAUP's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.08, 1.90], indicates the location of PAUP's true hazard ratio with 95% probability. The best estimate is 32% lower risk of patient death compared to an average program, but PAUP's performance could plausibly range from 92% reduced risk up to 90% increased risk.

Figure C15L. Adult (18+) 1-year patient death HR estimate (living donor grafts)

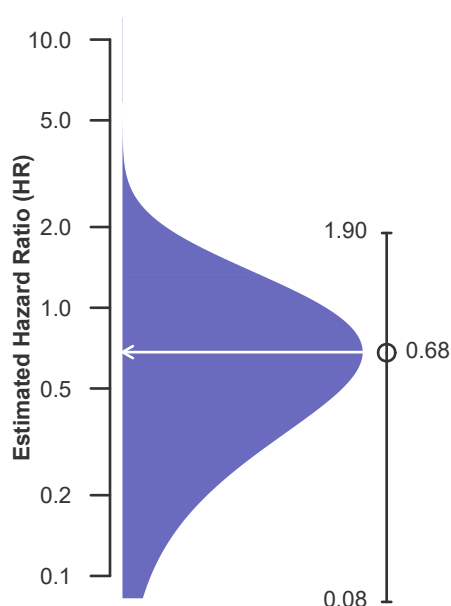


Figure C16L. Adult (18+) 1-year patient death HR program comparison (living donor grafts)





C. Transplant Information

Table C13. Adult (18+) 3-year patient survival

Single organ transplants performed between 01/01/2014 and 06/30/2016

Retransplants excluded

	PAUP	U.S.
Number of transplants evaluated	287	14,007
Estimated probability of surviving at 3 years (unadjusted for patient and donor characteristics)	90.59%	86.47%
Expected probability of surviving at 3 years (adjusted for patient and donor characteristics)	86.32%	--
Number of observed deaths during the first 3 years after transplant	27	1,895
Number of expected deaths during the first 3 years after transplant	40.41	--
Estimated hazard ratio*	0.68	--
95% credible interval for the hazard ratio**	[0.46, 0.95]	--

* The hazard ratio provides an estimate of how Hospital of the University of Pennsylvania (PAUP)'s results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher risk), and a ratio below 1 indicates lower than expected patient death rates (e.g., a hazard ratio of 0.75 would indicate 25% lower risk). If PAUP's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.46, 0.95], indicates the location of PAUP's true hazard ratio with 95% probability. The best estimate is 32% lower risk of patient death compared to an average program, but PAUP's performance could plausibly range from 54% reduced risk up to 5% reduced risk.

Figure C17. Adult (18+) 3-year patient death HR estimate

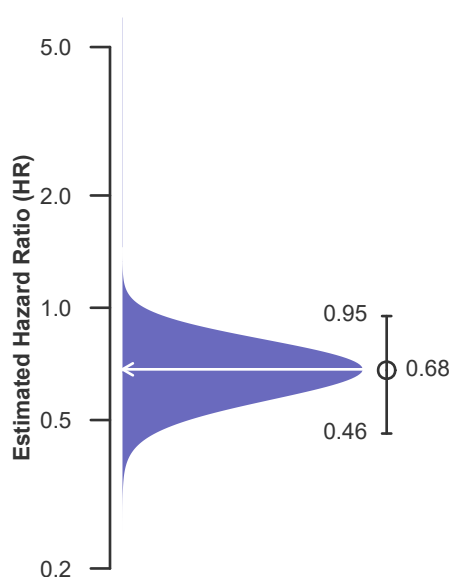
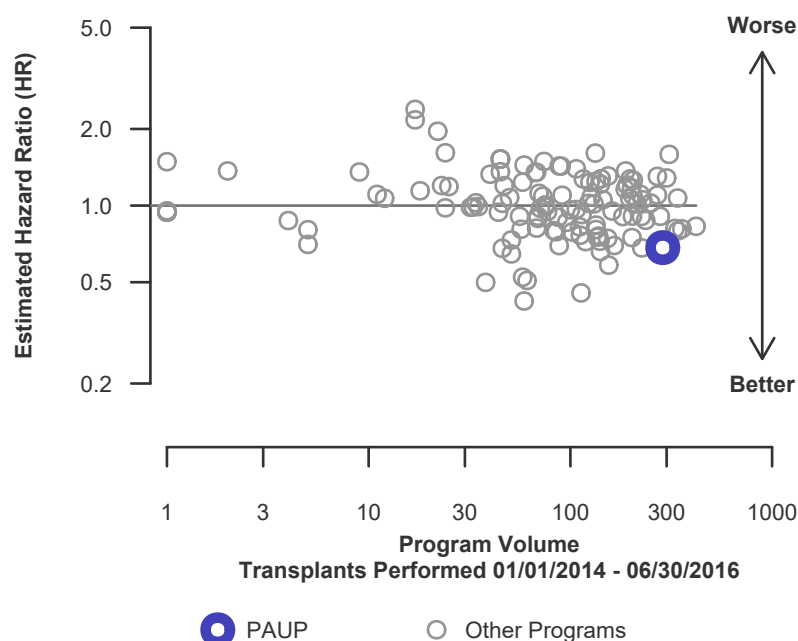


Figure C18. Adult (18+) 3-year patient death HR program comparison





C. Transplant Information

Table C13D. Adult (18+) 3-year patient survival (deceased donor graft recipients)

Single organ transplants performed between 01/01/2014 and 06/30/2016

Retransplants excluded

	PAUP	U.S.
Number of transplants evaluated	260	13,365
Estimated probability of surviving at 3 years (unadjusted for patient and donor characteristics)	90.00%	86.38%
Expected probability of surviving at 3 years (adjusted for patient and donor characteristics)	86.11%	--
Number of observed deaths during the first 3 years after transplant	26	1,820
Number of expected deaths during the first 3 years after transplant	37.16	--
Estimated hazard ratio*	0.72	--
95% credible interval for the hazard ratio**	[0.48, 1.00]	--

* The hazard ratio provides an estimate of how Hospital of the University of Pennsylvania (PAUP)'s results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher risk), and a ratio below 1 indicates lower than expected patient death rates (e.g., a hazard ratio of 0.75 would indicate 25% lower risk). If PAUP's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.48, 1.00], indicates the location of PAUP's true hazard ratio with 95% probability. The best estimate is 28% lower risk of patient death compared to an average program, but PAUP's performance could plausibly range from 52% reduced risk up to 0% increased risk.

Figure C17D. Adult (18+) 3-year patient death HR estimate (deceased donor grafts)

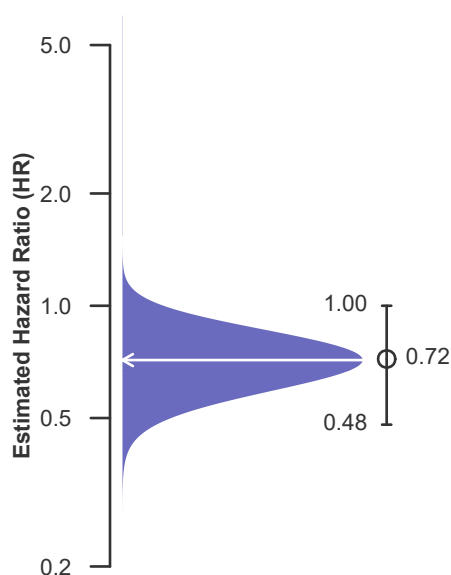
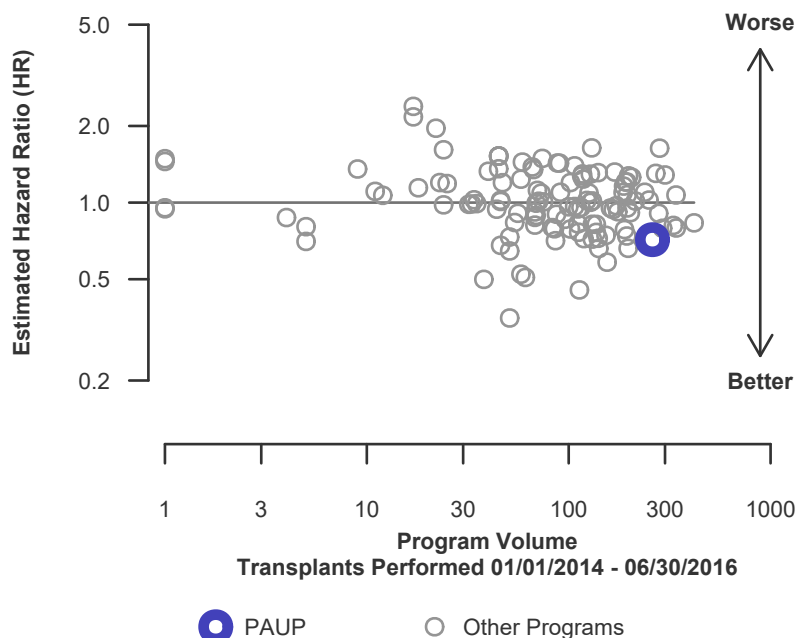


Figure C18D. Adult (18+) 3-year patient death HR program comparison (deceased donor grafts)





C. Transplant Information

Table C13L. Adult (18+) 3-year patient survival (living donor graft recipients)

Single organ transplants performed between 01/01/2014 and 06/30/2016

Retransplants excluded

	PAUP	U.S.
Number of transplants evaluated	27	642
Estimated probability of surviving at 3 years (unadjusted for patient and donor characteristics)	96.30%	88.32%
Expected probability of surviving at 3 years (adjusted for patient and donor characteristics)	88.33%	--
Number of observed deaths during the first 3 years after transplant	1	75
Number of expected deaths during the first 3 years after transplant	3.25	--
Estimated hazard ratio*	0.57	--
95% credible interval for the hazard ratio**	[0.12, 1.38]	--

* The hazard ratio provides an estimate of how Hospital of the University of Pennsylvania (PAUP)'s results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher risk), and a ratio below 1 indicates lower than expected patient death rates (e.g., a hazard ratio of 0.75 would indicate 25% lower risk). If PAUP's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.12, 1.38], indicates the location of PAUP's true hazard ratio with 95% probability. The best estimate is 43% lower risk of patient death compared to an average program, but PAUP's performance could plausibly range from 88% reduced risk up to 38% increased risk.

Figure C17L. Adult (18+) 3-year patient death HR estimate (living donor grafts)

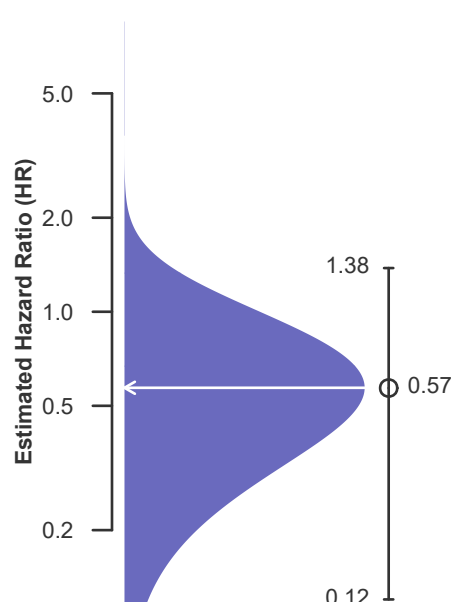
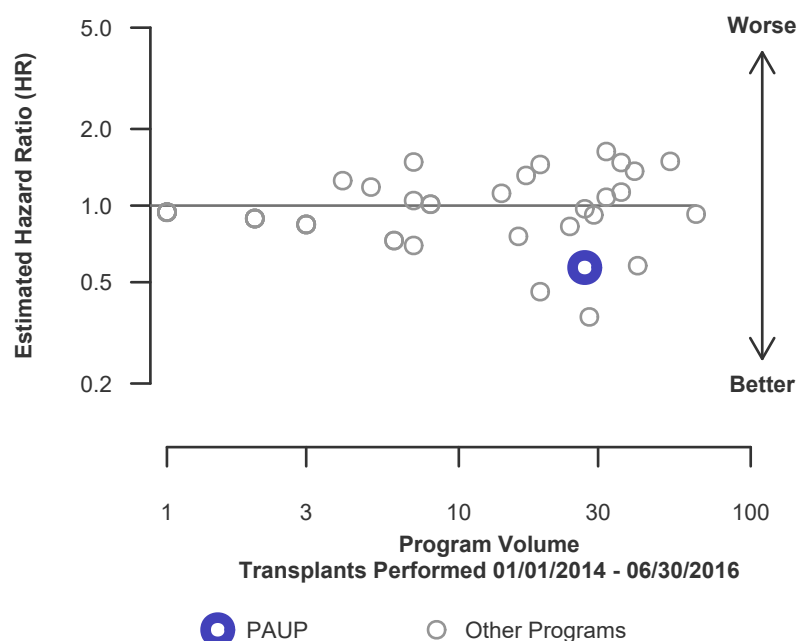


Figure C18L. Adult (18+) 3-year patient death HR program comparison (living donor grafts)





C. Transplant Information

Table C14. Pediatric (<18) 1-month patient survival

Single organ transplants performed between 07/01/2016 and 12/31/2018

Retransplants excluded

This center did not perform any
transplants relevant to
this table during
07/01/2016-12/31/2018

**Figure C19. Pediatric (<18)
1-month patient death HR
estimate**

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018

**Figure C20. Pediatric (<18) 1-month patient death HR program
comparison**

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018



C. Transplant Information

Table C14D. Pediatric (<18) 1-month patient survival (deceased donor graft recipients)

Single organ transplants performed between 07/01/2016 and 12/31/2018

Retransplants excluded

This center did not perform any
transplants relevant to
this table during
07/01/2016-12/31/2018

Figure C19D. Pediatric (<18) 1-month patient death HR estimate (deceased donor grafts)

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018

Figure C20D. Pediatric (<18) 1-month patient death HR program comparison (deceased donor grafts)

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018



C. Transplant Information

Table C14L. Pediatric (<18) 1-month patient survival (living donor graft recipients)

Single organ transplants performed between 07/01/2016 and 12/31/2018

Retransplants excluded

This center did not perform any
transplants relevant to
this table during
07/01/2016-12/31/2018

Figure C19L. Pediatric (<18) 1-month patient death HR estimate (living donor grafts)

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018

Figure C20L. Pediatric (<18) 1-month patient death HR program comparison (living donor grafts)

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018



C. Transplant Information

Table C15. Pediatric (<18) 1-year patient survival

Single organ transplants performed between 07/01/2016 and 12/31/2018

Retransplants excluded

This center did not perform any
transplants relevant to
this table during
07/01/2016-12/31/2018

Figure C21. Pediatric (<18) 1-year patient death HR estimate

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018

Figure C22. Pediatric (<18) 1-year patient death HR program comparison

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018



C. Transplant Information

Table C15D. Pediatric (<18) 1-year patient survival (deceased donor graft recipients)

Single organ transplants performed between 07/01/2016 and 12/31/2018

Retransplants excluded

This center did not perform any
transplants relevant to
this table during
07/01/2016-12/31/2018

Figure C21D. Pediatric (<18) 1-year patient death HR estimate (deceased donor grafts)

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018

Figure C22D. Pediatric (<18) 1-year patient death HR program comparison (deceased donor grafts)

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018



C. Transplant Information

Table C15L. Pediatric (<18) 1-year patient survival (living donor graft recipients)

Single organ transplants performed between 07/01/2016 and 12/31/2018

Retransplants excluded

This center did not perform any
transplants relevant to
this table during
07/01/2016-12/31/2018

Figure C21L. Pediatric (<18) 1-year patient death HR estimate (living donor grafts)

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018

Figure C22L. Pediatric (<18) 1-year patient death HR program comparison (living donor grafts)

This center did not perform any
transplants relevant to
this figure during
07/01/2016-12/31/2018



C. Transplant Information

Table C16. Pediatric (<18) 3-year patient survival

Single organ transplants performed between 01/01/2014 and 06/30/2016

Retransplants excluded

This center did not perform any
transplants relevant to
this table during
01/01/2014-06/30/2016

Figure C23. Pediatric (<18) 3-year patient death HR estimate

This center did not perform any
transplants relevant to
this figure during
01/01/2014-06/30/2016

Figure C24. Pediatric (<18) 3-year patient death HR program comparison

This center did not perform any
transplants relevant to
this figure during
01/01/2014-06/30/2016



C. Transplant Information

Table C16D. Pediatric (<18) 3-year patient survival (deceased donor graft recipients)

Single organ transplants performed between 01/01/2014 and 06/30/2016

Retransplants excluded

This center did not perform any
transplants relevant to
this table during
01/01/2014-06/30/2016

Figure C23D. Pediatric (<18) 3-year patient death HR estimate (deceased donor grafts)

This center did not perform any
transplants relevant to
this figure during
01/01/2014-06/30/2016

Figure C24D. Pediatric (<18) 3-year patient death HR program comparison (deceased donor grafts)

This center did not perform any
transplants relevant to
this figure during
01/01/2014-06/30/2016



C. Transplant Information

Table C16L. Pediatric (<18) 3-year patient survival (living donor graft recipients)

Single organ transplants performed between 01/01/2014 and 06/30/2016

Retransplants excluded

This center did not perform any
transplants relevant to
this table during
01/01/2014-06/30/2016

Figure C23L. Pediatric (<18) 3-year patient death HR estimate (living donor grafts)

This center did not perform any
transplants relevant to
this figure during
01/01/2014-06/30/2016

Figure C24L. Pediatric (<18) 3-year patient death HR program comparison (living donor grafts)

This center did not perform any
transplants relevant to
this figure during
01/01/2014-06/30/2016



C. Transplant Information

Table C17. Multi-organ transplant graft survival: 07/01/2016 - 12/31/2018

Adult (18+) Transplants

Transplant Type	First-Year Outcomes					
	Transplants Performed		Liver Graft Failures		Estimated Liver Graft Survival	
	PAUP-TX1	USA	PAUP-TX1	USA	PAUP-TX1	USA
Kidney-Liver	13	1,744	0	179	100.0%	89.2%
Liver-Heart	5	75	1	7	80.0%	89.5%
Liver-Lung	4	23	0	4	100.0%	82.6%

Pediatric (<18) Transplants

No pediatric (<18) multi-organ transplants were performed

Table C18. Multi-organ transplant patient survival: 07/01/2016 - 12/31/2018

Adult (18+) Transplants

Transplant Type	First-Year Outcomes					
	Transplants Performed		Patient Deaths		Estimated Patient Survival	
	PAUP-TX1	USA	PAUP-TX1	USA	PAUP-TX1	USA
Kidney-Liver	13	1,744	0	165	100.0%	90.0%
Liver-Heart	5	75	1	7	80.0%	89.5%
Liver-Lung	4	23	0	4	100.0%	82.6%

Pediatric (<18) Transplants

No pediatric (<18) multi-organ transplants were performed



D. Living Donor Information

Table D1. Living donor summary: 07/01/2016 - 06/30/2019

Living Donor Follow-Up	This Center			United States		
	07/2016- 06/2017	07/2017- 06/2018	07/2018- 12/2018	07/2016- 06/2017	07/2017- 06/2018	07/2018- 12/2018
Number of Living Donors	17	9	10	354	353	219
6-Month Follow-Up						
Donors due for follow-up	17	9	10	353	353	219
Timely clinical data	14 82.4%	9 100.0%	8 80.0%	300 85.0%	312 88.4%	190 86.8%
Timely lab data	12 70.6%	9 100.0%	8 80.0%	297 84.1%	305 86.4%	188 85.8%
12-Month Follow-Up						
Donors due for follow-up	17	9		353	353	
Timely clinical data	13 76.5%	4 44.4%		294 83.3%	291 82.4%	
Timely lab data	12 70.6%	4 44.4%		269 76.2%	284 80.5%	
24-Month Follow-Up						
Donors due for follow-up	17			352		
Timely clinical data	10 58.8%			255 72.4%		
Timely lab data	9 52.9%			219 62.2%		

Follow-up completion standards through 2 years post-donation were implemented in policy on February 1, 2013.