



User Guide

This report contains a wide range of useful information about the liver transplant program at Duke University Hospital (NCDU). 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 157.3 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 this table and figures is to describe risk of death once candidates are listed rather than while they are listed, but before they are transplanted. 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>.

Survival from listing is presented in Table B6 and Figures B7-B9. These data are presented in the same way as the waiting list mortality rate data in the previous section. The intent of this table and figures is to describe risk of death once candidates are listed rather than while they are listed, including after a transplant. As with transplant rates, mortality rates should be interpreted carefully taking into consideration the interval displayed in Figure B8. 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 B7 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 B8 and B9 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 B8 and B9 presents the percent of candidates who received a deceased donor transplant by each time point. Table B10 presents data on the time it took for different percentages of patients to be transplanted for candidates added to the list between 01/01/2014 and 06/30/2019. 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 12/31/2019 to calculate a particular percentile of transplant times.

Table B11 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 B10 shows the distribution of program offer acceptance rates as well as the offer acceptance rate for this program. Figures B11 - B15 similarly show offer acceptance rates for subsets



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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.

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

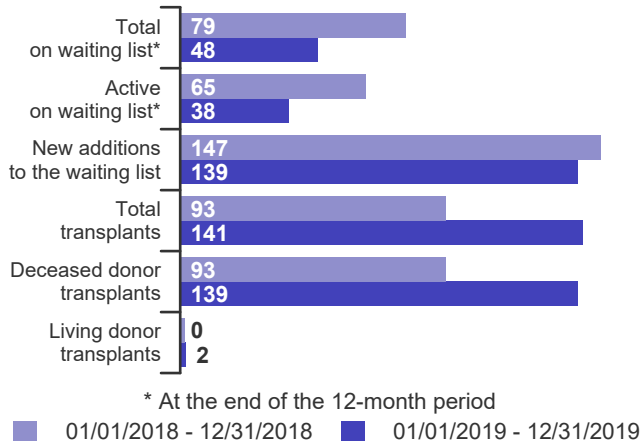


Table A1. Census of transplant recipients

Recipients	01/01/2018-12/31/2018	01/01/2019-12/31/2019
Transplanted at this center	93	141
Followed by this center*	680	729
...transplanted at this program	629	671
...transplanted elsewhere	51	58

* 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
01/01/2018 - 12/31/2019

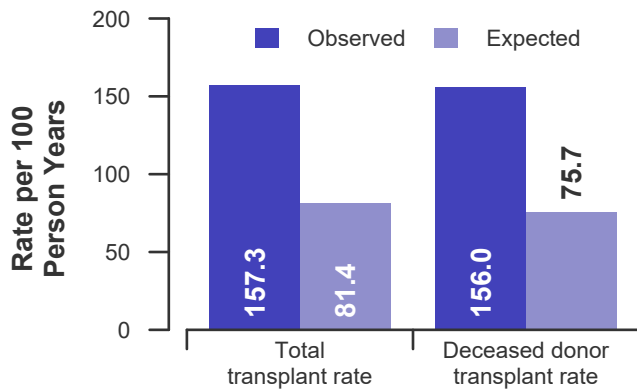


Figure A3. Waiting list mortality rates
01/01/2018 - 12/31/2019

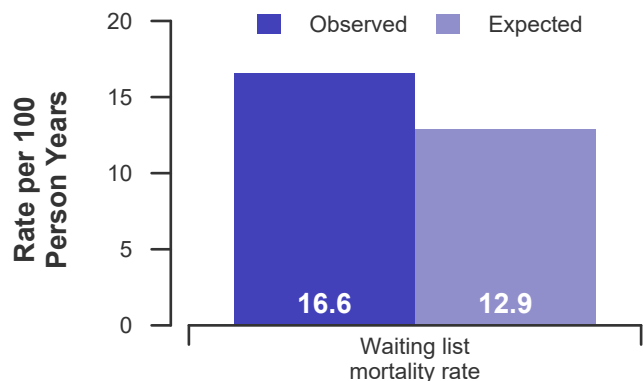


Figure A4. First-year adult graft and patient survival: 01/01/2017 - 06/30/2019

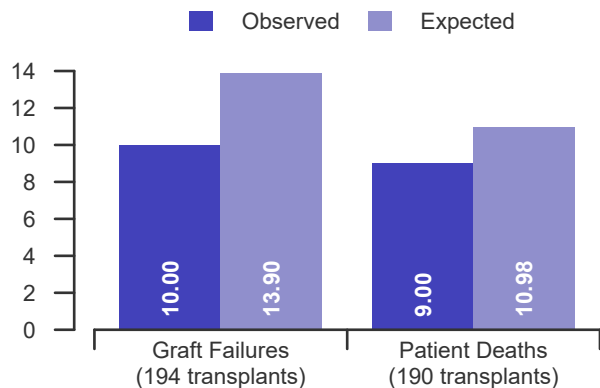
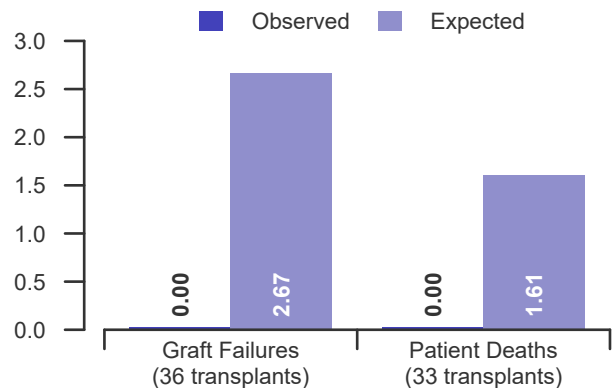


Figure A5. First-year pediatric graft and patient survival: 01/01/2017 - 06/30/2019





B. Waiting List Information

Table B1. Waiting list activity summary: 01/01/2018 - 12/31/2019

Waiting List Registrations	Counts for this center		Activity for 01/01/2019 to 12/31/2019 as percent of registrants on waiting list on 01/01/2019		
	01/01/2018-12/31/2018	01/01/2019-12/31/2019	This Center (%)	OPTN Region (%)	U.S. (%)
On waiting list at start	73	79	100.0	100.0	100.0
Additions					
New listings at this center	147	139	175.9	138.6	98.7
Removals					
Transferred to another center	1	0	0.0	1.0	1.2
Received living donor transplant*	0	2	2.5	1.7	3.8
Received deceased donor transplant*	93	139	175.9	101.2	61.4
Died	5	6	7.6	10.6	8.9
Transplanted at another center	11	5	6.3	3.6	2.8
Deteriorated	13	9	11.4	9.4	8.8
Recovered	11	7	8.9	10.8	7.2
Other reasons	7	2	2.5	6.8	9.1
On waiting list at end of period	79	48	60.8	93.5	95.5

* 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 01/01/2019 and 12/31/2019

Demographic Characteristic	New Waiting List Registrations 01/01/2019 to 12/31/2019 (%)			All Waiting List Registrations on 12/31/2019 (%)		
	This Center (N=139)	OPTN Region (N=1,160)	U.S. (N=13,463)	This Center (N=48)	OPTN Region (N=783)	U.S. (N=13,036)
All (%)	100.0	100.0	100.0	100.0	100.0	100.0
Ethnicity/Race (%)*						
White	82.7	82.9	69.0	79.2	84.2	67.1
African-American	10.1	10.9	7.6	12.5	8.7	7.4
Hispanic/Latino	3.6	3.5	17.3	6.2	3.7	18.3
Asian	2.2	1.3	4.4	2.1	1.5	5.5
Other	1.4	1.4	1.7	0.0	1.9	1.6
Unknown	0.0	0.0	0.0	0.0	0.0	0.0
Age (%)						
<2 years	5.0	1.8	2.4	2.1	0.6	1.2
2-11 years	2.2	1.5	1.6	4.2	0.6	1.2
12-17 years	2.9	1.5	1.1	6.2	1.7	1.1
18-34 years	4.3	5.0	6.2	2.1	4.6	6.1
35-49 years	15.8	17.1	17.7	4.2	16.2	18.3
50-64 years	48.2	50.3	48.7	47.9	52.7	52.6
65-69 years	18.0	18.4	17.2	27.1	19.9	15.9
70+ years	3.6	4.4	5.2	6.2	3.6	3.7
Gender (%)						
Male	56.8	63.3	61.7	56.2	65.4	60.4
Female	43.2	36.7	38.3	43.8	34.6	39.6

* 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%.



B. Waiting List Information

Table B3. Medical characteristics of waiting list candidates

Candidates registered on the waiting list between 01/01/2019 and 12/31/2019

Medical Characteristic	New Waiting List Registrations 01/01/2019 to 12/31/2019 (%)			All Waiting List Registrations on 12/31/2019 (%)		
	This Center (N=139)	OPTN Region (N=1,160)	U.S. (N=13,463)	This Center (N=48)	OPTN Region (N=783)	U.S. (N=13,036)
All (%)	100.0	100.0	100.0	100.0	100.0	100.0
Blood Type (%)						
O	45.3	47.8	47.0	52.1	48.4	49.2
A	39.6	38.1	37.5	39.6	41.8	38.5
B	11.5	11.1	11.9	4.2	7.7	10.2
AB	3.6	3.0	3.7	4.2	2.2	2.0
Unknown	0.0	0.0	0.0	0.0	0.0	0.0
Previous Transplant (%)						
Yes	2.9	3.5	4.7	6.2	2.4	3.3
No	97.1	96.5	95.3	93.8	97.6	96.7
Unknown	0.0	0.0	0.0	0.0	0.0	0.0
Primary Disease (%)						
Acute Hepatic Necrosis	0.7	3.1	4.3	2.1	0.6	1.7
Non-Cholestatic Cirrhosis	62.6	72.8	66.9	66.7	76.5	71.0
Cholestatic Liver Disease/Cirrhosis	10.8	6.8	7.1	8.3	7.2	8.0
Biliary Atresia	2.2	1.0	2.1	0.0	0.9	1.6
Metabolic Diseases	4.3	3.3	2.4	2.1	2.0	1.6
Malignant Neoplasms	10.8	9.2	11.8	8.3	8.8	10.5
Other	8.6	3.7	5.3	12.5	3.8	5.4
Missing	0.0	0.1	0.1	0.0	0.1	0.0
Medical Urgency Status/MELD/PELD at Listing (%)*						
Status 1A	1.4	2.2	2.9	0.0	0.0	0.3
Status 1B	0.7	0.3	0.3	0.0	0.0	0.0
Status 2A	0.0	0.0	0.0	0.0	0.0	0.0
Status 2B	0.0	0.0	0.0	0.0	0.1	0.1
Status 3	0.0	0.0	0.0	0.0	0.0	0.5
MELD 6-10	14.4	12.7	18.1	27.1	16.5	29.4
MELD 11-14	15.8	19.0	18.7	29.2	32.8	29.0
MELD 15-20	31.7	30.1	23.1	33.3	36.4	24.5
MELD 21-30	23.0	20.9	18.3	4.2	10.1	8.8
MELD 31-40	5.0	9.8	11.3	0.0	1.1	0.9
PELD less than or equal to 10	4.3	1.7	1.6	6.2	1.1	1.7
PELD 11-14	0.0	0.1	0.3	0.0	0.0	0.1
PELD 15-20	0.0	0.3	0.5	0.0	0.0	0.2
PELD 21-30	1.4	0.4	0.4	0.0	0.0	0.1
PELD 31 or greater	0.7	0.1	0.1	0.0	0.0	0.0
Temporarily Inactive	1.4	2.5	4.3	0.0	1.8	4.4

* 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: 01/01/2018 - 12/31/2019

Waiting List Registrations	This Center	OPO/DSA	Region	U.S.
All Candidates				
Count on waiting list at start*	73	142	878	14,161
Person Years**	148.8	253.0	1,682.0	27,294.5
Removals for Transplant	234	316	1,649	17,146
Adult (18+) Candidates				
Count on waiting list at start*	67	135	854	13,614
Person Years**	136.9	239.6	1,623.9	26,280.5
Removals for transplant	206	286	1,554	16,003
Pediatric (<18) Candidates				
Count on waiting list at start*	6	7	24	547
Person Years**	11.8	13.4	58.1	1,014.0
Removals for transplant	28	30	95	1,143

* 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 January 1 or from the date of first wait listing until death, transplant, removal from the waiting list or December 31.

Figure B1. Observed and expected transplant rates: 01/01/2018 - 12/31/2019

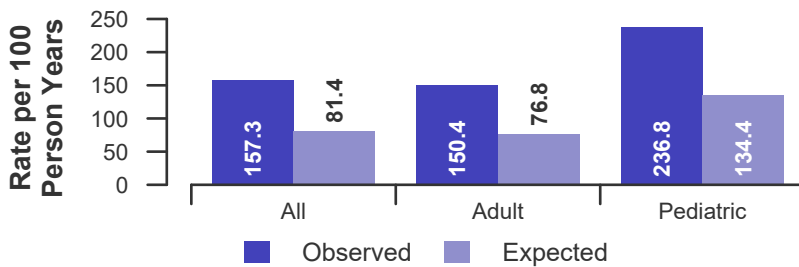


Figure B2. Transplant rate ratio estimate

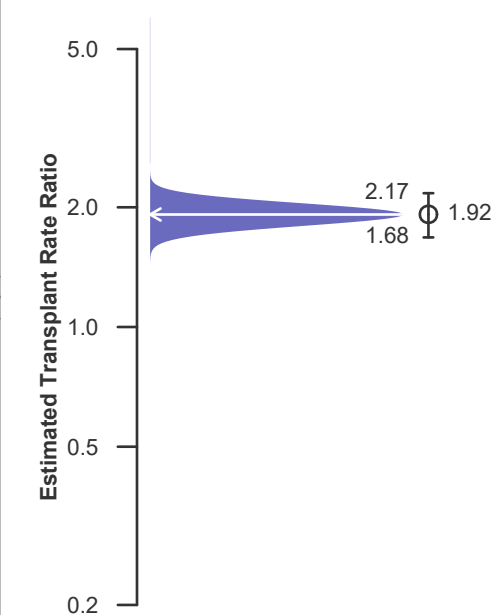
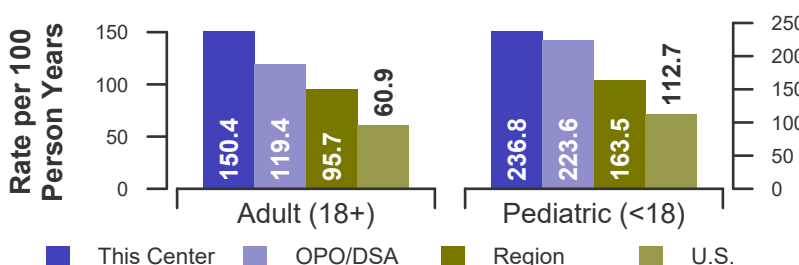


Figure B3. Observed adult (18+) and pediatric (<18) transplant rates: 01/01/2018 - 12/31/2019





B. Waiting List Information

Table B4D. Deceased donor transplant rates: 01/01/2018 - 12/31/2019

Waiting List Registrations	This Center	OPO/DSA	Region	U.S.
All Candidates				
Count on waiting list at start*	73	142	878	14,161
Person Years**	148.8	253.0	1,682.0	27,294.5
Removals for Transplant	232	314	1,627	16,222
Adult (18+) Candidates				
Count on waiting list at start*	67	135	854	13,614
Person Years**	136.9	239.6	1,623.9	26,280.5
Removals for transplant	205	285	1,533	15,223
Pediatric (<18) Candidates				
Count on waiting list at start*	6	7	24	547
Person Years**	11.8	13.4	58.1	1,014.0
Removals for transplant	27	29	94	999

* 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 January 1 or from the date of first wait listing until death, transplant, removal from the waiting list or December 31.

Figure B1D. Observed and expected deceased donor transplant rates: 01/01/2018 - 12/31/2019

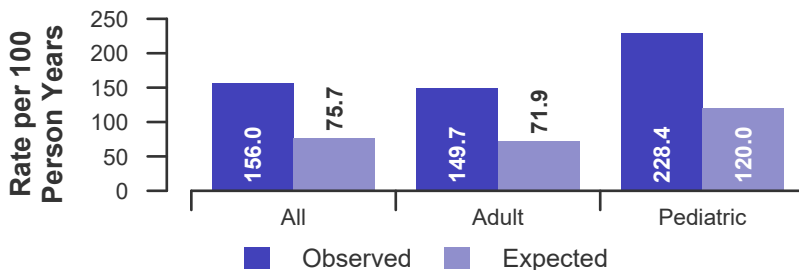


Figure B2D. Deceased donor transplant rate ratio estimate

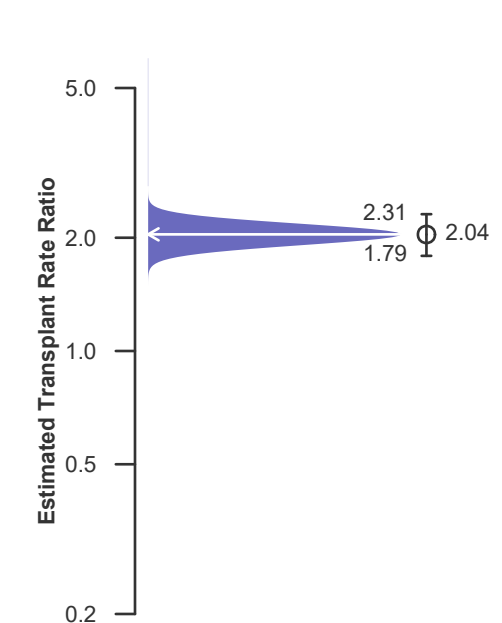
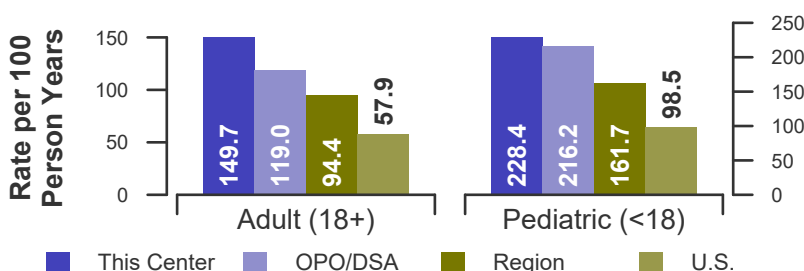


Figure B3D. Observed adult (18+) and pediatric (<18) deceased donor transplant rates: 01/01/2018 - 12/31/2019





B. Waiting List Information

Table B5. Waiting list mortality rates: 01/01/2018 - 12/31/2019

Waiting List Registrations	This Center	OPO/DSA	Region	U.S.
All Candidates				
Count on waiting list at start*	73	142	878	14,161
Person Years**	169.2	301.1	1,932.1	31,578.0
Number of deaths	28	58	281	3,724
Adult (18+) Candidates				
Count on waiting list at start*	67	135	854	13,614
Person Years**	156.6	286.8	1,868.1	30,466.5
Number of deaths	27	56	278	3,661
Pediatric (<18) Candidates				
Count on waiting list at start*	6	7	24	547
Person Years**	12.5	14.3	63.9	1,111.6
Number of deaths	1	2	3	63

* 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 January 1 or from the date of first wait listing until death, transplant, 60 days after recovery, transfer or December 31.

Figure B4. Observed and expected waiting list mortality rates: 01/01/2018 - 12/31/2019

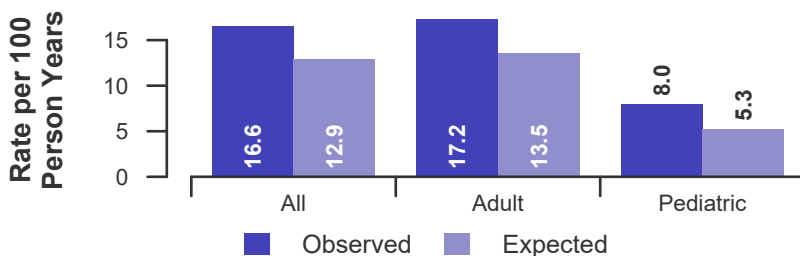


Figure B5. Waiting list mortality rate ratio estimate

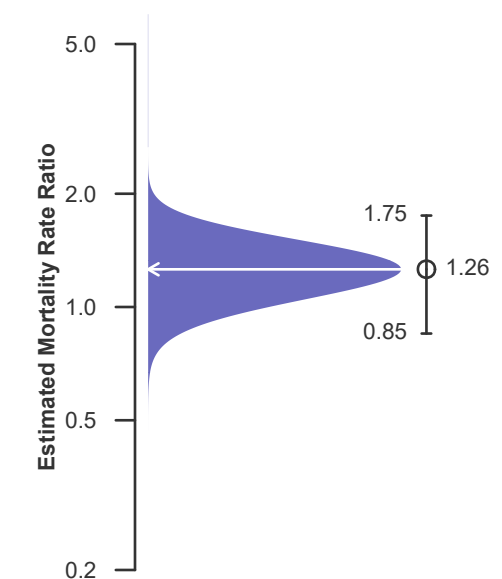
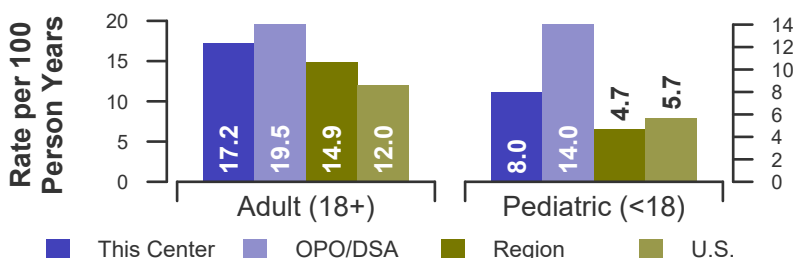


Figure B6. Observed adult (18+) and pediatric (<18) waiting list mortality rates: 01/01/2018 - 12/31/2019





B. Waiting List Information

Table B6. Rates of patient mortality after listing: 01/01/2018 - 12/31/2019

Waiting List Registrations	This Center	OPO/DSA	Region	U.S.
All Patients				
Count at risk during the evaluation period	738	1,089	6,276	72,006
Person-years*	1,011.8	1,479.1	8,385.9	96,169.6
Number of Deaths	55	97	526	6,708
Adult (18+) Patients				
Count at risk during the evaluation period	633	972	5,975	67,563
Person-years*	849.1	1,298.0	7,945.0	89,913.6
Number of Deaths	53	94	521	6,568
Pediatric (<18) Patients				
Count at risk during the evaluation period	105	117	301	4,443
Person-years*	162.6	181.2	440.9	6,256.0
Number of Deaths	2	3	5	140

* Person-years are calculated as days (converted to fractional years). The number of days from 01/01/2018, or from the date of first wait listing until death, reaching 5 years after listing or December 31, 2019.

** Patient mortality after listing describes the relative survival experience of patients after listing. It depends on many factors, some of which are outside of the control of the transplant program. For example, availability of organs may not be the same in every part of the country.

Figure B7. Observed and expected rates of patient mortality after listing: 01/01/2018 - 12/31/2019

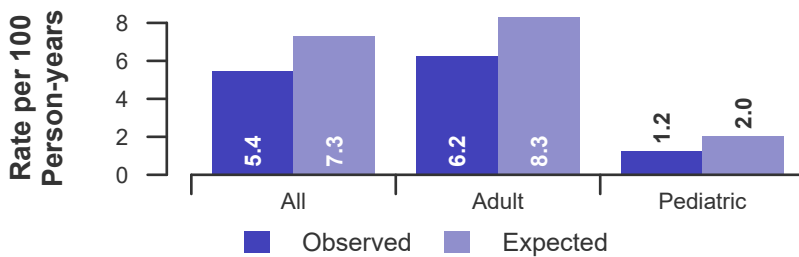


Figure B8. HR estimate of patient mortality after listing

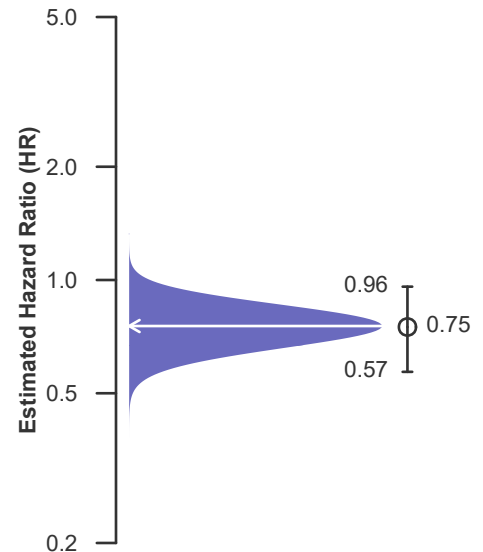
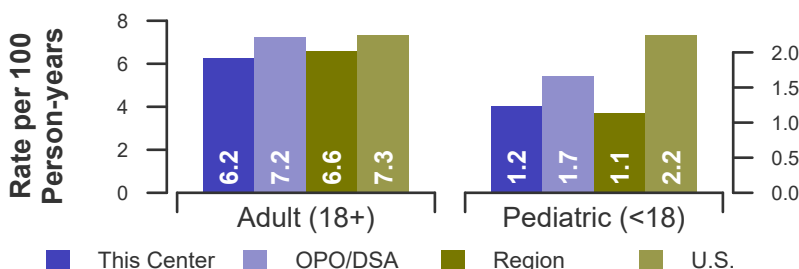


Figure B9. Observed adult (18+) and pediatric (<18) rates of patient mortality after listing: 01/01/2018 - 12/31/2019





B. Waiting List Information

Table B7. Waiting list candidate status after listing
Candidates registered on waiting list between 07/01/2017 and 06/30/2018

Waiting list status (survival status)	This Center (N=160)			U.S. (N=13,030)		
	Months Since Listing			Months Since Listing		
	6	12	18	6	12	18
Alive on waiting list (%)	35.6	13.8	8.8	48.0	27.5	18.1
Died on the waiting list without transplant (%)	2.5	3.1	3.1	4.6	5.9	6.8
Removed without transplant (%):						
Condition worsened (status unknown)	3.1	4.4	5.6	4.5	6.6	7.6
Condition improved (status unknown)	2.5	3.8	4.4	1.2	2.1	2.9
Refused transplant (status unknown)	0.6	1.2	1.2	0.3	0.5	0.6
Other	1.9	3.1	3.1	1.8	3.3	4.4
Transplant (living donor from waiting list only) (%):						
Functioning (alive)	0.0	0.0	0.0	1.8	2.5	1.8
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	0.0	0.0	0.1
Status Yet Unknown**	0.0	0.0	0.0	0.0	0.1	0.9
Transplant (deceased donor) (%):						
Functioning (alive)	48.1	55.0	47.5	33.9	43.7	36.6
Failed-Retransplanted (alive)	0.0	0.0	0.0	0.3	0.4	0.6
Failed-alive not retransplanted	0.0	0.0	0.0	0.0	0.0	0.0
Died	0.6	3.1	3.1	1.7	2.7	3.6
Status Yet Unknown*	5.0	12.5	23.1	1.7	4.2	15.3
Lost or Transferred (status unknown) (%)	0.0	0.0	0.0	0.2	0.5	0.6
TOTAL (%)	100.0	100.0	100.0	100.0	100.0	100.0
Total % known died on waiting list or after transplant	3.1	6.2	6.2	6.3	8.7	10.5
Total % known died or removed as unstable	6.2	10.6	11.9	10.8	15.2	18.1
Total % removed for transplant	53.8	70.6	73.8	39.4	53.7	59.0
Total % with known functioning transplant (alive)	48.1	55.0	47.5	35.7	46.2	38.5

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



B. Waiting List Information

Table B7S1. Medical urgency status 1 candidate status after listing
Candidates registered on the waiting list between 07/01/2017 and 06/30/2018

Waiting list status (survival status)	This Center (N=6)			U.S. (N=432)		
	Months Since listing			Months Since listing		
	6	12	18	6	12	18
Alive on waiting list (%)	0.0	0.0	0.0	4.6	2.1	1.4
Died on the waiting list without transplant (%)	0.0	0.0	0.0	7.2	7.2	7.2
Removed without transplant (%):						
Condition worsened (status unknown)	0.0	0.0	0.0	6.0	6.0	6.0
Condition improved (status unknown)	0.0	0.0	0.0	18.5	20.6	21.3
Refused transplant (status unknown)	0.0	0.0	0.0	0.2	0.2	0.2
Other	0.0	0.0	0.0	0.9	0.9	0.9
Transplant (living donor from waiting list only) (%):						
Functioning (alive)	0.0	0.0	0.0	0.7	0.5	0.5
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	0.0	0.0	0.0
Status Yet Unknown**	0.0	0.0	0.0	0.0	0.2	0.2
Transplant (deceased donor) (%):						
Functioning (alive)	100.0	83.3	50.0	55.3	51.4	42.8
Failed-Retransplanted (alive)	0.0	0.0	0.0	0.7	0.7	0.9
Failed-alive not retransplanted	0.0	0.0	0.0	0.0	0.0	0.0
Died	0.0	0.0	0.0	4.6	5.6	6.2
Status Yet Unknown*	0.0	16.7	50.0	0.9	4.4	12.0
Lost or Transferred (status unknown) (%)	0.0	0.0	0.0	0.2	0.2	0.2
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	11.8	12.7	13.4
Total % known died or removed as unstable	0.0	0.0	0.0	17.8	18.8	19.4
Total % removed for transplant	100.0	100.0	100.0	62.3	62.7	62.7
Total % with known functioning transplant (alive)	100.0	83.3	50.0	56.0	51.9	43.3

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



B. Waiting List Information

Table B8. Percent of candidates with deceased donor transplants: demographic characteristics
Candidates registered on the waiting list between 01/01/2014 and 12/31/2016

Characteristic	N	Percent transplanted at time periods since listing								
		This Center				United States				
		30 day	1 year	2 years	3 years	N	30 day	1 year	2 years	3 years
All	301	29.6	75.1	78.7	80.4	36,338	18.2	46.3	54.2	56.0
Ethnicity/Race*										
White	213	26.3	74.6	78.4	79.8	24,918	18.1	47.3	54.7	56.4
African-American	52	40.4	76.9	82.7	86.5	3,461	21.5	50.7	58.5	60.3
Hispanic/Latino	17	35.3	88.2	88.2	88.2	5,678	17.2	41.4	49.8	51.9
Asian	5	40.0	60.0	60.0	60.0	1,738	16.5	40.7	52.6	54.9
Other	14	28.6	64.3	64.3	64.3	543	17.7	45.3	53.6	55.1
Unknown	0	--	--	--	--	0	--	--	--	--
Age										
<2 years	35	40.0	85.7	85.7	85.7	882	24.0	68.8	73.9	75.2
2-11 years	10	30.0	100.0	100.0	100.0	724	24.2	67.8	73.9	75.3
12-17 years	10	20.0	70.0	80.0	80.0	450	21.3	53.8	64.2	65.8
18-34 years	24	41.7	75.0	75.0	75.0	2,023	26.7	48.4	54.3	56.7
35-49 years	46	32.6	73.9	76.1	76.1	5,644	24.7	48.2	54.0	55.8
50-64 years	129	26.4	72.9	79.1	82.9	20,312	16.4	44.7	53.2	55.2
65-69 years	38	26.3	68.4	71.1	71.1	5,176	14.1	43.1	52.1	53.6
70+ years	9	11.1	77.8	77.8	77.8	1,127	12.8	42.2	49.0	49.2
Gender										
Male	187	29.4	77.5	82.4	83.4	23,058	17.9	47.5	55.8	57.6
Female	114	29.8	71.1	72.8	75.4	13,280	18.8	44.3	51.3	53.2

* 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 B9. Percent of candidates with deceased donor transplants: medical characteristics
Candidates registered on the waiting list between 01/01/2014 and 12/31/2016

Characteristic	N	Percent transplanted at time periods since listing								
		This Center				United States				
		30 day	1 year	2 years	3 years	N	30 day	1 year	2 years	3 years
All	301	29.6	75.1	78.7	80.4	36,338	18.2	46.3	54.2	56.0
Blood Type										
O	142	31.0	74.6	77.5	78.9	16,983	17.9	44.5	52.4	54.3
A	112	20.5	68.8	75.0	76.8	13,256	16.8	44.6	53.0	54.6
B	36	41.7	91.7	91.7	94.4	4,713	19.9	52.2	59.3	61.2
AB	11	63.6	90.9	90.9	90.9	1,386	29.4	66.2	70.4	72.1
Previous Transplant										
Yes	23	43.5	78.3	82.6	82.6	2,014	28.2	50.3	55.4	56.8
No	278	28.4	74.8	78.4	80.2	34,324	17.6	46.1	54.1	55.9
Primary Disease										
Acute Hepatic Necrosis	9	66.7	66.7	66.7	66.7	1,437	47.2	55.0	57.8	58.7
Non-Cholestatic Cirrhosis	195	28.2	73.3	78.5	80.0	24,395	18.4	44.3	51.2	52.9
Cholestatic Liver Disease/Cirrhosis	37	35.1	75.7	78.4	83.8	2,563	15.6	46.8	55.1	58.3
Biliary Atresia	23	30.4	87.0	87.0	87.0	736	16.4	63.6	72.3	73.8
Metabolic Diseases	7	14.3	85.7	85.7	85.7	905	20.6	60.8	67.7	69.3
Malignant Neoplasms	6	16.7	66.7	66.7	66.7	4,406	8.3	47.6	62.2	64.1
Other	24	25.0	79.2	79.2	79.2	1,881	20.4	48.4	56.8	59.0
Missing	0	--	--	--	--	15	13.3	13.3	13.3	13.3
Medical Urgency Status/MELD/PELD at Listing*										
Status 1	0	--	--	--	--	0	--	--	--	--
Status 1A	12	66.7	66.7	66.7	66.7	1,171	60.3	61.2	61.2	61.2
Status 1B	1	100.0	100.0	100.0	100.0	146	42.5	82.9	82.9	82.9
Status 2A	0	--	--	--	--	0	--	--	--	--
Status 2B	0	--	--	--	--	0	--	--	--	--
Status 3	0	--	--	--	--	0	--	--	--	--
MELD 6-10	50	6.0	78.0	80.0	80.0	7,193	2.9	35.8	50.1	52.6
MELD 11-14	38	2.6	60.5	68.4	73.7	6,776	3.3	31.0	41.8	44.6
MELD 15-20	73	19.2	63.0	72.6	76.7	8,297	8.4	41.5	49.8	52.4
MELD 21-30	53	52.8	88.7	88.7	88.7	6,204	27.3	58.3	61.2	61.9
MELD 31-40	28	78.6	85.7	85.7	85.7	4,062	67.3	73.7	73.8	73.8
PELD less than or equal to 10	17	17.6	88.2	88.2	88.2	691	10.4	64.8	73.4	75.4
PELD 11-14	3	33.3	100.0	100.0	100.0	104	19.2	74.0	81.7	82.7
PELD 15-20	13	38.5	92.3	92.3	92.3	178	13.5	72.5	78.1	79.8
PELD 21-30	4	50.0	100.0	100.0	100.0	158	21.5	72.2	77.2	77.2
PELD 31 or greater	1	100.0	100.0	100.0	100.0	72	59.7	80.6	80.6	81.9
Temporarily Inactive	8	0.0	37.5	37.5	37.5	1,286	7.7	34.7	44.4	45.4

* 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 B10. Time to transplant for waiting list candidates*

Candidates registered on the waiting list between 01/01/2014 and 06/30/2019

Percentile	Center	Months to Transplant**		U.S.
		OPO/DSA	Region	
5th	0.1	0.1	0.1	0.1
10th	0.2	0.3	0.2	0.3
25th	1.0	1.3	1.1	1.8
50th (median time to transplant)	3.8	5.7	5.7	10.1
75th	9.3	28.8	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 12/31/2019. 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 B11. Offer Acceptance Practices: 01/01/2019 - 12/31/2019

Offers Acceptance Characteristics	This Center	OPO/DSA	Region	U.S.
Overall				
Number of Offers	988	1,636	13,841	174,762
Number of Acceptances	121	155	770	7,490
Expected Acceptances	64.1	122.0	851.6	7,484.4
Offer Acceptance Ratio*	1.86	1.27	0.90	1.00
95% Credible Interval**	[1.55, 2.20]	--	--	--
PHS increased infectious risk				
Number of Offers	189	364	3,246	34,414
Number of Acceptances	32	44	226	2,100
Expected Acceptances	14.5	34.7	241.5	2,098.7
Offer Acceptance Ratio*	2.06	1.25	0.94	1.00
95% Credible Interval**	[1.43, 2.81]	--	--	--
DCD donor				
Number of Offers	59	114	2,889	52,630
Number of Acceptances	6	11	50	663
Expected Acceptances	5.6	10.6	48.3	674.7
Offer Acceptance Ratio*	1.05	1.03	1.03	0.98
95% Credible Interval**	[0.46, 1.90]	--	--	--
HCV+ donor				
Number of Offers	44	117	848	7,371
Number of Acceptances	13	16	60	457
Expected Acceptances	4.5	14.1	75.2	457.8
Offer Acceptance Ratio*	2.31	1.12	0.80	1.00
95% Credible Interval**	[1.29, 3.61]	--	--	--
Hard-to-Place Livers (Over 50 Offers)				
Number of Offers	394	630	6,264	97,638
Number of Acceptances	7	7	53	633
Expected Acceptances	5.1	8.2	57.7	641.9
Offer Acceptance Ratio*	1.26	0.89	0.92	0.99
95% Credible Interval**	[0.58, 2.21]	--	--	--
Donor more than 500 miles away				
Number of Offers	139	236	3,151	54,690
Number of Acceptances	6	7	62	746
Expected Acceptances	2.9	4.5	46.1	685.4
Offer Acceptance Ratio*	1.64	1.39	1.33	1.09
95% Credible Interval**	[0.71, 2.96]	--	--	--

* The offer acceptance ratio estimates the relative offer acceptance practice of Duke University Hospital (NCDU) 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, [1.55, 2.20], indicates the location of NCDU's true offer acceptance ratio with 95% probability. The best estimate is 86% more likely to accept an offer compared to national acceptance behavior, but NCDU's performance could plausibly range from 55% higher acceptance up to 120% higher acceptance.



B. Waiting List Information

Figure B10. Offer acceptance: Overall

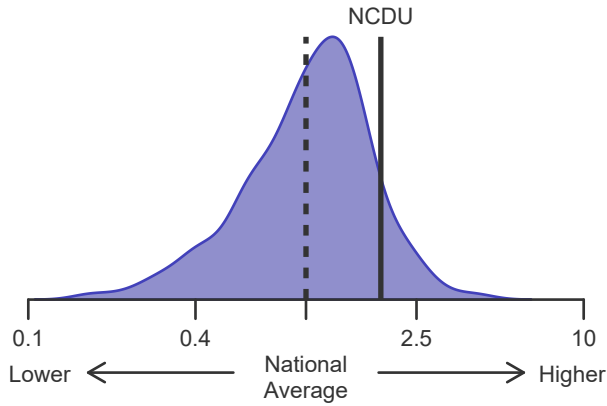


Figure B11. Offer acceptance: PHS increased infectious risk

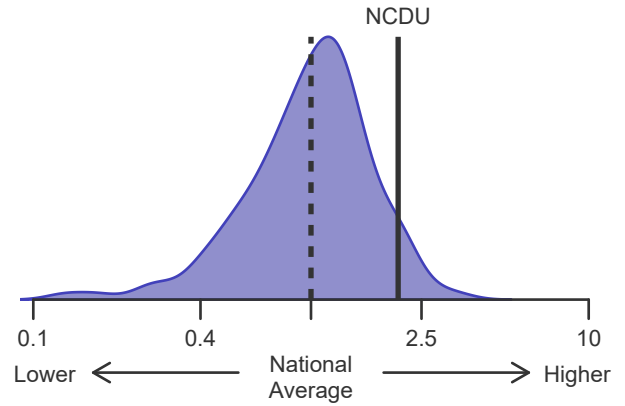


Figure B12. Offer acceptance: DCD Donor

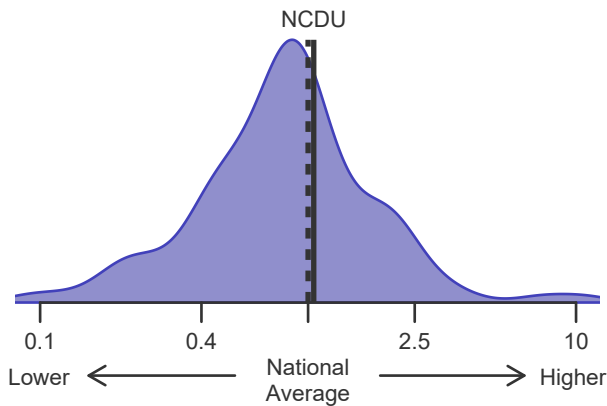


Figure B13. Offer acceptance: HCV+ Donor

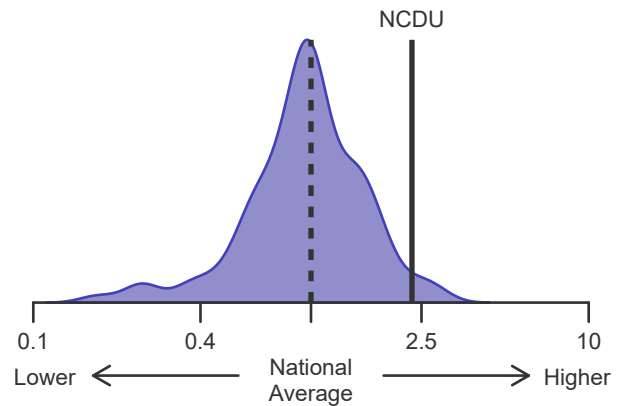


Figure B14. Offer acceptance: Offer number > 50

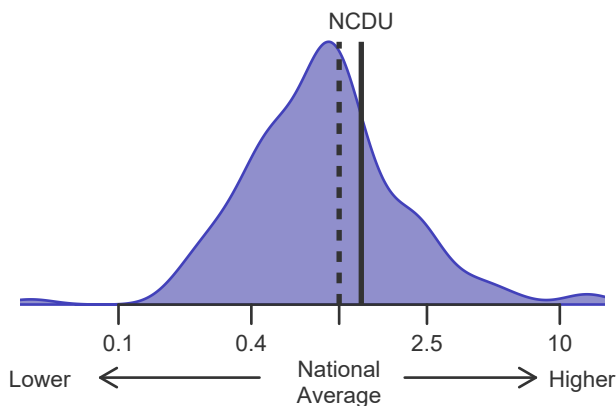
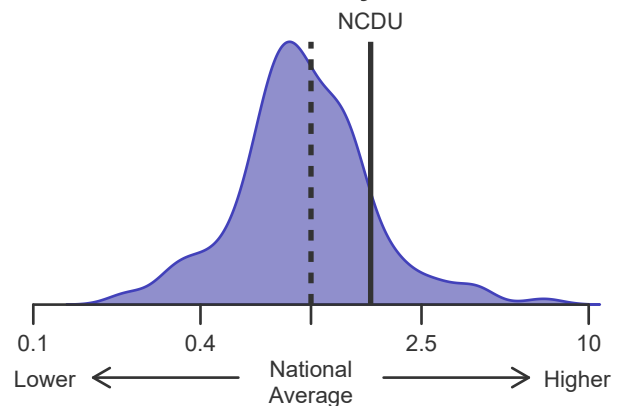


Figure B15. Offer acceptance: Donor more than 500 miles away





C. Transplant Information

Table C1D. Deceased donor transplant recipient demographic characteristics
Patients transplanted between 01/01/2019 and 12/31/2019

Characteristic	Percentage in each category		
	Center (N=139)	Region (N=847)	U.S. (N=8,372)
Ethnicity/Race (%)*			
White	83.5	81.9	69.0
African-American	7.2	11.7	8.1
Hispanic/Latino	3.6	3.3	16.7
Asian	2.2	1.4	4.4
Other	3.6	1.7	1.7
Unknown	0.0	0.0	0.0
Age (%)			
<2 years	5.0	2.5	2.4
2-11 years	2.2	2.7	2.3
12-17	1.4	1.1	1.0
18-34	6.5	5.3	6.1
35-49 years	17.3	18.1	18.0
50-64 years	47.5	50.4	48.5
65-69 years	15.1	15.1	16.1
70+ years	5.0	4.8	5.6
Gender (%)			
Male	59.7	63.3	63.6
Female	40.3	36.7	36.4

* 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 01/01/2019 and 12/31/2019

Characteristic	Percentage in each category		
	Center (N=2)	Region (N=14)	U.S. (N=524)
Ethnicity/Race (%)*			
White	50.0	85.7	77.7
African-American	50.0	14.3	4.0
Hispanic/Latino	0.0	0.0	12.8
Asian	0.0	0.0	3.6
Other	0.0	0.0	1.9
Unknown	0.0	0.0	0.0
Age (%)			
<2 years	50.0	7.1	9.9
2-11 years	0.0	0.0	4.2
12-17	0.0	0.0	1.0
18-34	0.0	0.0	11.1
35-49 years	0.0	21.4	14.3
50-64 years	50.0	35.7	39.9
65-69 years	0.0	35.7	16.4
70+ years	0.0	0.0	3.2
Gender (%)			
Male	50.0	35.7	51.5
Female	50.0	64.3	48.5

* 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 01/01/2019 and 12/31/2019

Characteristic	Percentage in each category		
	Center (N=139)	Region (N=847)	U.S. (N=8,372)
Blood Type (%)			
O	45.3	47.9	45.4
A	39.6	36.2	36.2
B	12.2	12.5	13.6
AB	2.9	3.3	4.8
Previous Transplant (%)			
Yes	2.2	3.2	4.6
No	97.8	96.8	95.4
Body Mass Index (%)			
0-20	12.2	9.8	11.2
21-25	22.3	25.1	26.4
26-30	30.2	29.2	31.0
31-35	18.0	21.1	18.8
36-40	16.5	11.0	8.4
41+	0.7	3.5	3.5
Unknown	0.0	0.2	0.7
Primary Disease (%)			
Acute Hepatic Necrosis	2.9	4.1	4.6
Non-Cholestatic Cirrhosis	54.0	69.8	63.5
Cholestatic Liver Disease/Cirrhosis	8.6	8.0	6.8
Biliary Atresia	2.2	1.9	2.2
Metabolic Diseases	4.3	3.8	3.3
Malignant Neoplasms	23.7	9.4	15.8
Other	4.3	3.0	3.7
Missing	0.0	0.0	0.1
Medical Urgency Statust/MELD/PELD at Transplant (%)*			
Status 1A	1.4	2.6	3.1
Status 1B	1.4	1.9	1.6
MELD 6-10	11.5	9.6	12.6
MELD 11-14	14.4	12.5	13.0
MELD 15-20	30.2	26.3	20.8
MELD 21-30	28.1	28.0	24.7
MELD 31-40	7.2	16.3	21.4
PELD less than or equal to 10	2.9	1.5	1.3
PELD 11-14	0.0	0.1	0.4
PELD 15-20	0.0	0.6	0.4
PELD 21-30	0.7	0.2	0.4
PELD 31 or greater	2.2	0.4	0.2
Temporarily Inactive	0.0	0.0	0.0
Recipient Medical Condition at Transplant (%)			
Not Hospitalized	79.9	72.6	65.8
Hospitalized	15.1	15.7	19.6
ICU	5.0	11.6	14.5
Unknown	0.0	0.1	0.0

* 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 01/01/2019 and 12/31/2019

Characteristic	Percentage in each category		
	Center (N=2)	Region (N=14)	U.S. (N=524)
Blood Type (%)			
O	50.0	14.3	45.8
A	50.0	71.4	41.4
B	0.0	14.3	9.9
AB	0.0	0.0	2.9
Previous Transplant (%)			
Yes	0.0	0.0	1.5
No	100.0	100.0	98.5
Body Mass Index (%)			
0-20	50.0	7.1	22.1
21-25	50.0	21.4	31.7
26-30	0.0	42.9	26.5
31-35	0.0	21.4	12.6
36-40	0.0	0.0	4.2
41+	0.0	0.0	1.7
Unknown	0.0	7.1	1.1
Primary Disease (%)			
Acute Hepatic Necrosis	0.0	0.0	2.1
Non-Cholestatic Cirrhosis	0.0	50.0	46.0
Cholestatic Liver Disease/Cirrhosis	50.0	28.6	21.6
Biliary Atresia	0.0	7.1	10.5
Metabolic Diseases	50.0	7.1	4.0
Malignant Neoplasms	0.0	7.1	12.8
Other	0.0	0.0	3.1
Missing	0.0	0.0	0.0
Medical Urgency Statust/MELD/PELD at Transplant (%)*			
Status 1A	0.0	0.0	0.6
Status 1B	50.0	7.1	1.3
MELD 6-10	0.0	0.0	17.7
MELD 11-14	0.0	21.4	23.3
MELD 15-20	0.0	35.7	25.8
MELD 21-30	50.0	35.7	16.4
MELD 31-40	0.0	0.0	1.5
PELD less than or equal to 10	0.0	0.0	5.2
PELD 11-14	0.0	0.0	1.1
PELD 15-20	0.0	0.0	2.3
PELD 21-30	0.0	0.0	2.3
PELD 31 or greater	0.0	0.0	1.1
Temporarily Inactive	0.0	0.0	1.3
Recipient Medical Condition at Transplant (%)			
Not Hospitalized	100.0	78.6	87.8
Hospitalized	0.0	7.1	9.2
ICU	0.0	7.1	2.9
Unknown	0.0	7.1	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 C3D. Deceased donor characteristics
Transplants performed between 01/01/2019 and 12/31/2019

Donor Characteristic	Percentage in each category		
	Center (N=139)	Region (N=847)	U.S. (N=8,372)
Cause of Death (%)			
Deceased: Stroke	26.6	26.9	27.4
Deceased: MVA	13.7	14.2	12.7
Deceased: Other	59.7	58.9	59.9
Ethnicity/Race (%)*			
White	69.8	68.2	62.8
African-American	23.0	24.9	17.9
Hispanic/Latino	5.8	4.6	15.2
Asian	1.4	0.9	2.9
Other	0.0	1.3	1.1
Not Reported	0.0	0.0	0.0
Age (%)			
<2 years	1.4	0.4	1.2
2-11 years	4.3	2.4	2.6
12-17	2.2	5.4	4.5
18-34	26.6	33.9	32.3
35-49 years	34.5	30.1	27.4
50-64 years	25.2	22.2	24.5
65-69 years	3.6	3.5	3.8
70+ years	2.2	2.1	3.6
Gender (%)			
Male	58.3	58.8	60.3
Female	41.7	41.2	39.7
Blood Type (%)			
O	46.8	50.3	48.3
A	38.1	36.6	37.0
B	14.4	11.7	11.9
AB	0.7	1.4	2.8
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 01/01/2019 and 12/31/2019

Donor Characteristic	Percentage in each category		
	Center (N=2)	Region (N=14)	U.S. (N=524)
Ethnicity/Race (%)*			
White	50.0	85.7	80.5
African-American	50.0	14.3	4.0
Hispanic/Latino	0.0	0.0	9.4
Asian	0.0	0.0	3.2
Other	0.0	0.0	2.9
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	35.7	41.8
35-49 years	50.0	35.7	42.7
50-64 years	0.0	28.6	15.1
65-69 years	0.0	0.0	0.0
70+ years	0.0	0.0	0.0
Gender (%)			
Male	0.0	28.6	47.3
Female	100.0	71.4	52.7
Blood Type (%)			
O	100.0	71.4	64.3
A	0.0	28.6	28.1
B	0.0	0.0	6.5
AB	0.0	0.0	1.1
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 01/01/2019 and 12/31/2019

Transplant Characteristic	Percentage in each category		
	Center (N=139)	Region (N=847)	U.S. (N=8,372)
Cold Ischemic Time (Hours): Local (%)			
Deceased: 0-5 hr	88.9	77.2	65.5
Deceased: 6-10 hr	11.1	22.1	32.2
Deceased: 11-15 hr	0.0	0.2	1.4
Deceased: 16-20 hr	0.0	0.2	0.1
Deceased: 21+ hr	0.0	0.0	0.1
Not Reported	0.0	0.4	0.8
Cold Ischemic Time (Hours): Shared (%)			
Deceased: 0-5 hr	53.1	52.0	40.7
Deceased: 6-10 hr	46.9	46.1	55.3
Deceased: 11-15 hr	0.0	0.3	3.0
Deceased: 16-20 hr	0.0	0.6	0.2
Deceased: 21+ hr	0.0	0.0	0.1
Not Reported	0.0	0.9	0.6
Procedure Type (%)			
Liver alone	87.8	91.3	90.1
Liver and another organ	12.2	8.7	9.9
Sharing (%)			
Local	64.7	62.1	63.3
Shared	35.3	37.9	36.7
Median Time in Hospital After Transplant*	9.0 Days	8.0 Days	10.0 Days

* Multiple organ transplants are excluded from this statistic.



C. Transplant Information

Table C4L. Living donor transplant characteristics
Transplants performed between 01/01/2019 and 12/31/2019

Transplant Characteristic	Percentage in each category		
	Center (N=2)	Region (N=14)	U.S. (N=524)
Relation with Donor (%)			
Related	50.0	50.0	51.0
Unrelated	50.0	50.0	49.0
Not Reported	0.0	0.0	0.0
Procedure Type (%)			
Liver alone	100.0	100.0	100.0
Liver and another organ	0.0	0.0	0.0
Median Time in Hospital After Transplant*	13.5 Days	13.5 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 01/01/2017 and 06/30/2019
Deaths and retransplants are considered graft failures

	NCDU	U.S.
Number of transplants evaluated	194	17,388
Estimated probability of surviving with a functioning graft at 1 month (unadjusted for patient and donor characteristics)	97.94%	96.64%
Expected probability of surviving with a functioning graft at 1 month (adjusted for patient and donor characteristics)	97.04%	--
Number of observed graft failures (including deaths) during the first month after transplant	4	585
Number of expected graft failures (including deaths) during the first month after transplant	5.76	--
Estimated hazard ratio*	0.77	--
95% credible interval for the hazard ratio**	[0.28, 1.50]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.28, 1.50], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 23% lower risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 72% reduced risk up to 50% increased risk.

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

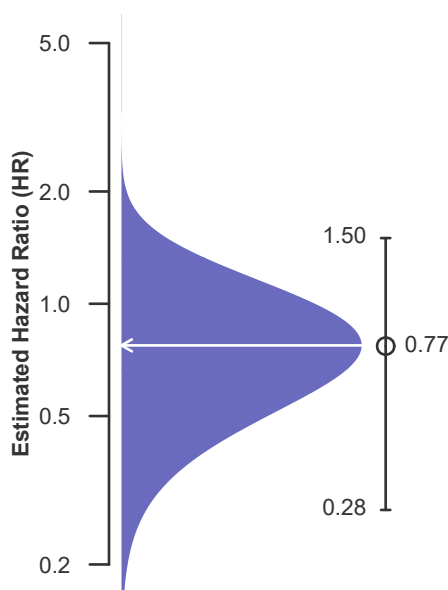
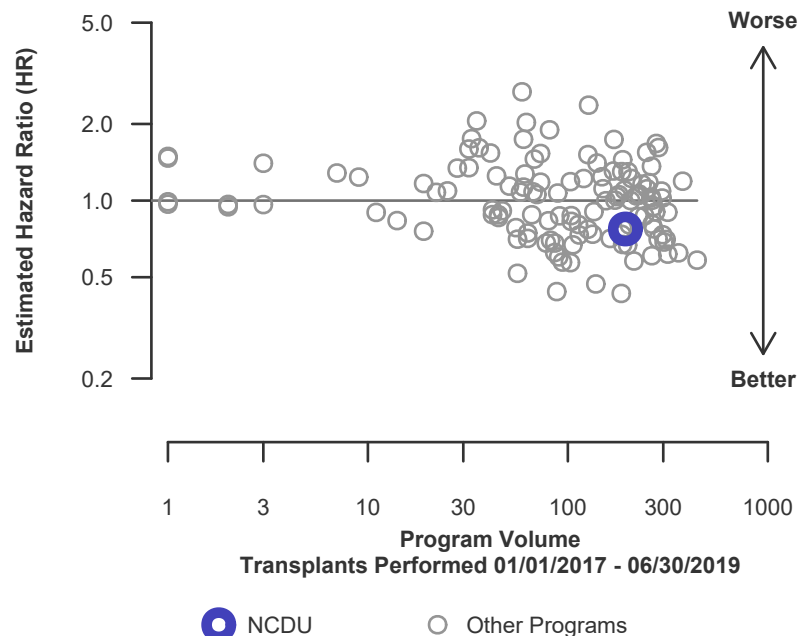


Figure C2. Adult (18+) 1-month graft failure HR program comparison





C. Transplant Information

Table C5D. Adult (18+) 1-month survival with a functioning deceased donor graft
Single organ transplants performed between 01/01/2017 and 06/30/2019
Deaths and retransplants are considered graft failures

	NCDU	U.S.
Number of transplants evaluated	194	16,543
Estimated probability of surviving with a functioning graft at 1 month (unadjusted for patient and donor characteristics)	97.94%	96.61%
Expected probability of surviving with a functioning graft at 1 month (adjusted for patient and donor characteristics)	97.04%	--
Number of observed graft failures (including deaths) during the first month after transplant	4	560
Number of expected graft failures (including deaths) during the first month after transplant	5.76	--
Estimated hazard ratio*	0.77	--
95% credible interval for the hazard ratio**	[0.28, 1.50]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.28, 1.50], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 23% lower risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 72% reduced risk up to 50% increased risk.

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

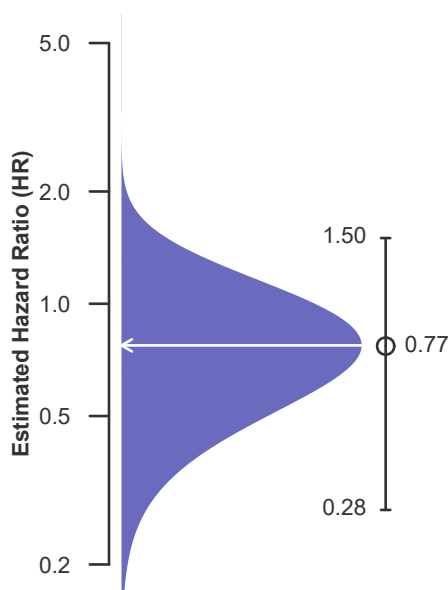
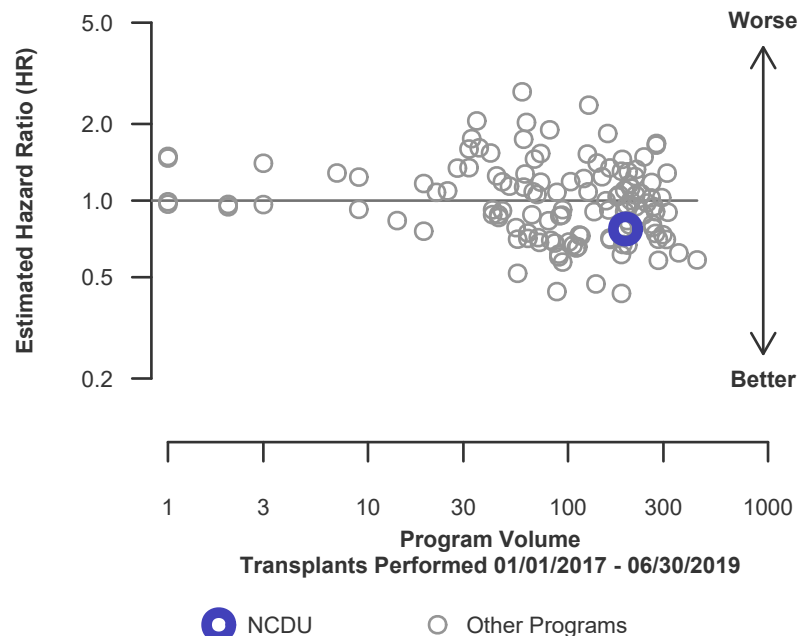


Figure C2D. Adult (18+) 1-month deceased donor graft failure HR program comparison





C. Transplant Information

Table C5L. Adult (18+) 1-month survival with a functioning living donor graft
Single organ transplants performed between 01/01/2017 and 06/30/2019
Deaths and retransplants are considered graft failures

This center did not perform any
transplants relevant to
this table during
01/01/2017-06/30/2019

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

This center did not perform any
transplants relevant to
this figure during
01/01/2017-06/30/2019

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

This center did not perform any
transplants relevant to
this figure during
01/01/2017-06/30/2019



C. Transplant Information

Table C6. Adult (18+) 1-year survival with a functioning graft
Single organ transplants performed between 01/01/2017 and 06/30/2019
Deaths and retransplants are considered graft failures

	NCDU	U.S.
Number of transplants evaluated	194	17,388
Estimated probability of surviving with a functioning graft at 1 year (unadjusted for patient and donor characteristics)	94.23%	91.77%
Expected probability of surviving with a functioning graft at 1 year (adjusted for patient and donor characteristics)	92.45%	--
Number of observed graft failures (including deaths) during the first year after transplant	10	1,352
Number of expected graft failures (including deaths) during the first year after transplant	13.90	--
Estimated hazard ratio*	0.75	--
95% credible interval for the hazard ratio**	[0.39, 1.24]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.39, 1.24], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 25% lower risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 61% reduced risk up to 24% increased risk.

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

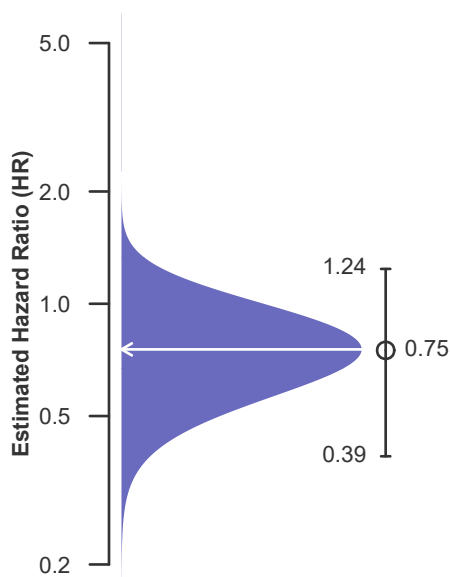
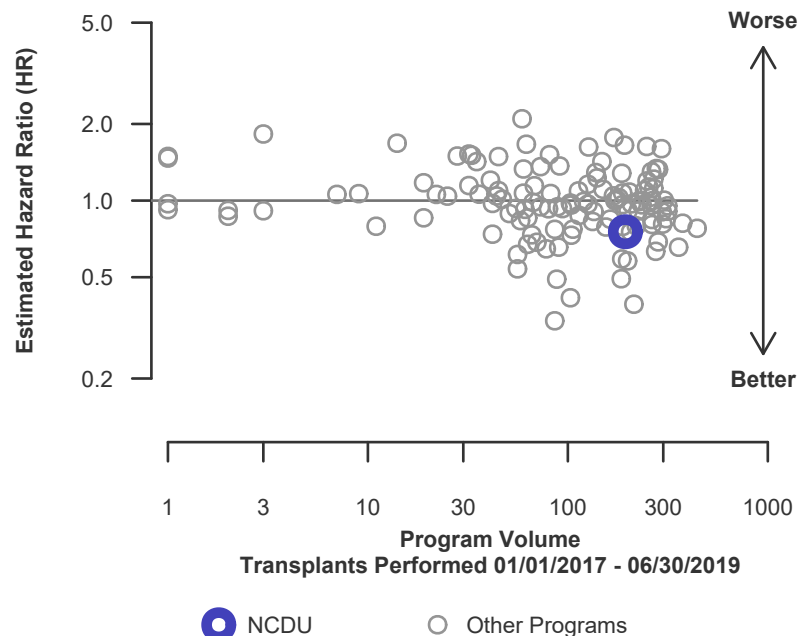


Figure C4. Adult (18+) 1-year graft failure HR program comparison





C. Transplant Information

Table C6D. Adult (18+) 1-year survival with a functioning deceased donor graft
Single organ transplants performed between 01/01/2017 and 06/30/2019
Deaths and retransplants are considered graft failures

	NCDU	U.S.
Number of transplants evaluated	194	16,543
Estimated probability of surviving with a functioning graft at 1 year (unadjusted for patient and donor characteristics)	94.23%	91.70%
Expected probability of surviving with a functioning graft at 1 year (adjusted for patient and donor characteristics)	92.45%	--
Number of observed graft failures (including deaths) during the first year after transplant	10	1,298
Number of expected graft failures (including deaths) during the first year after transplant	13.90	--
Estimated hazard ratio*	0.75	--
95% credible interval for the hazard ratio**	[0.39, 1.24]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.39, 1.24], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 25% lower risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 61% reduced risk up to 24% increased risk.

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

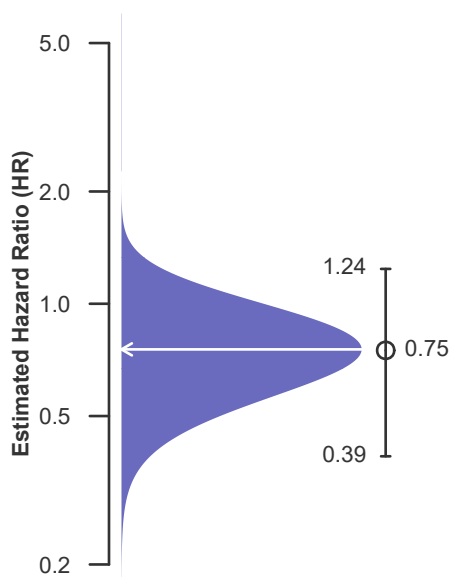
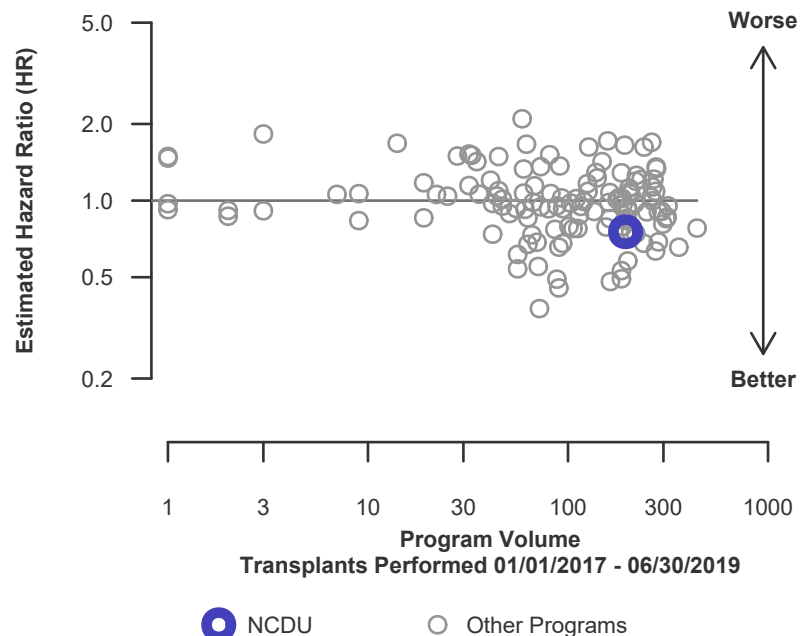


Figure C4D. Adult (18+) 1-year deceased donor graft failure HR program comparison





C. Transplant Information

Table C6L. Adult (18+) 1-year survival with a functioning living donor graft
Single organ transplants performed between 01/01/2017 and 06/30/2019
Deaths and retransplants are considered graft failures

This center did not perform any
transplants relevant to
this table during
01/01/2017-06/30/2019

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

This center did not perform any
transplants relevant to
this figure during
01/01/2017-06/30/2019

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

This center did not perform any
transplants relevant to
this figure during
01/01/2017-06/30/2019



C. Transplant Information

Table C7. Adult (18+) 3-year survival with a functioning graft
Single organ transplants performed between 07/01/2014 and 12/31/2016
Deaths and retransplants are considered graft failures

	NCDU	U.S.
Number of transplants evaluated	160	15,208
Estimated probability of surviving with a functioning graft at 3 years (unadjusted for patient and donor characteristics)	90.00%	84.64%
Expected probability of surviving with a functioning graft at 3 years (adjusted for patient and donor characteristics)	85.75%	--
Number of observed graft failures (including deaths) during the first 3 years after transplant	16	2,336
Number of expected graft failures (including deaths) during the first 3 years after transplant	23.65	--
Estimated hazard ratio*	0.70	--
95% credible interval for the hazard ratio**	[0.42, 1.06]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.42, 1.06], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 30% lower risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 58% reduced risk up to 6% increased risk.

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

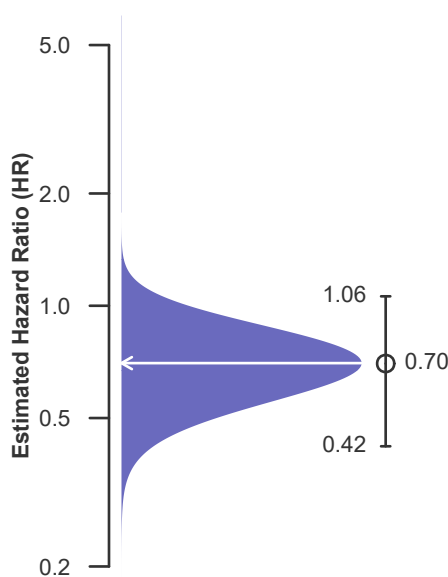
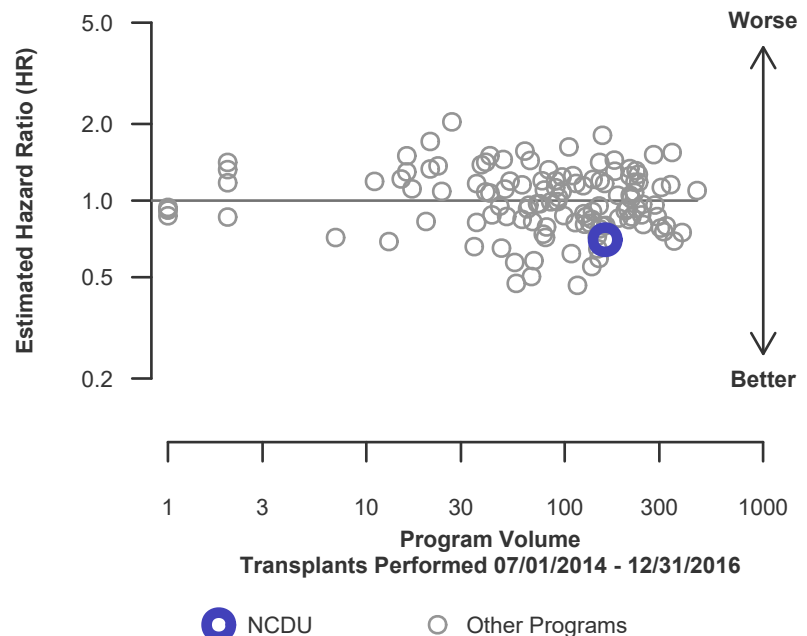


Figure C6. Adult (18+) 3-year graft failure HR program comparison





C. Transplant Information

Table C7D. Adult (18+) 3-year survival with a functioning deceased donor graft
Single organ transplants performed between 07/01/2014 and 12/31/2016
Deaths and retransplants are considered graft failures

	NCDU	U.S.
Number of transplants evaluated	155	14,521
Estimated probability of surviving with a functioning graft at 3 years (unadjusted for patient and donor characteristics)	90.97%	84.66%
Expected probability of surviving with a functioning graft at 3 years (adjusted for patient and donor characteristics)	85.80%	--
Number of observed graft failures (including deaths) during the first 3 years after transplant	14	2,228
Number of expected graft failures (including deaths) during the first 3 years after transplant	23.01	--
Estimated hazard ratio*	0.64	--
95% credible interval for the hazard ratio**	[0.37, 0.99]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.37, 0.99], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 36% lower risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 63% reduced risk up to 1% reduced risk.

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

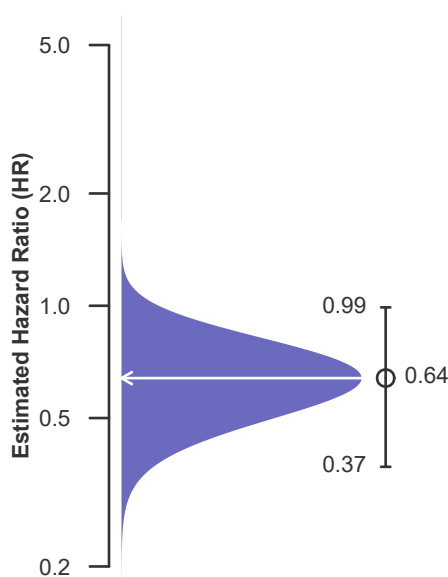
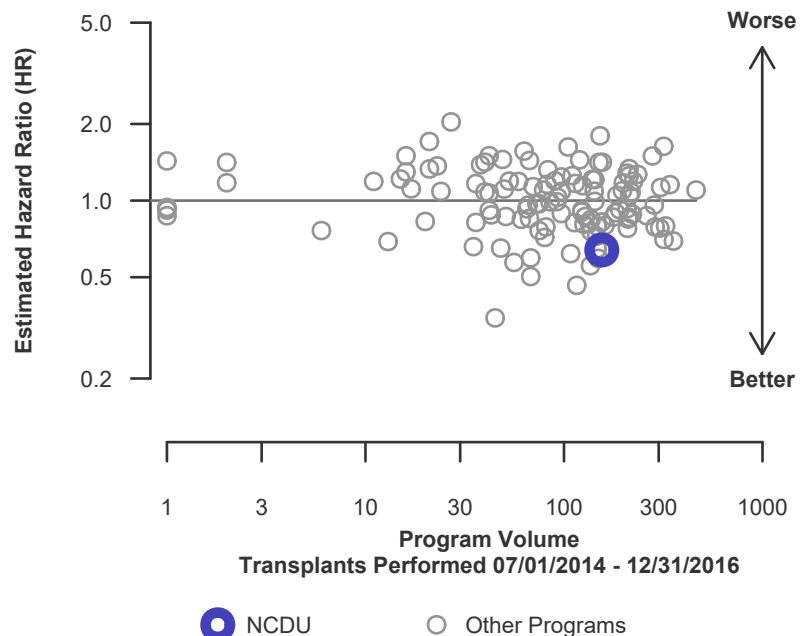


Figure C6D. Adult (18+) 3-year deceased donor graft failure HR program comparison





C. Transplant Information

Table C7L. Adult (18+) 3-year survival with a functioning living donor graft
Single organ transplants performed between 07/01/2014 and 12/31/2016
Deaths and retransplants are considered graft failures

	NCDU	U.S.
Number of transplants evaluated	5	687
Estimated probability of surviving with a functioning graft at 3 years (unadjusted for patient and donor characteristics)	60.00%	84.28%
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	2	108
Number of expected graft failures (including deaths) during the first 3 years after transplant	0.64	--
Estimated hazard ratio*	1.52	--
95% credible interval for the hazard ratio**	[0.41, 3.32]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.41, 3.32], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 52% higher risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 59% reduced risk up to 232% increased risk.

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

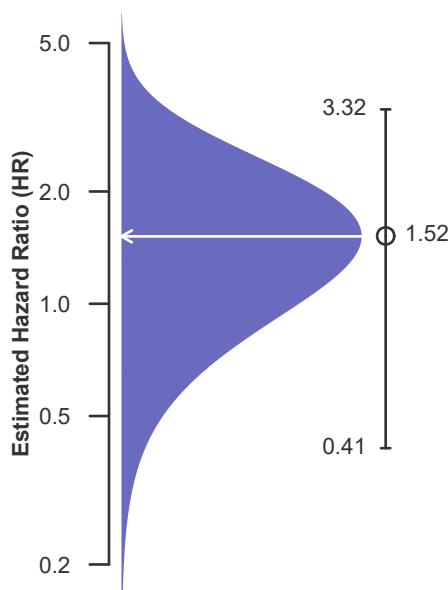
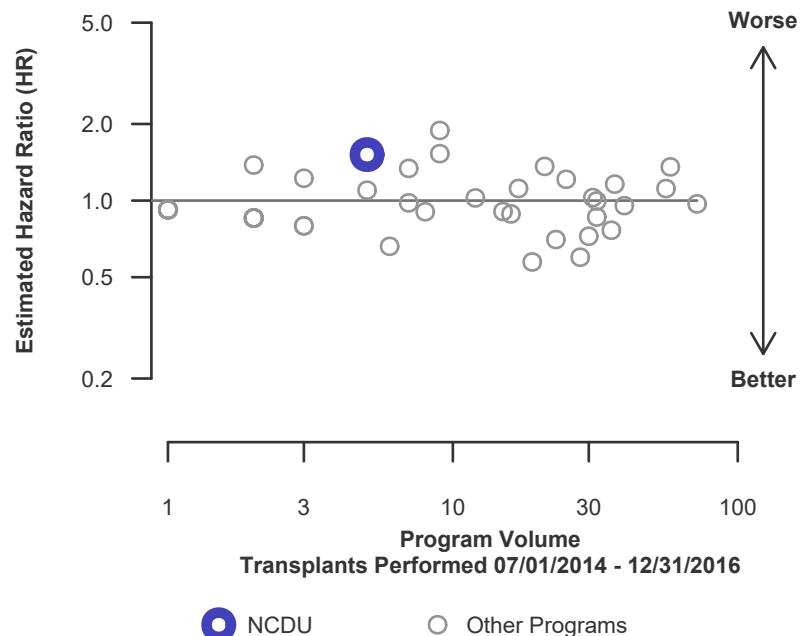


Figure C6L. Adult (18+) 3-year living donor graft failure HR program comparison





C. Transplant Information

Table C8. Pediatric (<18) 1-month survival with a functioning graft
Single organ transplants performed between 01/01/2017 and 06/30/2019
Deaths and retransplants are considered graft failures

	NCDU	U.S.
Number of transplants evaluated	36	1,348
Estimated probability of surviving with a functioning graft at 1 month (unadjusted for patient and donor characteristics)	100.00%	95.47%
Expected probability of surviving with a functioning graft at 1 month (adjusted for patient and donor characteristics)	95.96%	--
Number of observed graft failures (including deaths) during the first month after transplant	0	61
Number of expected graft failures (including deaths) during the first month after transplant	1.49	--
Estimated hazard ratio*	0.57	--
95% credible interval for the hazard ratio**	[0.07, 1.60]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.07, 1.60], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 43% lower risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 93% reduced risk up to 60% increased risk.

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

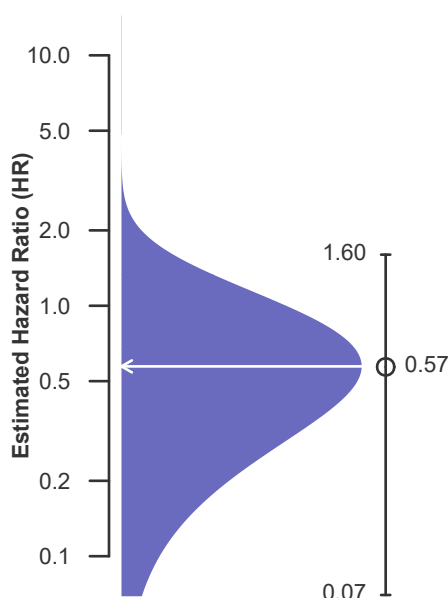
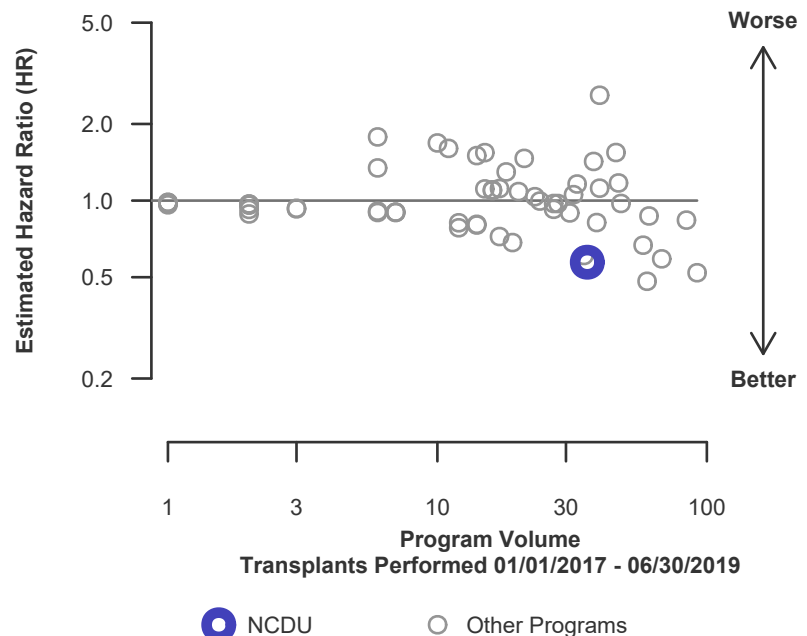


Figure C8. Pediatric (<18) 1-month graft failure HR program comparison





C. Transplant Information

Table C8D. Pediatric (<18) 1-month survival with a functioning deceased donor graft
Single organ transplants performed between 01/01/2017 and 06/30/2019
Deaths and retransplants are considered graft failures

	NCDU	U.S.
Number of transplants evaluated	35	1,178
Estimated probability of surviving with a functioning graft at 1 month (unadjusted for patient and donor characteristics)	100.00%	95.25%
Expected probability of surviving with a functioning graft at 1 month (adjusted for patient and donor characteristics)	95.93%	--
Number of observed graft failures (including deaths) during the first month after transplant	0	56
Number of expected graft failures (including deaths) during the first month after transplant	1.46	--
Estimated hazard ratio*	0.58	--
95% credible interval for the hazard ratio**	[0.07, 1.61]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.07, 1.61], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 42% lower risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 93% reduced risk up to 61% increased risk.

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

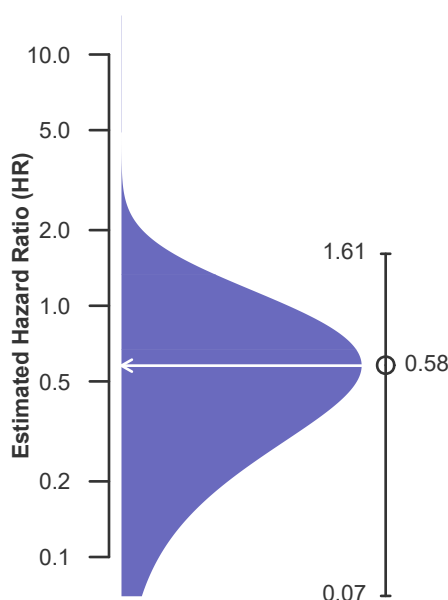
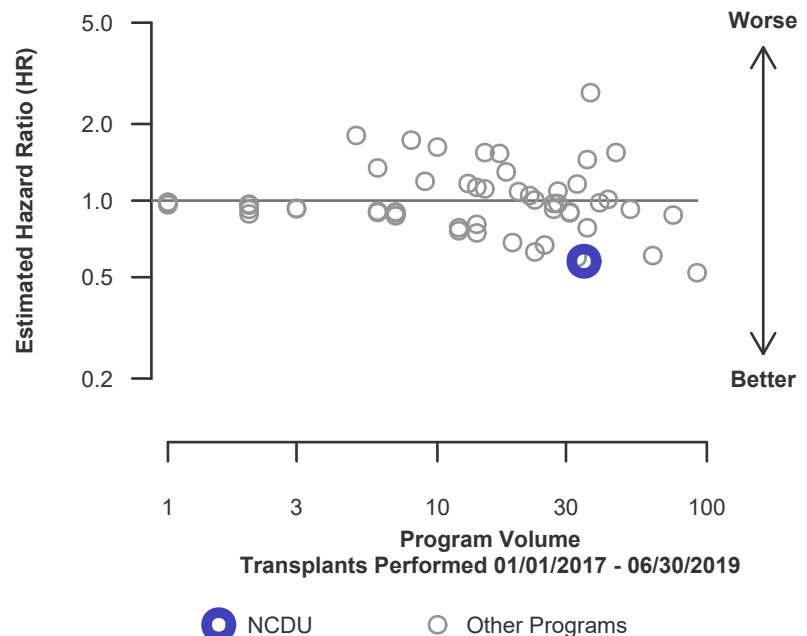


Figure C8D. Pediatric (<18) 1-month deceased donor graft failure HR program comparison





C. Transplant Information

Table C8L. Pediatric (<18) 1-month survival with a functioning living donor graft
Single organ transplants performed between 01/01/2017 and 06/30/2019
Deaths and retransplants are considered graft failures

	NCDU	U.S.
Number of transplants evaluated	1	170
Estimated probability of surviving with a functioning graft at 1 month (unadjusted for patient and donor characteristics)	100.00%	97.06%
Expected probability of surviving with a functioning graft at 1 month (adjusted for patient and donor characteristics)	97.07%	--
Number of observed graft failures (including deaths) during the first month after transplant	0	5
Number of expected graft failures (including deaths) during the first month after transplant	0.03	--
Estimated hazard ratio*	0.99	--
95% credible interval for the hazard ratio**	[0.12, 2.75]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.12, 2.75], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 1% lower risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 88% reduced risk up to 175% increased risk.

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

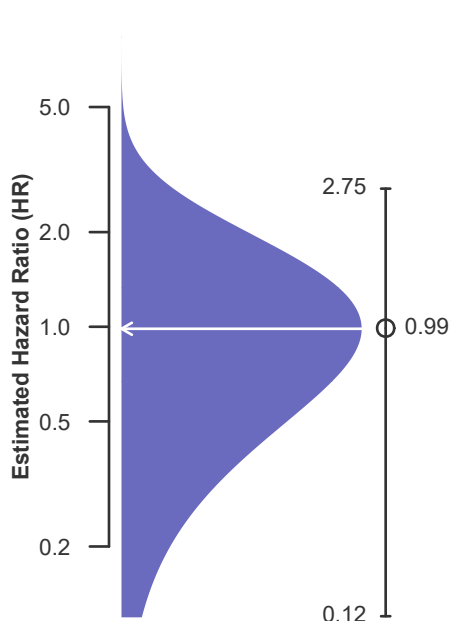
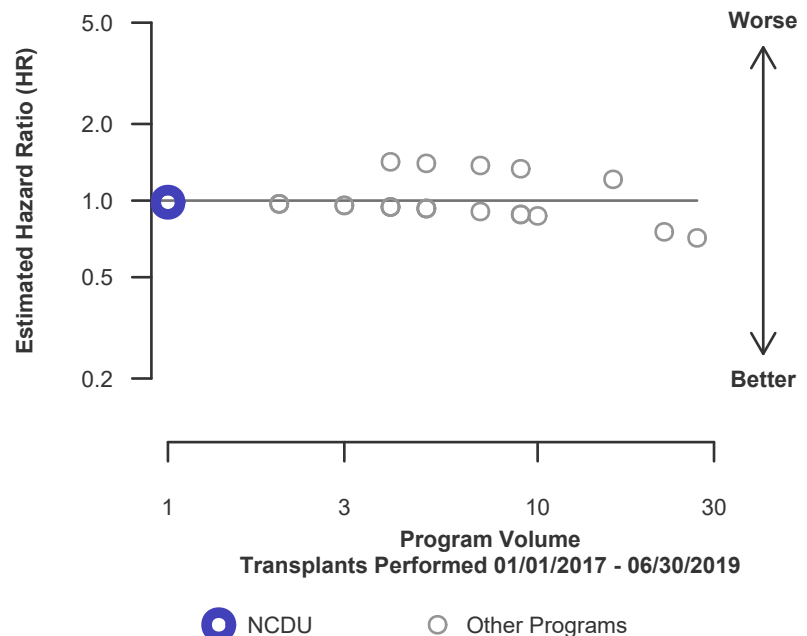


Figure C8L. Pediatric (<18) 1-month living donor graft failure HR program comparison





C. Transplant Information

Table C9. Pediatric (<18) 1-year survival with a functioning graft
Single organ transplants performed between 01/01/2017 and 06/30/2019
Deaths and retransplants are considered graft failures

	NCDU	U.S.
Number of transplants evaluated	36	1,348
Estimated probability of surviving with a functioning graft at 1 year (unadjusted for patient and donor characteristics)	100.00%	92.68%
Expected probability of surviving with a functioning graft at 1 year (adjusted for patient and donor characteristics)	92.78%	--
Number of observed graft failures (including deaths) during the first year after transplant	0	97
Number of expected graft failures (including deaths) during the first year after transplant	2.67	--
Estimated hazard ratio*	0.43	--
95% credible interval for the hazard ratio**	[0.05, 1.19]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.05, 1.19], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 57% lower risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 95% reduced risk up to 19% increased risk.

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

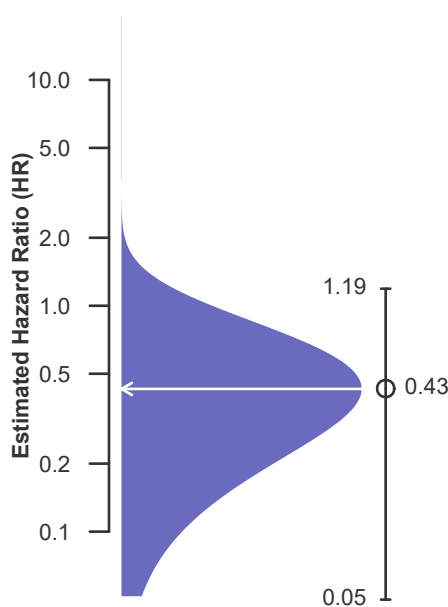
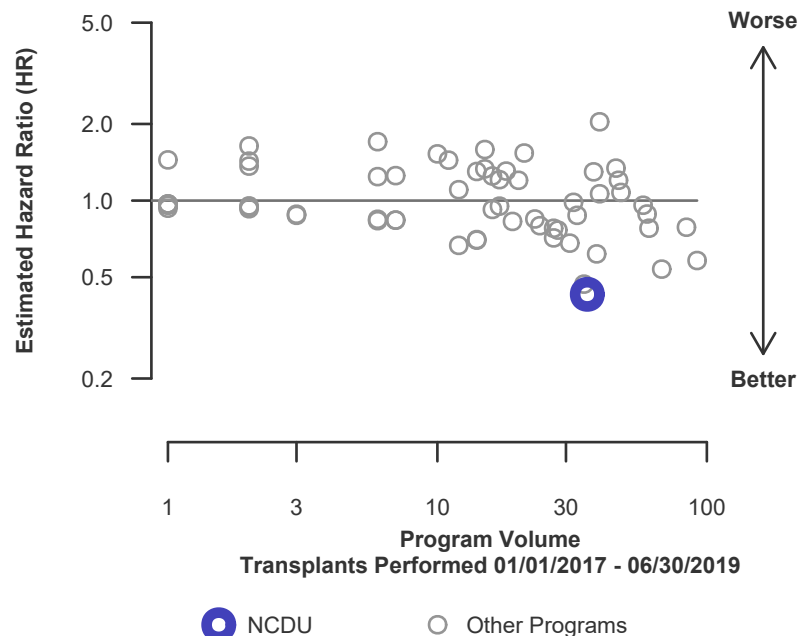


Figure C10. Pediatric (<18) 1-year graft failure HR program comparison





C. Transplant Information

Table C9D. Pediatric (<18) 1-year survival with a functioning deceased donor graft
Single organ transplants performed between 01/01/2017 and 06/30/2019
Deaths and retransplants are considered graft failures

	NCDU	U.S.
Number of transplants evaluated	35	1,178
Estimated probability of surviving with a functioning graft at 1 year (unadjusted for patient and donor characteristics)	100.00%	92.30%
Expected probability of surviving with a functioning graft at 1 year (adjusted for patient and donor characteristics)	92.71%	--
Number of observed graft failures (including deaths) during the first year after transplant	0	89
Number of expected graft failures (including deaths) during the first year after transplant	2.62	--
Estimated hazard ratio*	0.43	--
95% credible interval for the hazard ratio**	[0.05, 1.21]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.05, 1.21], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 57% lower risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 95% reduced risk up to 21% increased risk.

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

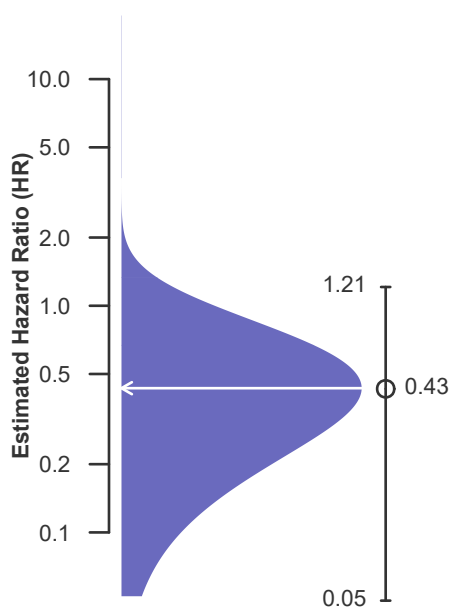
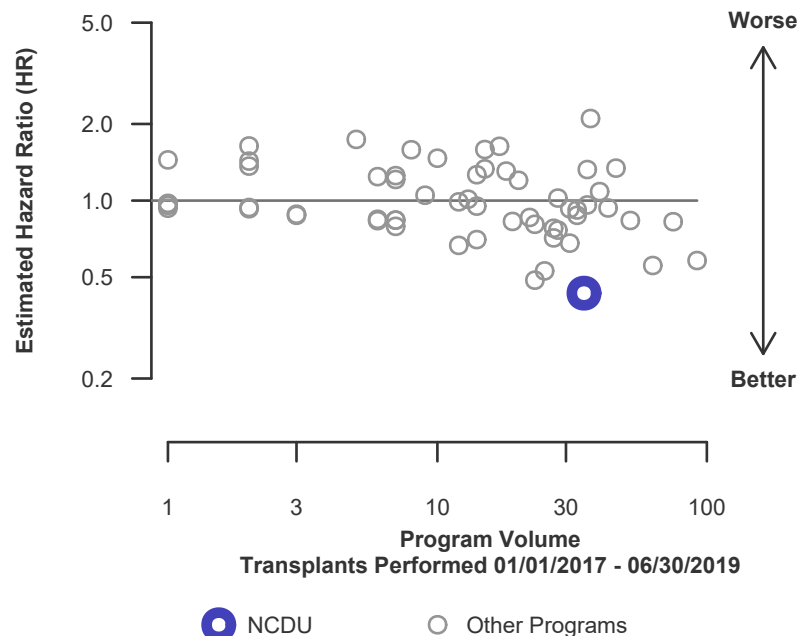


Figure C10D. Pediatric (<18) 1-year deceased donor graft failure HR program comparison





C. Transplant Information

Table C9L. Pediatric (<18) 1-year survival with a functioning living donor graft
Single organ transplants performed between 01/01/2017 and 06/30/2019
Deaths and retransplants are considered graft failures

	NCDU	U.S.
Number of transplants evaluated	1	170
Estimated probability of surviving with a functioning graft at 1 year (unadjusted for patient and donor characteristics)	100.00%	95.29%
Expected probability of surviving with a functioning graft at 1 year (adjusted for patient and donor characteristics)	95.31%	--
Number of observed graft failures (including deaths) during the first year after transplant	0	8
Number of expected graft failures (including deaths) during the first year after transplant	0.05	--
Estimated hazard ratio*	0.98	--
95% credible interval for the hazard ratio**	[0.12, 2.72]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.12, 2.72], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 2% lower risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 88% reduced risk up to 172% increased risk.

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

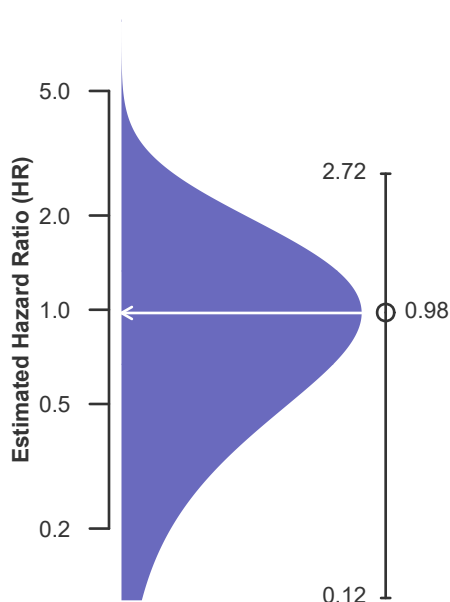
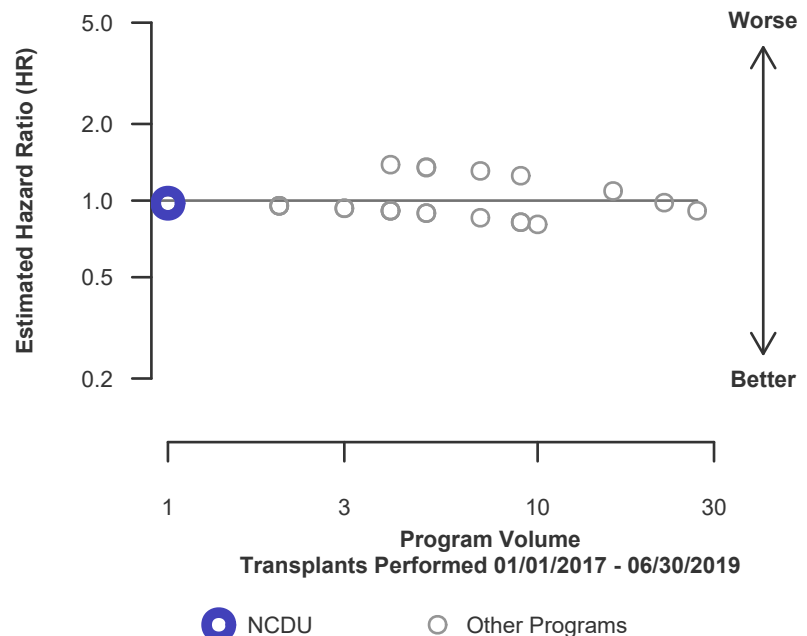


Figure C10L. Pediatric (<18) 1-year living donor graft failure HR program comparison





C. Transplant Information

Table C10. Pediatric (<18) 3-year survival with a functioning graft
Single organ transplants performed between 07/01/2014 and 12/31/2016
Deaths and retransplants are considered graft failures

	NCDU	U.S.
Number of transplants evaluated	33	1,304
Estimated probability of surviving with a functioning graft at 3 years (unadjusted for patient and donor characteristics)	93.94%	88.73%
Expected probability of surviving with a functioning graft at 3 years (adjusted for patient and donor characteristics)	88.51%	--
Number of observed graft failures (including deaths) during the first 3 years after transplant	2	147
Number of expected graft failures (including deaths) during the first 3 years after transplant	3.83	--
Estimated hazard ratio*	0.69	--
95% credible interval for the hazard ratio**	[0.19, 1.50]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.19, 1.50], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 31% lower risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 81% reduced risk up to 50% increased risk.

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

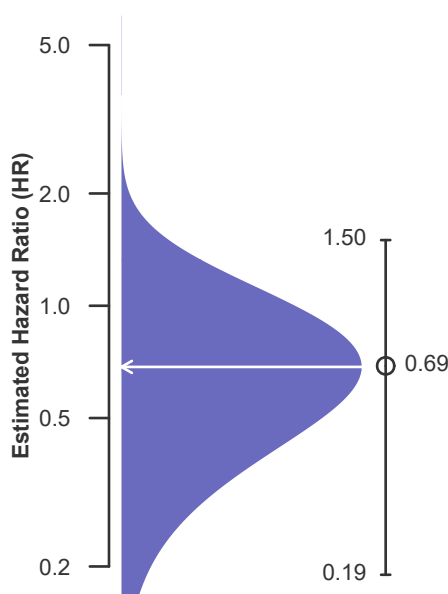
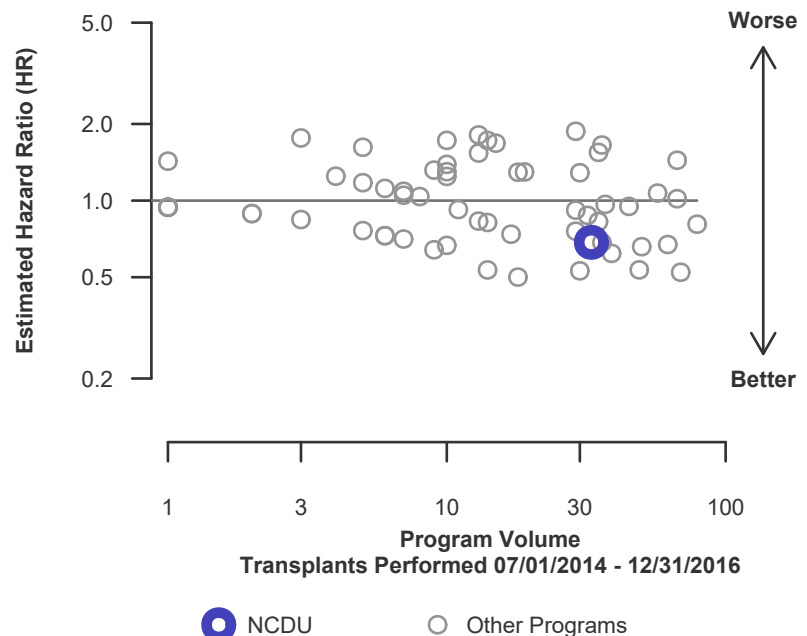


Figure C12. Pediatric (<18) 3-year graft failure HR program comparison





C. Transplant Information

Table C10D. Pediatric (<18) 3-year survival with a functioning deceased donor graft
Single organ transplants performed between 07/01/2014 and 12/31/2016
Deaths and retransplants are considered graft failures

	NCDU	U.S.
Number of transplants evaluated	31	1,142
Estimated probability of surviving with a functioning graft at 3 years (unadjusted for patient and donor characteristics)	93.55%	88.27%
Expected probability of surviving with a functioning graft at 3 years (adjusted for patient and donor characteristics)	88.28%	--
Number of observed graft failures (including deaths) during the first 3 years after transplant	2	134
Number of expected graft failures (including deaths) during the first 3 years after transplant	3.67	--
Estimated hazard ratio*	0.71	--
95% credible interval for the hazard ratio**	[0.19, 1.55]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.19, 1.55], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 29% lower risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 81% reduced risk up to 55% increased risk.

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

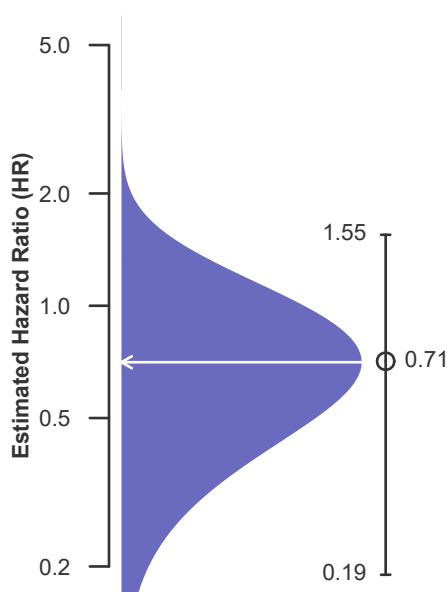
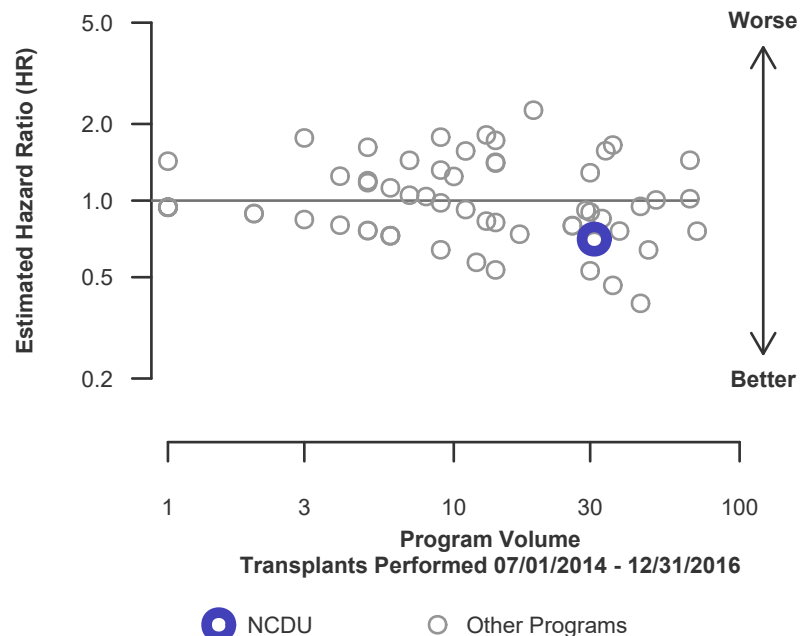


Figure C12D. Pediatric (<18) 3-year deceased donor graft failure HR program comparison





C. Transplant Information

Table C10L. Pediatric (<18) 3-year survival with a functioning living donor graft
Single organ transplants performed between 07/01/2014 and 12/31/2016
Deaths and retransplants are considered graft failures

	NCDU	U.S.
Number of transplants evaluated	2	162
Estimated probability of surviving with a functioning graft at 3 years (unadjusted for patient and donor characteristics)	100.00%	91.98%
Expected probability of surviving with a functioning graft at 3 years (adjusted for patient and donor characteristics)	92.00%	--
Number of observed graft failures (including deaths) during the first 3 years after transplant	0	13
Number of expected graft failures (including deaths) during the first 3 years after transplant	0.17	--
Estimated hazard ratio*	0.92	--
95% credible interval for the hazard ratio**	[0.11, 2.57]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.11, 2.57], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 8% lower risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 89% reduced risk up to 157% increased risk.

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

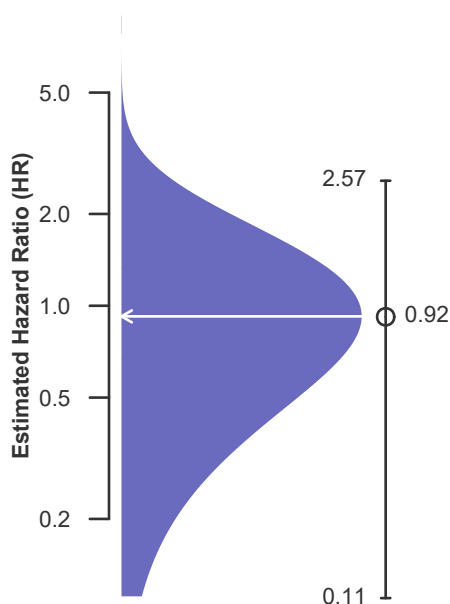
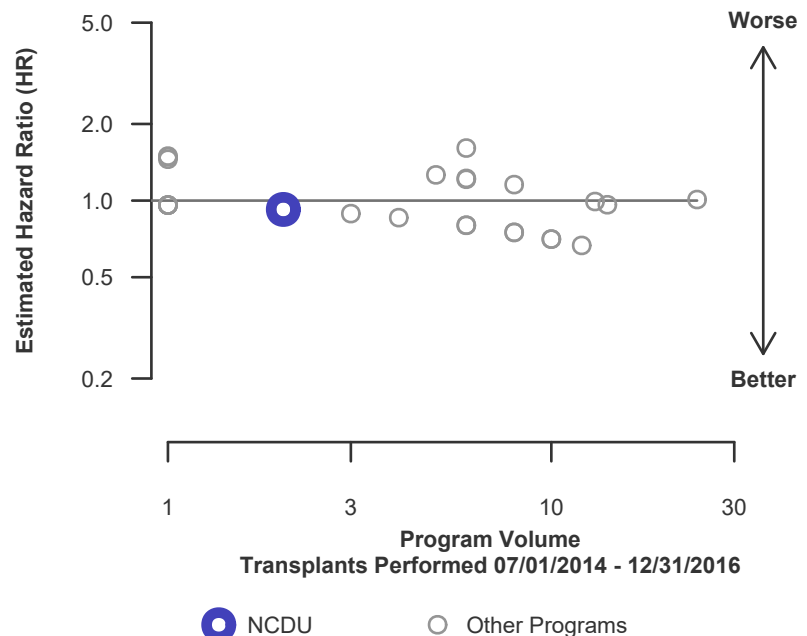


Figure C12L. Pediatric (<18) 3-year living donor graft failure HR program comparison





C. Transplant Information

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

Single organ transplants performed between 01/01/2017 and 06/30/2019
Retransplants excluded

	NCDU	U.S.
Number of transplants evaluated	190	16,732
Estimated probability of surviving at 1 month (unadjusted for patient and donor characteristics)	98.42%	97.85%
Expected probability of surviving at 1 month (adjusted for patient and donor characteristics)	98.00%	--
Number of observed deaths during the first month after transplant	3	360
Number of expected deaths during the first month after transplant	3.80	--
Estimated hazard ratio*	0.86	--
95% credible interval for the hazard ratio**	[0.28, 1.77]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.28, 1.77], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 14% lower risk of patient death compared to an average program, but NCDU's performance could plausibly range from 72% reduced risk up to 77% increased risk.

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

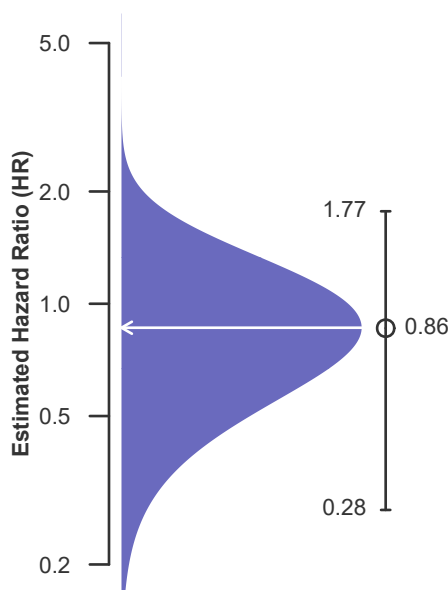
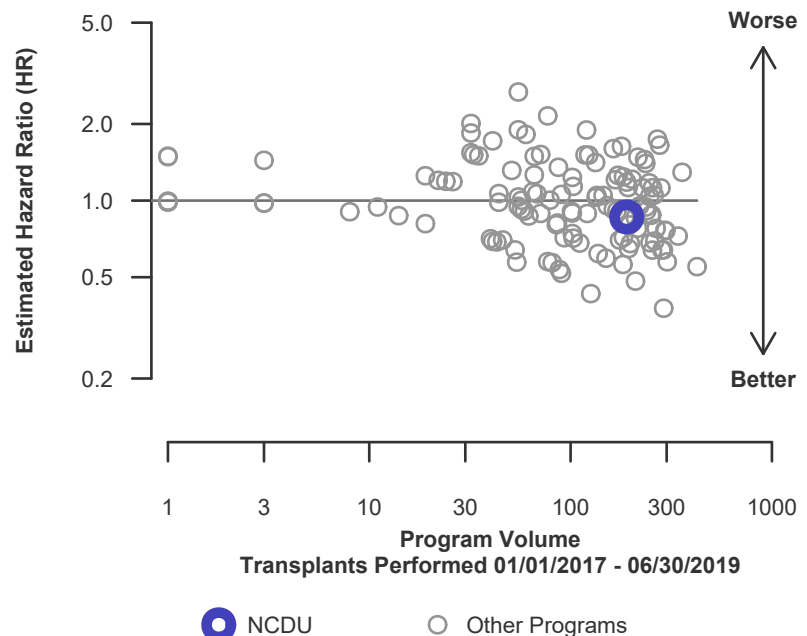


Figure C14. Adult (18+) 1-month patient death HR program comparison





C. Transplant Information

Table C11D. Adult (18+) 1-month patient survival (deceased donor graft recipients)
Single organ transplants performed between 01/01/2017 and 06/30/2019
Retransplants excluded

	NCDU	U.S.
Number of transplants evaluated	190	15,895
Estimated probability of surviving at 1 month (unadjusted for patient and donor characteristics)	98.42%	97.79%
Expected probability of surviving at 1 month (adjusted for patient and donor characteristics)	98.00%	--
Number of observed deaths during the first month after transplant	3	351
Number of expected deaths during the first month after transplant	3.80	--
Estimated hazard ratio*	0.86	--
95% credible interval for the hazard ratio**	[0.28, 1.77]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.28, 1.77], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 14% lower risk of patient death compared to an average program, but NCDU's performance could plausibly range from 72% reduced risk up to 77% increased risk.

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

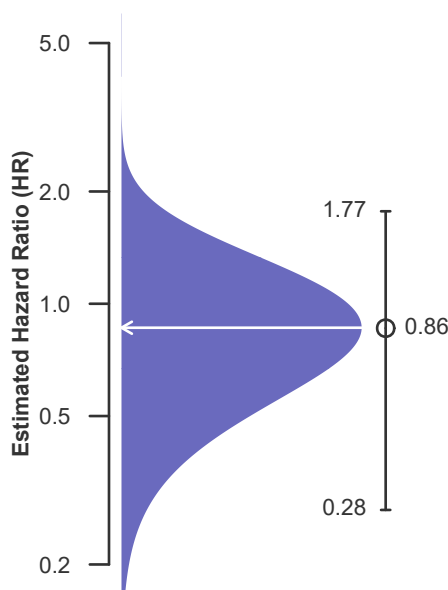
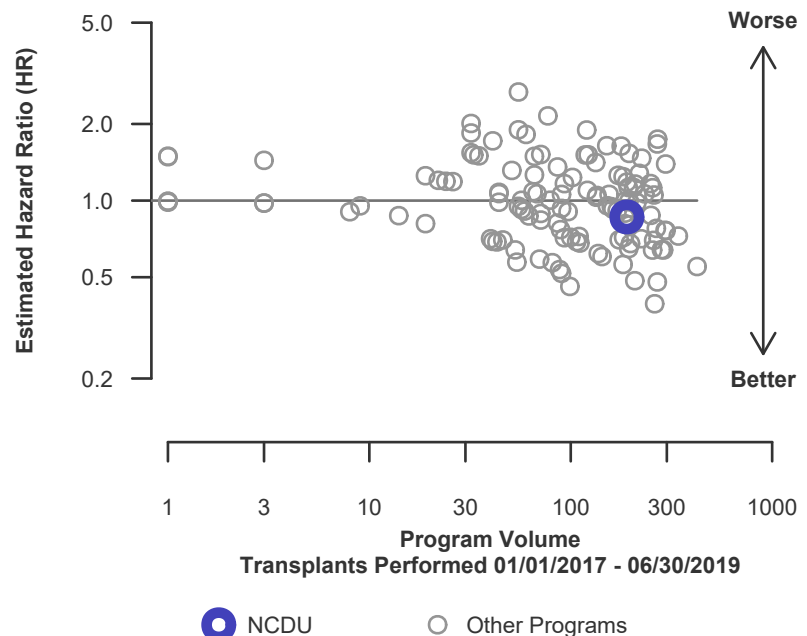


Figure C14D. Adult (18+) 1-month patient death HR program comparison (deceased donor grafts)





C. Transplant Information

Table C11L. Adult (18+) 1-month patient survival (living donor graft recipients)
Single organ transplants performed between 01/01/2017 and 06/30/2019
Retransplants excluded

This center did not perform any
transplants relevant to
this table during
01/01/2017-06/30/2019

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

This center did not perform any
transplants relevant to
this figure during
01/01/2017-06/30/2019

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

This center did not perform any
transplants relevant to
this figure during
01/01/2017-06/30/2019



C. Transplant Information

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

Single organ transplants performed between 01/01/2017 and 06/30/2019
Retransplants excluded

	NCDU	U.S.
Number of transplants evaluated	190	16,732
Estimated probability of surviving at 1 year (unadjusted for patient and donor characteristics)	94.62%	93.51%
Expected probability of surviving at 1 year (adjusted for patient and donor characteristics)	93.79%	--
Number of observed deaths during the first year after transplant	9	1,014
Number of expected deaths during the first year after transplant	10.98	--
Estimated hazard ratio*	0.85	--
95% credible interval for the hazard ratio**	[0.42, 1.42]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.42, 1.42], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 15% lower risk of patient death compared to an average program, but NCDU's performance could plausibly range from 58% reduced risk up to 42% increased risk.

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

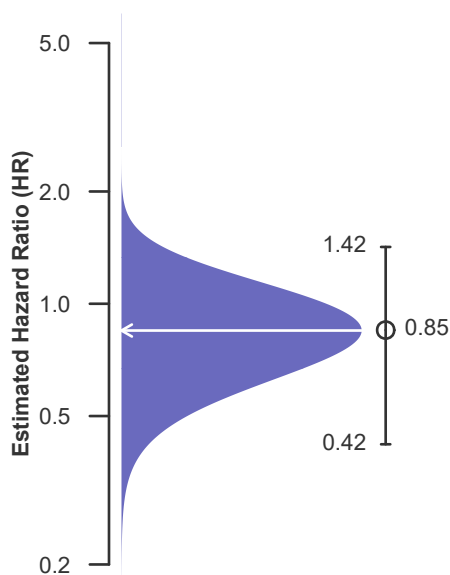
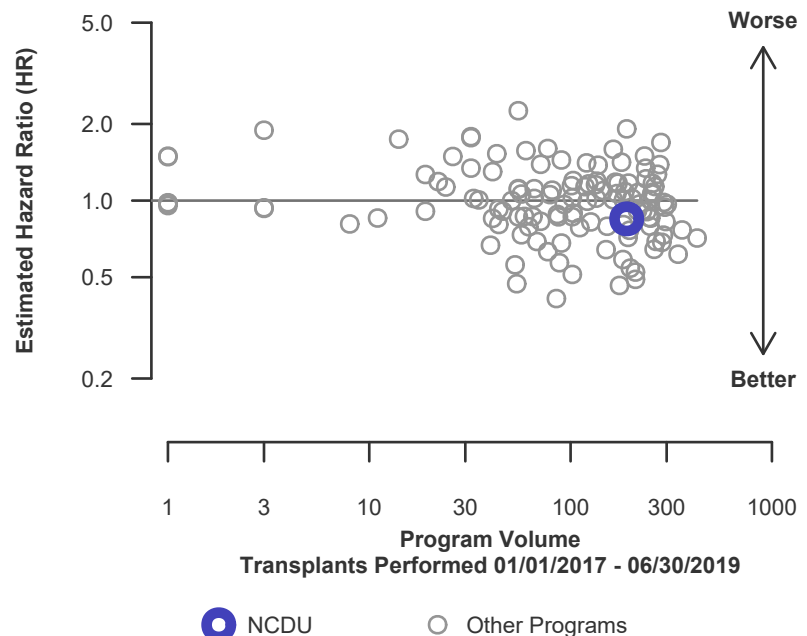


Figure C16. Adult (18+) 1-year patient death HR program comparison





C. Transplant Information

Table C12D. Adult (18+) 1-year patient survival (deceased donor graft recipients)
Single organ transplants performed between 01/01/2017 and 06/30/2019
Retransplants excluded

	NCDU	U.S.
Number of transplants evaluated	190	15,895
Estimated probability of surviving at 1 year (unadjusted for patient and donor characteristics)	94.62%	93.37%
Expected probability of surviving at 1 year (adjusted for patient and donor characteristics)	93.79%	--
Number of observed deaths during the first year after transplant	9	986
Number of expected deaths during the first year after transplant	10.98	--
Estimated hazard ratio*	0.85	--
95% credible interval for the hazard ratio**	[0.42, 1.42]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.42, 1.42], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 15% lower risk of patient death compared to an average program, but NCDU's performance could plausibly range from 58% reduced risk up to 42% increased risk.

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

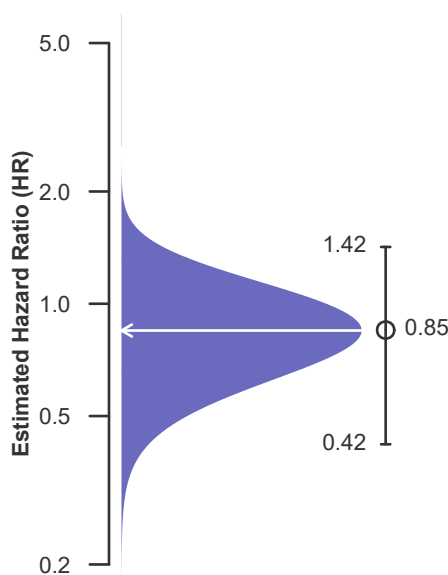
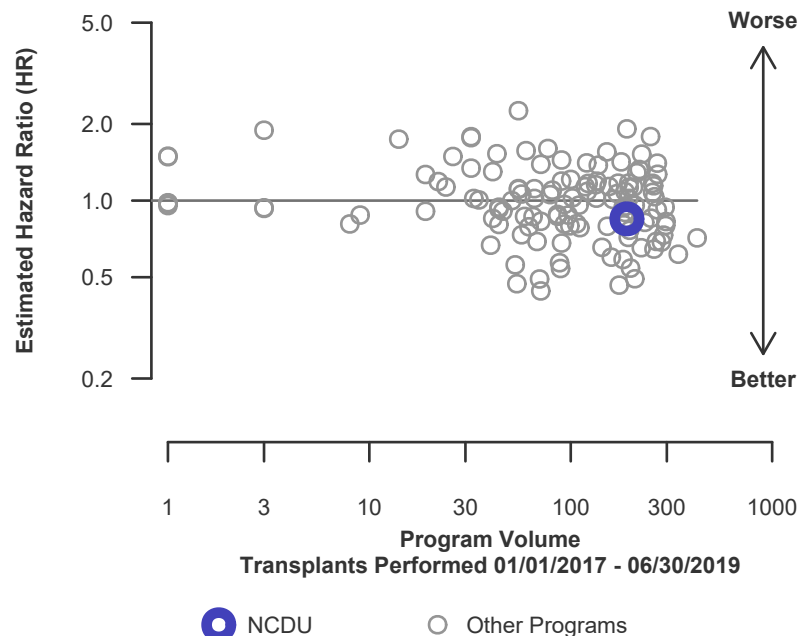


Figure C16D. Adult (18+) 1-year patient death HR program comparison (deceased donor grafts)





C. Transplant Information

Table C12L. Adult (18+) 1-year patient survival (living donor graft recipients)
Single organ transplants performed between 01/01/2017 and 06/30/2019
Retransplants excluded

This center did not perform any
transplants relevant to
this table during
01/01/2017-06/30/2019

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

This center did not perform any
transplants relevant to
this figure during
01/01/2017-06/30/2019

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

This center did not perform any
transplants relevant to
this figure during
01/01/2017-06/30/2019



C. Transplant Information

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

**Single organ transplants performed between 07/01/2014 and 12/31/2016
Retransplants excluded**

	NCDU	U.S.
Number of transplants evaluated	153	14,577
Estimated probability of surviving at 3 years (unadjusted for patient and donor characteristics)	91.50%	87.03%
Expected probability of surviving at 3 years (adjusted for patient and donor characteristics)	88.06%	--
Number of observed deaths during the first 3 years after transplant	13	1,890
Number of expected deaths during the first 3 years after transplant	18.88	--
Estimated hazard ratio*	0.72	--
95% credible interval for the hazard ratio**	[0.40, 1.13]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.40, 1.13], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 28% lower risk of patient death compared to an average program, but NCDU's performance could plausibly range from 60% reduced risk up to 13% increased risk.

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

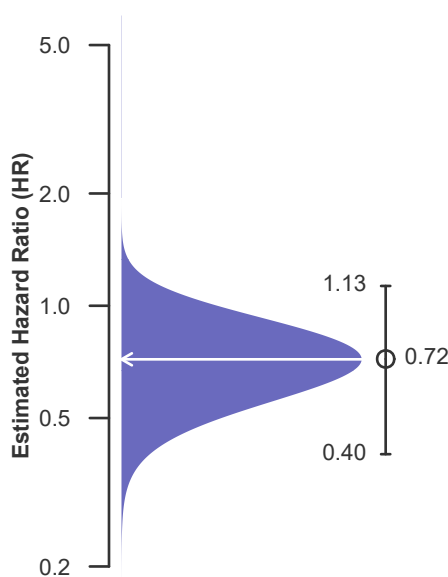
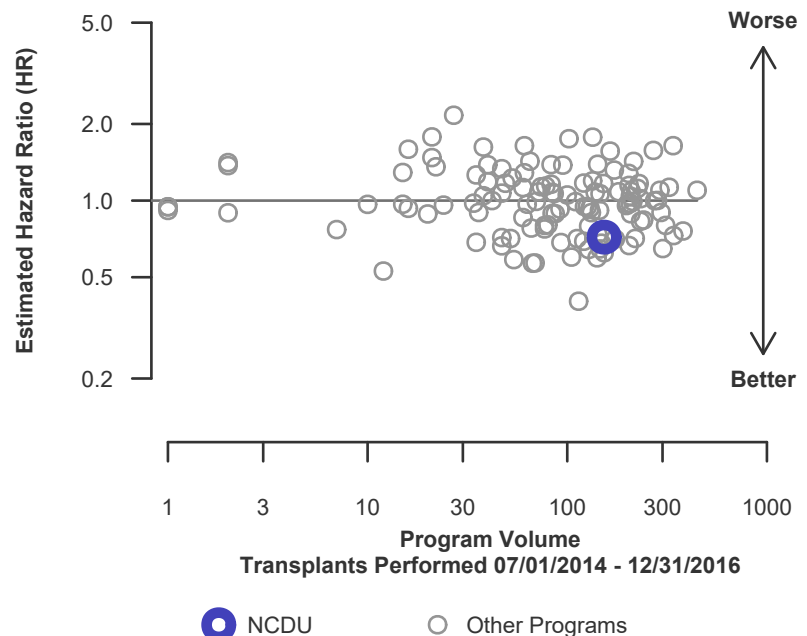


Figure C18. Adult (18+) 3-year patient death HR program comparison





C. Transplant Information

Table C13D. Adult (18+) 3-year patient survival (deceased donor graft recipients)
Single organ transplants performed between 07/01/2014 and 12/31/2016
Retransplants excluded

	NCDU	U.S.
Number of transplants evaluated	148	13,895
Estimated probability of surviving at 3 years (unadjusted for patient and donor characteristics)	91.89%	86.94%
Expected probability of surviving at 3 years (adjusted for patient and donor characteristics)	88.03%	--
Number of observed deaths during the first 3 years after transplant	12	1,815
Number of expected deaths during the first 3 years after transplant	18.38	--
Estimated hazard ratio*	0.69	--
95% credible interval for the hazard ratio**	[0.38, 1.09]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.38, 1.09], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 31% lower risk of patient death compared to an average program, but NCDU's performance could plausibly range from 62% reduced risk up to 9% increased risk.

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

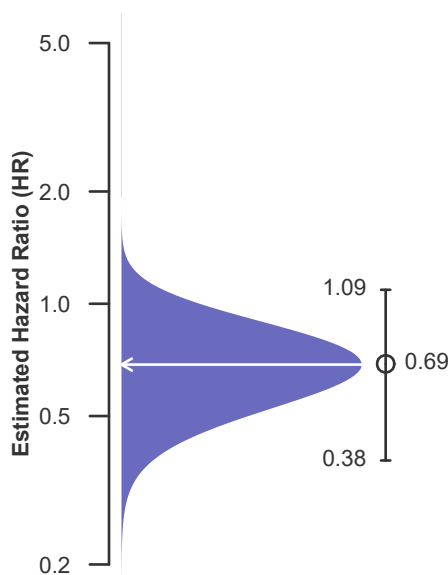
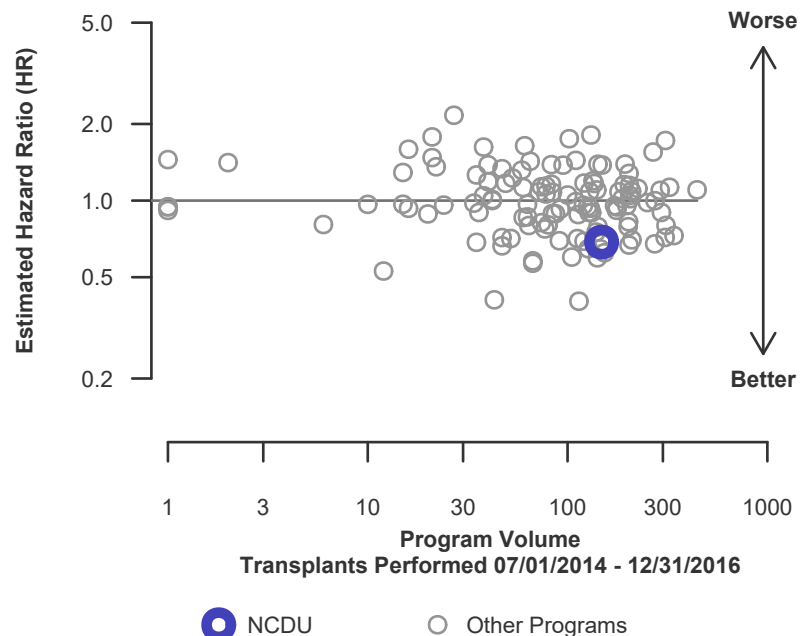


Figure C18D. Adult (18+) 3-year patient death HR program comparison (deceased donor grafts)





C. Transplant Information

Table C13L. Adult (18+) 3-year patient survival (living donor graft recipients)
Single organ transplants performed between 07/01/2014 and 12/31/2016
Retransplants excluded

	NCDU	U.S.
Number of transplants evaluated	5	682
Estimated probability of surviving at 3 years (unadjusted for patient and donor characteristics)	80.00%	89.00%
Expected probability of surviving at 3 years (adjusted for patient and donor characteristics)	89.01%	--
Number of observed deaths during the first 3 years after transplant	1	75
Number of expected deaths during the first 3 years after transplant	0.50	--
Estimated hazard ratio*	1.20	--
95% credible interval for the hazard ratio**	[0.25, 2.89]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.25, 2.89], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 20% higher risk of patient death compared to an average program, but NCDU's performance could plausibly range from 75% reduced risk up to 189% increased risk.

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

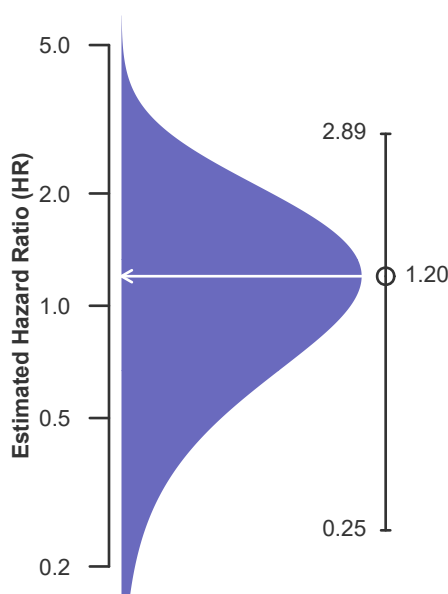
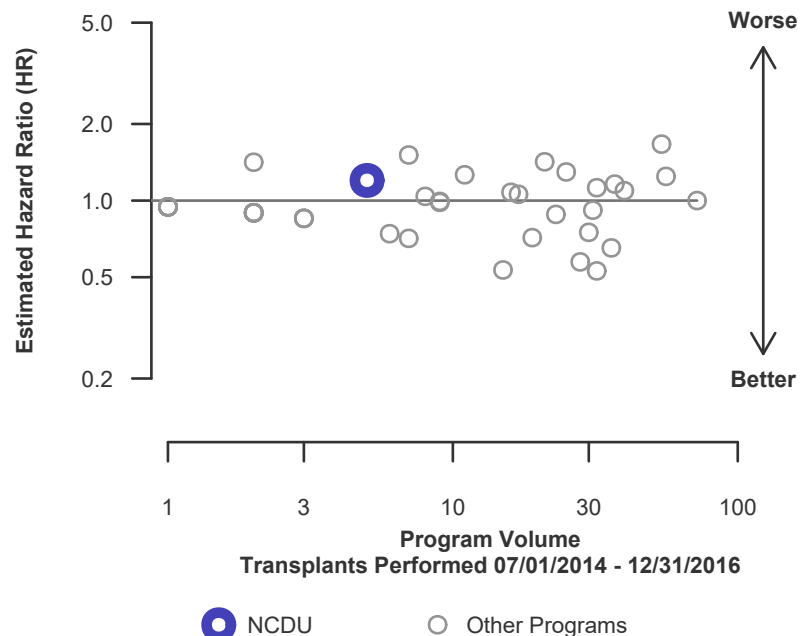


Figure C18L. Adult (18+) 3-year patient death HR program comparison (living donor grafts)





C. Transplant Information

Table C14. Pediatric (<18) 1-month patient survival
Single organ transplants performed between 01/01/2017 and 06/30/2019
Retransplants excluded

	NCDU	U.S.
Number of transplants evaluated	33	1,267
Estimated probability of surviving at 1 month (unadjusted for patient and donor characteristics)	100.00%	97.87%
Expected probability of surviving at 1 month (adjusted for patient and donor characteristics)	97.86%	--
Number of observed deaths during the first month after transplant	0	27
Number of expected deaths during the first month after transplant	0.72	--
Estimated hazard ratio*	0.74	--
95% credible interval for the hazard ratio**	[0.09, 2.05]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.09, 2.05], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 26% lower risk of patient death compared to an average program, but NCDU's performance could plausibly range from 91% reduced risk up to 105% increased risk.

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

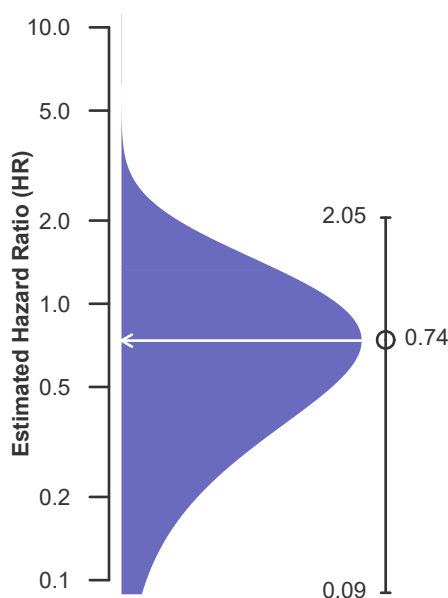
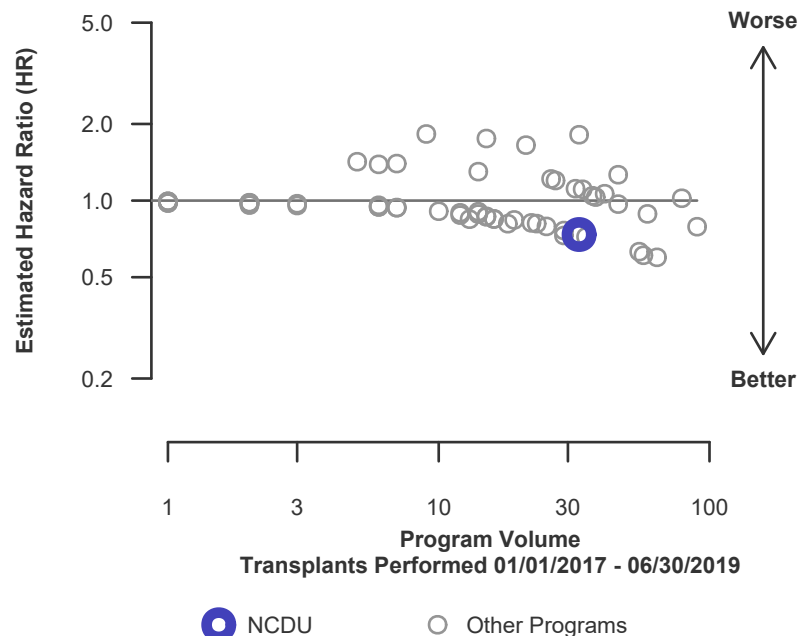


Figure C20. Pediatric (<18) 1-month patient death HR program comparison





C. Transplant Information

**Table C14D. Pediatric (<18) 1-month patient survival (deceased donor graft recipients)
Single organ transplants performed between 01/01/2017 and 06/30/2019
Retransplants excluded**

	NCDU	U.S.
Number of transplants evaluated	32	1,099
Estimated probability of surviving at 1 month (unadjusted for patient and donor characteristics)	100.00%	97.91%
Expected probability of surviving at 1 month (adjusted for patient and donor characteristics)	97.87%	--
Number of observed deaths during the first month after transplant	0	23
Number of expected deaths during the first month after transplant	0.69	--
Estimated hazard ratio*	0.74	--
95% credible interval for the hazard ratio**	[0.09, 2.07]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.09, 2.07], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 26% lower risk of patient death compared to an average program, but NCDU's performance could plausibly range from 91% reduced risk up to 107% increased risk.

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

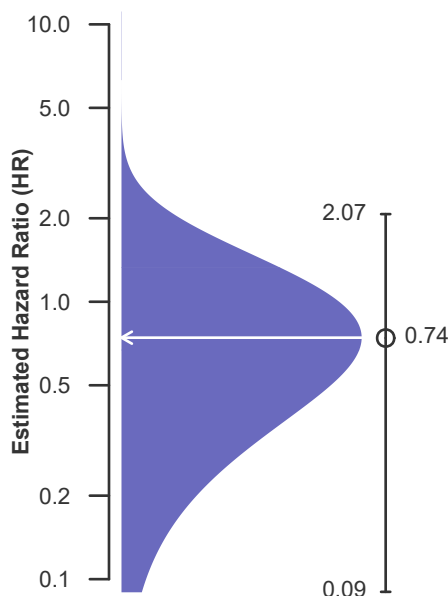
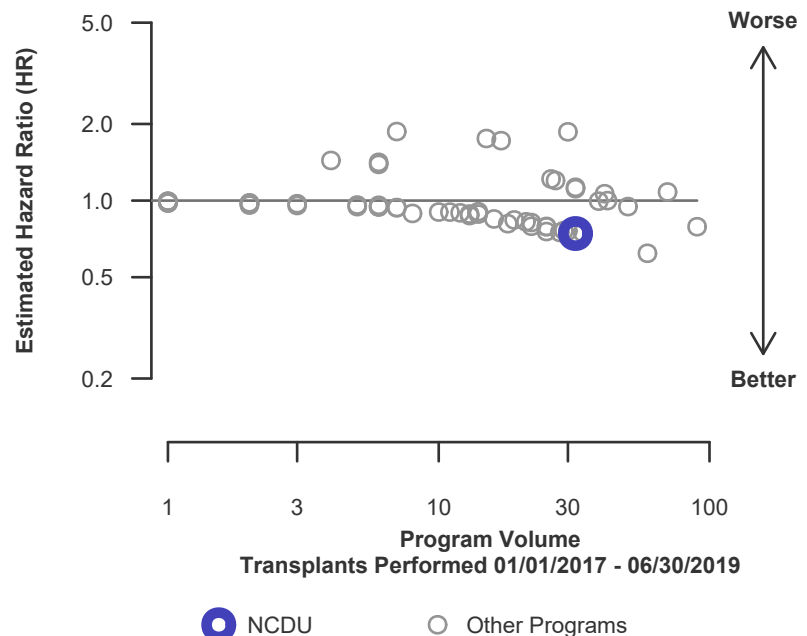


Figure C20D. Pediatric (<18) 1-month patient death HR program comparison (deceased donor grafts)





C. Transplant Information

Table C14L. Pediatric (<18) 1-month patient survival (living donor graft recipients)
Single organ transplants performed between 01/01/2017 and 06/30/2019
Retransplants excluded

	NCDU	U.S.
Number of transplants evaluated	1	168
Estimated probability of surviving at 1 month (unadjusted for patient and donor characteristics)	100.00%	97.62%
Expected probability of surviving at 1 month (adjusted for patient and donor characteristics)	97.63%	--
Number of observed deaths during the first month after transplant	0	4
Number of expected deaths during the first month after transplant	0.02	--
Estimated hazard ratio*	0.99	--
95% credible interval for the hazard ratio**	[0.12, 2.75]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.12, 2.75], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 1% lower risk of patient death compared to an average program, but NCDU's performance could plausibly range from 88% reduced risk up to 175% increased risk.

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

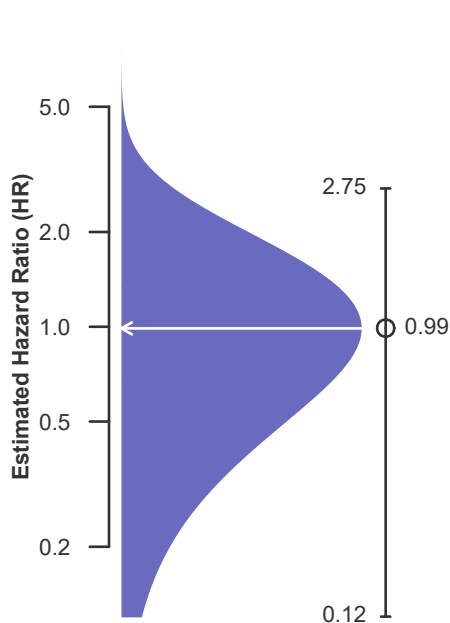
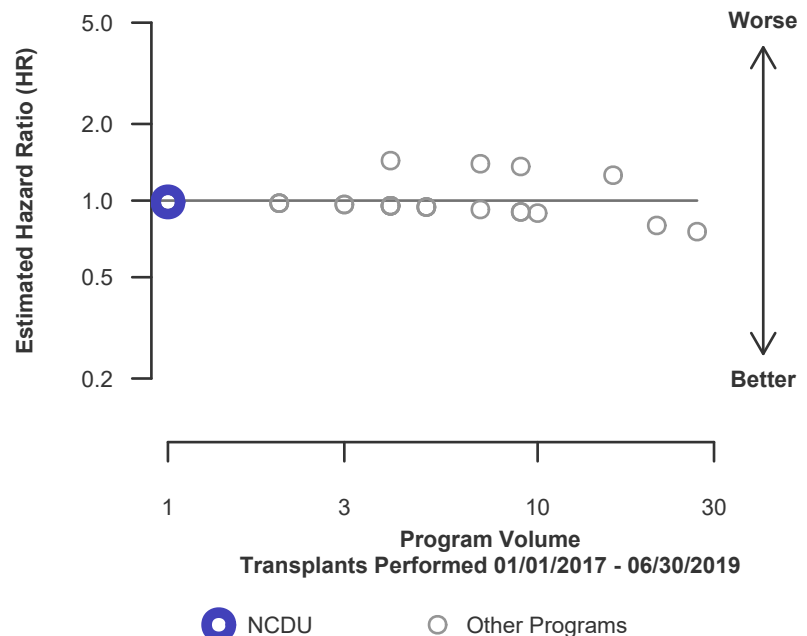


Figure C20L. Pediatric (<18) 1-month patient death HR program comparison (living donor grafts)





C. Transplant Information

Table C15. Pediatric (<18) 1-year patient survival
Single organ transplants performed between 01/01/2017 and 06/30/2019
Retransplants excluded

	NCDU	U.S.
Number of transplants evaluated	33	1,267
Estimated probability of surviving at 1 year (unadjusted for patient and donor characteristics)	100.00%	95.86%
Expected probability of surviving at 1 year (adjusted for patient and donor characteristics)	95.25%	--
Number of observed deaths during the first year after transplant	0	52
Number of expected deaths during the first year after transplant	1.61	--
Estimated hazard ratio*	0.55	--
95% credible interval for the hazard ratio**	[0.07, 1.55]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.07, 1.55], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 45% lower risk of patient death compared to an average program, but NCDU's performance could plausibly range from 93% reduced risk up to 55% increased risk.

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

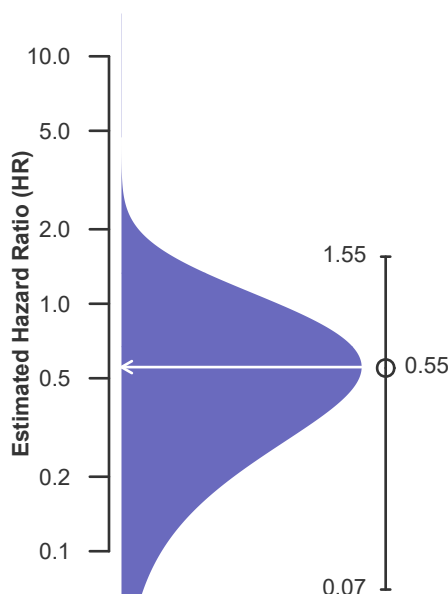
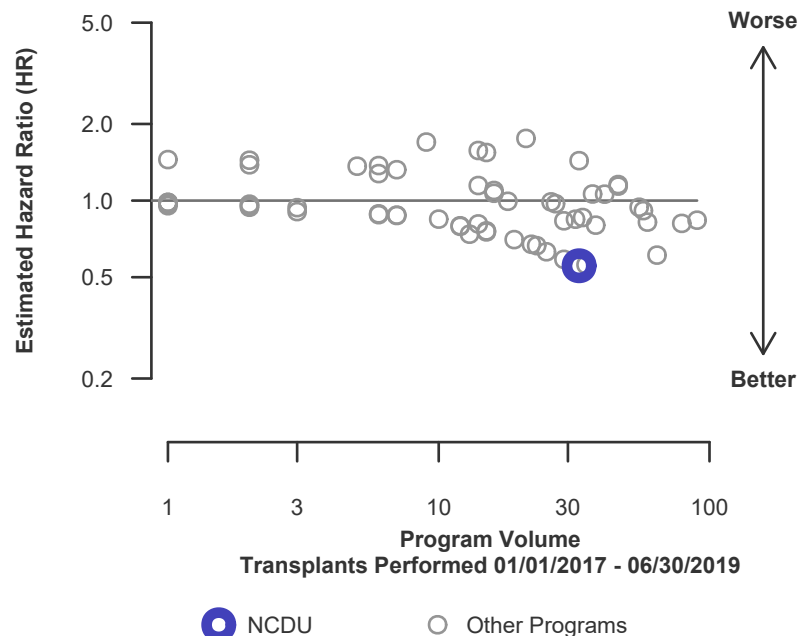


Figure C22. Pediatric (<18) 1-year patient death HR program comparison





C. Transplant Information

Table C15D. Pediatric (<18) 1-year patient survival (deceased donor graft recipients)
Single organ transplants performed between 01/01/2017 and 06/30/2019
Retransplants excluded

	NCDU	U.S.
Number of transplants evaluated	32	1,099
Estimated probability of surviving at 1 year (unadjusted for patient and donor characteristics)	100.00%	95.77%
Expected probability of surviving at 1 year (adjusted for patient and donor characteristics)	95.22%	--
Number of observed deaths during the first year after transplant	0	46
Number of expected deaths during the first year after transplant	1.57	--
Estimated hazard ratio*	0.56	--
95% credible interval for the hazard ratio**	[0.07, 1.56]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.07, 1.56], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 44% lower risk of patient death compared to an average program, but NCDU's performance could plausibly range from 93% reduced risk up to 56% increased risk.

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

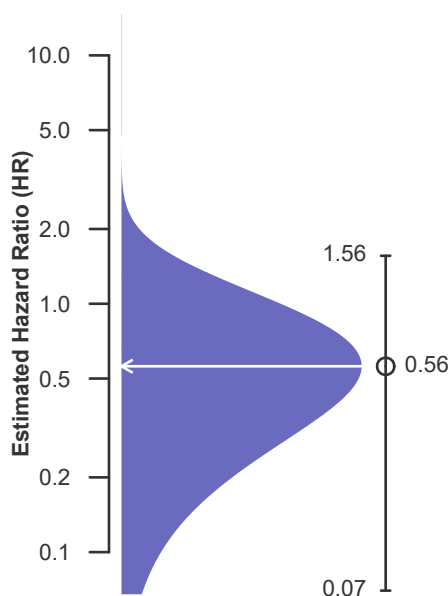
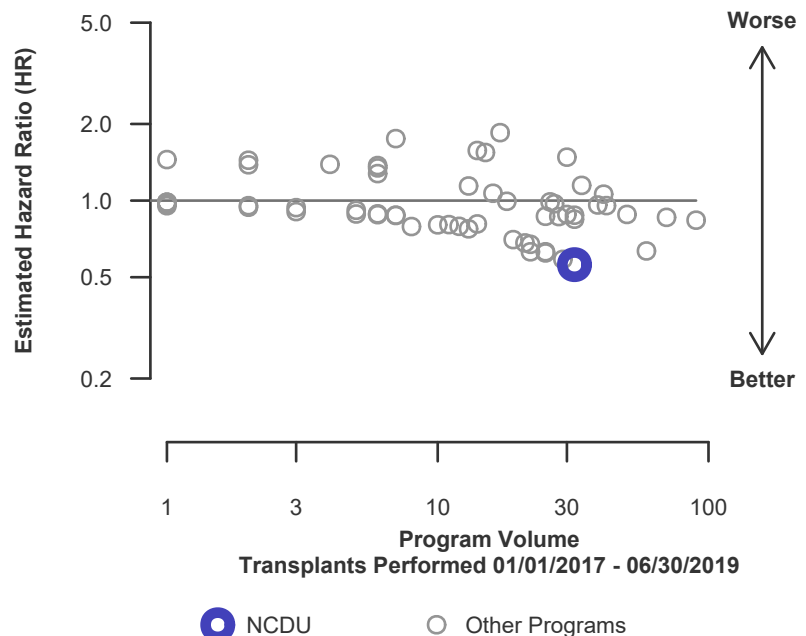


Figure C22D. Pediatric (<18) 1-year patient death HR program comparison (deceased donor grafts)





C. Transplant Information

Table C15L. Pediatric (<18) 1-year patient survival (living donor graft recipients)
Single organ transplants performed between 01/01/2017 and 06/30/2019
Retransplants excluded

	NCDU	U.S.
Number of transplants evaluated	1	168
Estimated probability of surviving at 1 year (unadjusted for patient and donor characteristics)	100.00%	96.43%
Expected probability of surviving at 1 year (adjusted for patient and donor characteristics)	96.44%	--
Number of observed deaths during the first year after transplant	0	6
Number of expected deaths during the first year after transplant	0.04	--
Estimated hazard ratio*	0.98	--
95% credible interval for the hazard ratio**	[0.12, 2.74]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.12, 2.74], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 2% lower risk of patient death compared to an average program, but NCDU's performance could plausibly range from 88% reduced risk up to 174% increased risk.

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

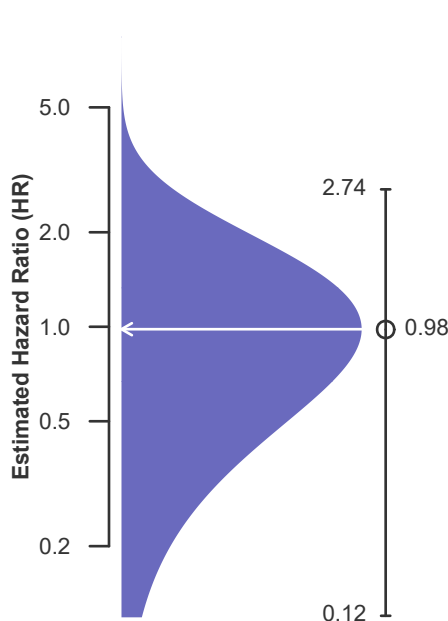
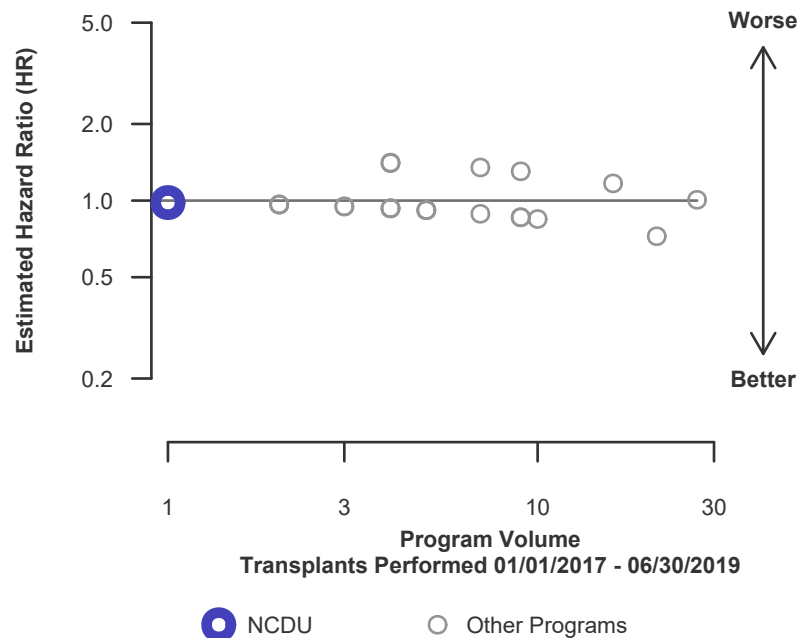


Figure C22L. Pediatric (<18) 1-year patient death HR program comparison (living donor grafts)





C. Transplant Information

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

**Single organ transplants performed between 07/01/2014 and 12/31/2016
Retransplants excluded**

	NCDU	U.S.
Number of transplants evaluated	29	1,206
Estimated probability of surviving at 3 years (unadjusted for patient and donor characteristics)	96.55%	93.45%
Expected probability of surviving at 3 years (adjusted for patient and donor characteristics)	93.33%	--
Number of observed deaths during the first 3 years after transplant	1	79
Number of expected deaths during the first 3 years after transplant	1.95	--
Estimated hazard ratio*	0.76	--
95% credible interval for the hazard ratio**	[0.16, 1.83]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.16, 1.83], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 24% lower risk of patient death compared to an average program, but NCDU's performance could plausibly range from 84% reduced risk up to 83% increased risk.

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

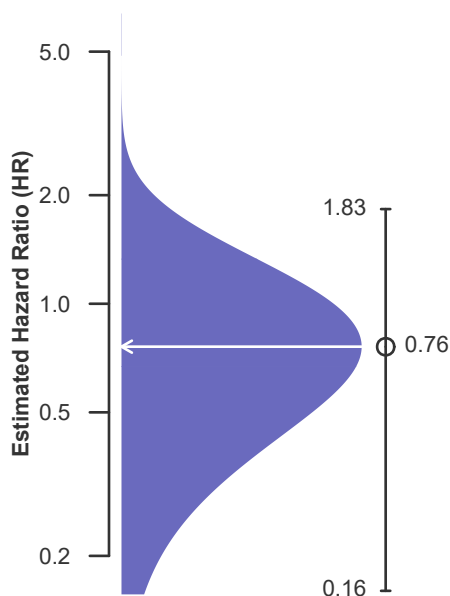
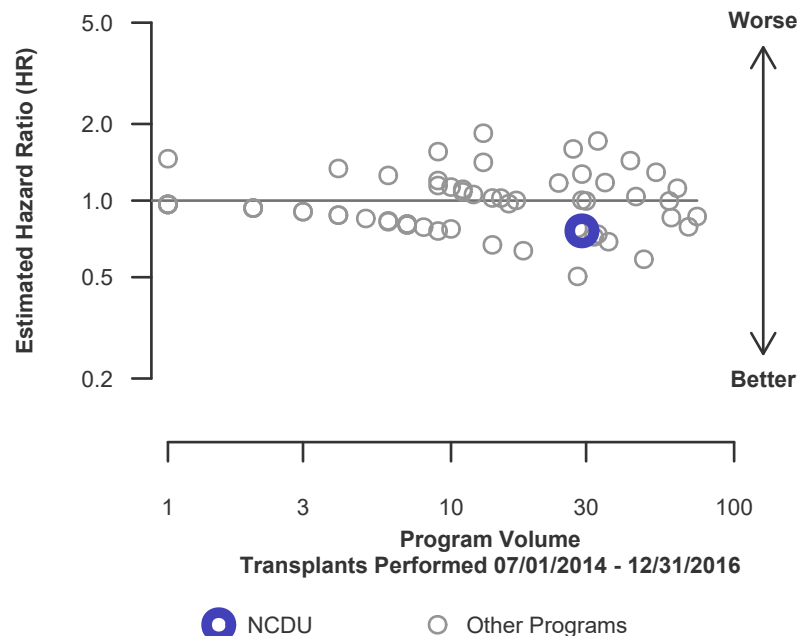


Figure C24. Pediatric (<18) 3-year patient death HR program comparison





C. Transplant Information

Table C16D. Pediatric (<18) 3-year patient survival (deceased donor graft recipients)
Single organ transplants performed between 07/01/2014 and 12/31/2016
Retransplants excluded

	NCDU	U.S.
Number of transplants evaluated	27	1,044
Estimated probability of surviving at 3 years (unadjusted for patient and donor characteristics)	96.30%	93.20%
Expected probability of surviving at 3 years (adjusted for patient and donor characteristics)	93.20%	--
Number of observed deaths during the first 3 years after transplant	1	71
Number of expected deaths during the first 3 years after transplant	1.84	--
Estimated hazard ratio*	0.78	--
95% credible interval for the hazard ratio**	[0.16, 1.88]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.16, 1.88], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 22% lower risk of patient death compared to an average program, but NCDU's performance could plausibly range from 84% reduced risk up to 88% increased risk.

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

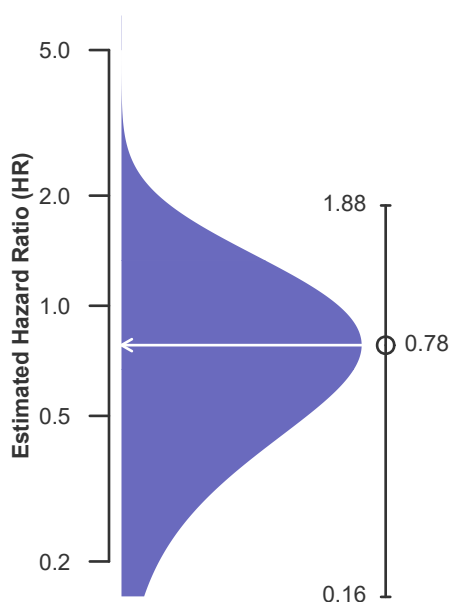
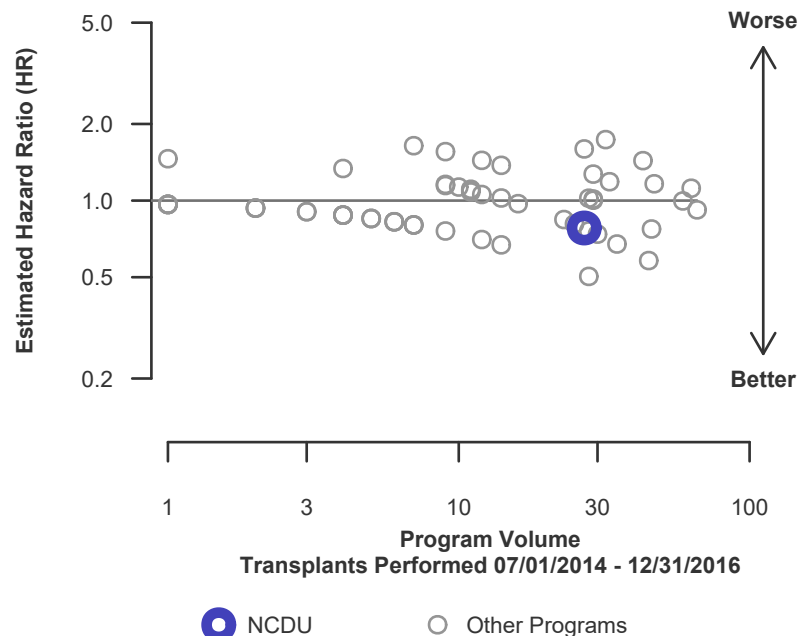


Figure C24D. Pediatric (<18) 3-year patient death HR program comparison (deceased donor grafts)





C. Transplant Information

Table C16L. Pediatric (<18) 3-year patient survival (living donor graft recipients)
Single organ transplants performed between 07/01/2014 and 12/31/2016
Retransplants excluded

	NCDU	U.S.
Number of transplants evaluated	2	162
Estimated probability of surviving at 3 years (unadjusted for patient and donor characteristics)	100.00%	95.06%
Expected probability of surviving at 3 years (adjusted for patient and donor characteristics)	95.08%	--
Number of observed deaths during the first 3 years after transplant	0	8
Number of expected deaths during the first 3 years after transplant	0.10	--
Estimated hazard ratio*	0.95	--
95% credible interval for the hazard ratio**	[0.12, 2.65]	--

* The hazard ratio provides an estimate of how Duke University Hospital (NCDU)'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 NCDU's patient death rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.12, 2.65], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 5% lower risk of patient death compared to an average program, but NCDU's performance could plausibly range from 88% reduced risk up to 165% increased risk.

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

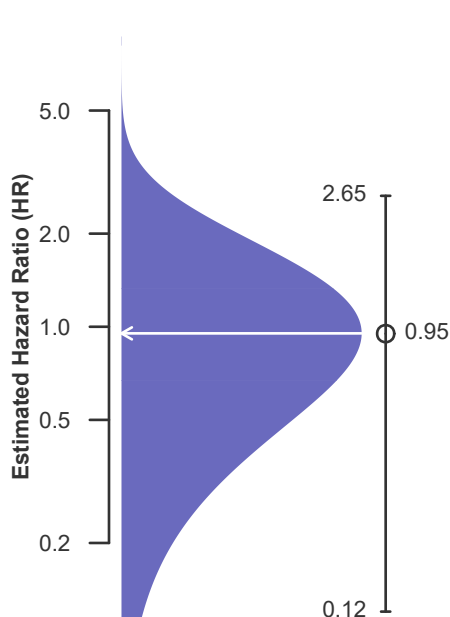
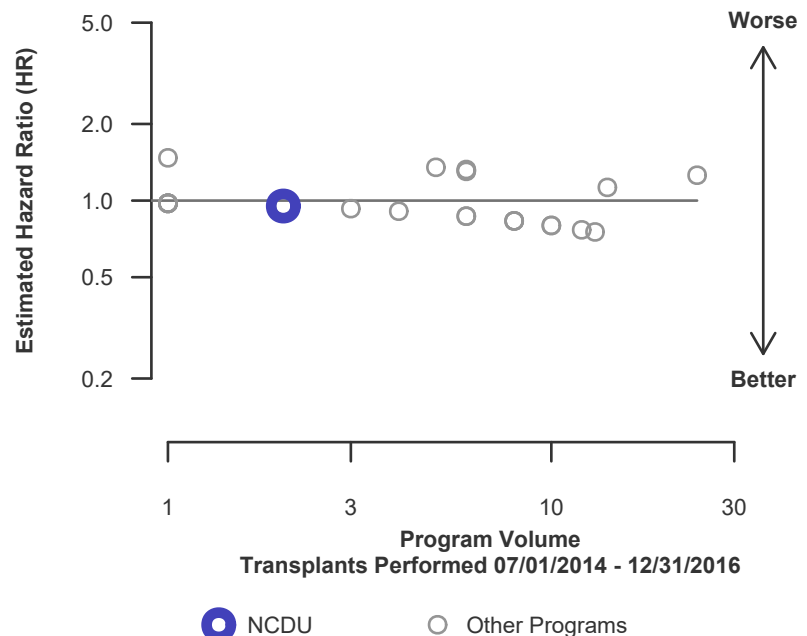


Figure C24L. Pediatric (<18) 3-year patient death HR program comparison (living donor grafts)





C. Transplant Information

Table C17. Multi-organ transplant graft survival: 01/01/2017 - 06/30/2019

Adult (18+) Transplants

Transplant Type	First-Year Outcomes					
	Transplants Performed		Liver Graft Failures		Estimated Liver Graft Survival	
	NCDU-TX1	USA	NCDU-TX1	USA	NCDU-TX1	USA
Kidney-Liver	23	1,697	2	173	91.3%	89.3%
Kidney-Pancreas-Liver-Intestine	1	8	0	5	100.0%	33.3%
Liver-Heart	2	93	0	8	100.0%	90.6%
Liver-Lung	3	28	0	4	100.0%	85.7%
Pancreas-Liver-Intestine	3	57	1	27	50.0%	51.5%

Pediatric (<18) Transplants

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

Table C18. Multi-organ transplant patient survival: 01/01/2017 - 06/30/2019

Adult (18+) Transplants

Transplant Type	First-Year Outcomes					
	Transplants Performed		Patient Deaths		Estimated Patient Survival	
	NCDU-TX1	USA	NCDU-TX1	USA	NCDU-TX1	USA
Kidney-Liver	23	1,697	2	160	91.3%	90.1%
Kidney-Pancreas-Liver-Intestine	1	8	0	5	100.0%	31.2%
Liver-Heart	2	93	0	8	100.0%	90.6%
Liver-Lung	3	28	0	4	100.0%	85.7%
Pancreas-Liver-Intestine	3	57	1	24	50.0%	56.8%

Pediatric (<18) Transplants

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



D. Living Donor Information

Table D1. Living donor summary: 01/01/2017 - 12/31/2019

Living Donor Follow-Up	This Center			United States		
	01/2017-12/2017	01/2018-12/2018	01/2019-06/2019	01/2017-12/2017	01/2018-12/2018	01/2019-06/2019
Number of Living Donors	1	0	0	359	392	246
6-Month Follow-Up						
Donors due for follow-up	1	0	0	359	392	246
Timely clinical data	1 100.0%	0 --%	0 --%	306 85.2%	347 88.5%	214 87.0%
Timely lab data	1 100.0%	0 --%	0 --%	293 81.6%	344 87.8%	216 87.8%
12-Month Follow-Up						
Donors due for follow-up	1	0		359	392	
Timely clinical data	1 100.0%	0 --%		293 81.6%	324 82.7%	
Timely lab data	1 100.0%	0 --%		281 78.3%	316 80.6%	
24-Month Follow-Up						
Donors due for follow-up	1			358		
Timely clinical data	1 100.0%			249 69.6%		
Timely lab data	1 100.0%			223 62.3%		

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