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## COVID-19 Guide

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### Adjustments to Transplant Program and OPO Evaluation Metrics

The Scientific Registry of Transplant Recipients (SRTR), under contract from the Health Resources and Services Administration (HRSA), is charged with evaluating the performance of the nation's transplant system through publication of semi-annual transplant program-specific reports (PSRs) and organ procurement organization (OPO)-specific reports (OSRs). These reports contain performance metrics covering various time periods. For OPOs, these metrics include eligible death conversion rates and deceased donor organ yield. For transplant programs, they include pre-transplant mortality rates (formerly called waitlist mortality rates), transplant rates, organ offer acceptance rates, patient mortality after listing, and 1-month, 1-year, and 3-year posttransplant outcomes including graft survival and patient survival.

In response to the current global pandemic, SRTR modified the evaluation metrics for transplant programs and OPOs for the reports released in January 2021 and July 2021. These reports made adjustments to transplant program and OPO performance metrics so that data beyond the declaration of a national public health emergency on March 13, 2020, were not included in the metrics.

Modifications for the January 2022 reporting cycle were considered at the Analytic Methods Subcommittee of the SRTR Review Committee (SRC) at its meeting on March 24, 2021, and the full SRC meeting on April 27, 2021. Both the Analytic Methods Subcommittee and the full SRC recommended an ongoing carve out of the first quarter of the pandemic (March 13, 2020 through June 12, 2020) from adjusted performance metrics, as detailed below. These recommendations were reviewed by HRSA's Division of Transplantation, which oversees SRTR. HRSA approved these recommendations, which SRTR will implement for the January 2022 reporting cycle. These changes will remain in force beyond the January 2022 reporting cycle, unless otherwise amended:

Posttransplant Outcomes (including 1-month, 1-year, and 3-year graft and patient survival): Evaluation cohorts will exclude transplants performed between March 13, 2020 and June 12, 2020, inclusive of March 13 and June 12. Patients given transplants before March 13, 2020 will have follow-up censored on March 12, 2020. Patients given transplants after June 12, 2020 will resume normal follow-up. Follow-up will not resume for patients given transplants before March 13, 2020 who are alive with function on June 12, 2020; however, this may be reconsidered as SRTR continues to explore moving to a period-prevalent methodology:

1-month & 1-year Patient and Graft Survival Evaluations: Transplants 7/1/2018-3/12/2020, follow-up through 3/12/2020. Transplants 6/13/2020-12/31/2020, follow-up through 6/30/2021.

3-year Patient and Graft Survival Evaluations: Transplants 1/1/2016-6/30/2018; follow-up through 3/12/2020.

Pre-Transplant Mortality Rate (formerly called Waitlist Mortality Rate): Evaluation cohorts will exclude March 13, 2020 through June 12, 2020, inclusive of March 13 and June 12:

Days after listing (and before transplant) between 7/1/2019-3/12/2020 and 6/13/2020-6/30/2021.



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Transplant Rate: Evaluation cohorts will exclude March 13, 2020 through June 12, 2020, inclusive of March 13 and June 12:

Candidates on the waitlist 7/1/2019-3/12/2020 and 6/13/2020-6/30/2021.

Overall Rate of Mortality After Listing: Evaluation cohorts will exclude March 13, 2020 through June 12, 2020, inclusive of March 13 and June 12:

Evaluation period: 7/1/2019-3/12/2020 and 6/13/2020-6/30/2021.

Offer Acceptance Rate: These evaluations are based on normal reporting cohorts.

Offers received 7/1/2020-6/30/2021.

These decisions will apply to the evaluations released in the SRTR's semi-annual program-specific reports scheduled for release on January 6, 2022. These changes have been communicated to the leadership of the Organ Procurement and Transplantation Network's (OPTN) Membership and Professional Standards Committee (MSPC). These decisions will then be re-evaluated as more information becomes available in preparation for the release scheduled for July 2022.

As with the July 2021 reports, SRTR will continue to report descriptive data beyond March 12, 2020, e.g., waitlist counts, transplant counts, recipient characteristics, donor counts, donor characteristics, etc., but will alter data for performance evaluation metrics as described above.



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## User Guide

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This report contains a wide range of useful information about the kidney transplant program at Duke University Hospital. 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 34.6 per 100 person-years. Transplant rates are also provided for adult and pediatric patients separately along with comparisons to adult and pediatric rates in the DSA, the OPTN region, and the nation. Transplant rates are also presented excluding transplants from a living donor (Table B4D and Figures B1D-B3D). Please refer to the PSR Technical Methods documentation available at <http://www.srtr.org> for more detail regarding how expected rates are calculated.

The pre-transplant mortality rate (previously called the waiting list 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 pre-transplant 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 07/01/2015 and 12/31/2020. The time it took for 5% (the 5th percentile) of patients to receive a transplant at this program was 0.9 months. If "Not Observed" is displayed in the table, then too few candidates received transplants before 06/30/2021 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 - B14 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](mailto:srtr@srtr.org).



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## A. Program Summary

Figure A1. Waiting list and transplant activity

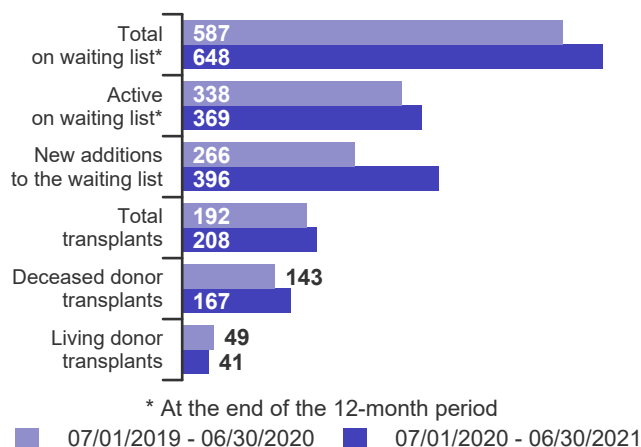


Table A1. Census of transplant recipients

Recipients	07/01/2019-06/30/2020	07/01/2020-06/30/2021
Transplanted at this center	192	208
Followed by this center*	829	941
...transplanted at this program	810	920
...transplanted elsewhere	19	21

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

Figure A2. Transplant rates  
07/01/2019 - 03/12/2020, 06/13/2020 - 06/30/2021

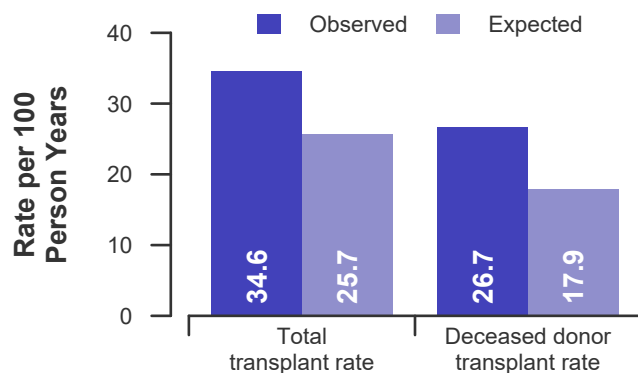


Figure A3. Pre-transplant mortality rates  
07/01/2019 - 03/12/2020, 06/13/2020 - 06/30/2021

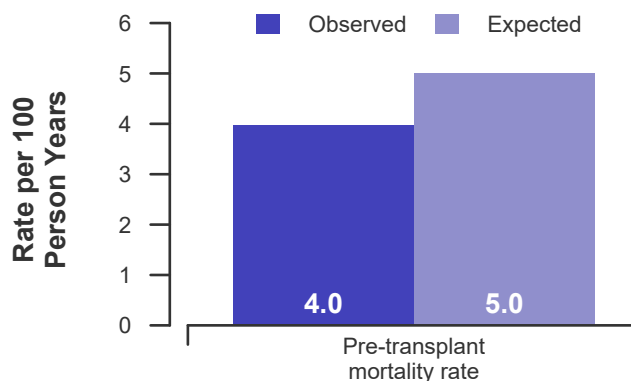


Figure A4. First-year adult graft and patient survival:  
07/01/2018 - 03/12/2020, 06/13/2020 - 12/31/2020

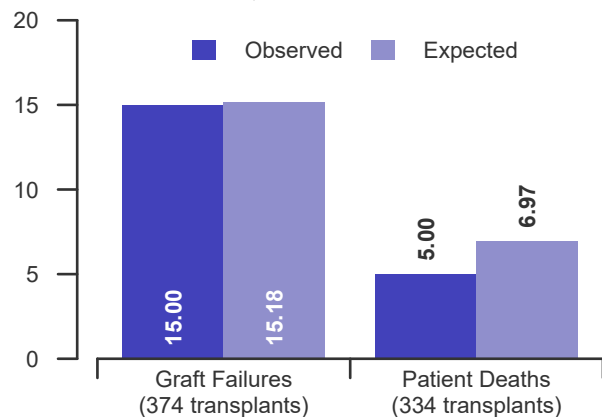
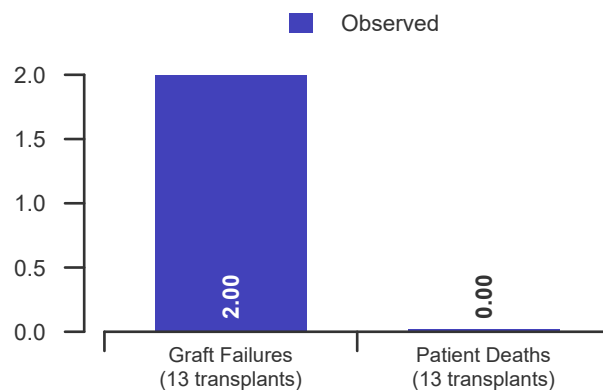


Figure A5. First-year pediatric graft & patient survival:  
07/01/2018 - 03/12/2020, 06/13/2020 - 12/31/2020







## B. Waiting List Information

Table B1. Waiting list activity summary: 07/01/2019 - 06/30/2021

Waiting List Registrations	Counts for this center		Activity for 07/01/2020 to 06/30/2021 as percent of registrants on waiting list on 07/01/2020		
	07/01/2019-06/30/2020	07/01/2020-06/30/2021	This Center (%)	OPTN Region (%)	U.S. (%)
<b>On waiting list at start</b>	642	587	100.0	100.0	100.0
<b>Additions</b>					
New listings at this center	266	396	67.5	55.0	40.4
<b>Removals</b>					
Transferred to another center	8	3	0.5	0.5	1.0
Received living donor transplant*	48	40	6.8	5.6	5.9
Received deceased donor transplant*	143	167	28.4	24.3	18.9
Died	13	18	3.1	4.8	5.2
Transplanted at another center	21	35	6.0	5.2	4.0
Deteriorated	41	27	4.6	4.5	3.8
Recovered	1	4	0.7	0.2	0.2
Other reasons	46	41	7.0	3.9	4.2
<b>On waiting list at end of period</b>	587	648	110.4	106.1	97.1

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





## B. Waiting List Information

**Table B2. Demographic characteristics of waiting list candidates****Candidates registered on the waiting list between 07/01/2020 and 06/30/2021**

Demographic Characteristic	New Waiting List Registrations 07/01/2020 to 06/30/2021 (%)			All Waiting List Registrations on 06/30/2021 (%)		
	This Center (N=396)	OPTN Region (N=4,986)	U.S. (N=40,025)	This Center (N=648)	OPTN Region (N=9,624)	U.S. (N=96,313)
<b>All (%)</b>	100.0	100.0	100.0	100.0	100.0	100.0
<b>Ethnicity/Race (%)*</b>						
White	38.6	42.5	42.7	36.6	39.9	35.5
African-American	54.3	49.9	29.1	56.8	52.3	31.9
Hispanic/Latino	2.3	3.5	18.4	2.3	3.3	20.8
Asian	2.8	2.5	8.0	2.8	2.6	10.0
Other	2.0	1.5	1.8	1.5	1.8	1.8
Unknown	0.0	0.0	0.0	0.0	0.0	0.0
<b>Age (%)</b>						
<2 years	0.0	0.2	0.2	0.2	0.1	0.1
2-11 years	0.8	0.8	1.0	0.6	0.6	0.6
12-17 years	1.8	1.0	1.6	1.1	0.9	1.1
18-34 years	12.1	9.6	10.6	11.0	9.7	10.2
35-49 years	26.5	25.9	25.3	29.5	28.2	27.0
50-64 years	44.7	42.2	40.7	45.1	42.6	43.2
65-69 years	12.4	12.9	12.7	11.6	12.6	12.1
70+ years	1.8	7.4	7.8	1.1	5.4	5.8
<b>Gender (%)</b>						
Male	64.4	61.5	62.4	66.5	61.5	62.0
Female	35.6	38.5	37.6	33.5	38.5	38.0

\* 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%.



## B. Waiting List Information

**Table B3. Medical characteristics of waiting list candidates**

Candidates registered on the waiting list between 07/01/2020 and 06/30/2021

Medical Characteristic	New Waiting List Registrations 07/01/2020 to 06/30/2021 (%)			All Waiting List Registrations on 06/30/2021 (%)		
	This Center (N=396)	OPTN Region (N=4,986)	U.S. (N=40,025)	This Center (N=648)	OPTN Region (N=9,624)	U.S. (N=96,313)
<b>All (%)</b>	100.0	100.0	100.0	100.0	100.0	100.0
<b>Blood Type (%)</b>						
O	49.5	50.1	49.2	54.5	54.4	54.0
A	29.5	31.3	32.2	23.8	26.2	27.0
B	17.9	15.3	14.8	19.8	17.3	16.5
AB	3.0	3.3	3.8	2.0	2.1	2.5
Unknown	0.0	0.0	0.0	0.0	0.0	0.0
<b>Previous Transplant (%)</b>						
Yes	18.4	12.2	13.1	20.2	14.7	13.8
No	81.6	87.8	86.9	79.8	85.3	86.2
Unknown	0.0	0.0	0.0	0.0	0.0	0.0
<b>Initial CPRA (%)</b>						
0-9%	83.6	76.8	79.0	81.8	77.2	79.7
10-79%	10.9	14.2	13.5	11.3	13.8	13.0
80+%	5.6	8.7	7.5	6.9	9.0	7.2
Unknown	0.0	0.3	0.0	0.0	0.1	0.1
<b>Primary Disease (%)*</b>						
Glomerular Diseases	19.9	17.1	19.0	20.2	17.8	18.8
Tubular and Interstitial Diseases	8.8	3.2	3.7	8.2	3.4	3.6
Polycystic Kidneys	7.8	6.1	7.0	6.6	6.7	6.8
Congenital, Familial, Metabolic	2.3	1.9	2.3	2.8	1.9	1.9
Diabetes	33.1	36.3	34.2	34.6	37.4	36.8
Renovascular & Vascular Diseases	0.3	0.1	0.1	0.3	0.1	0.1
Neoplasms	0.8	0.3	0.4	0.3	0.3	0.3
Hypertensive Nephrosclerosis	16.4	23.4	19.7	19.8	23.9	20.9
Other	10.6	11.5	13.2	7.1	8.3	10.3
Missing*	0.0	0.2	0.4	0.2	0.2	0.4

\* When "retransplant" is indicated, the primary disease is passed forward from the prior transplant in order to indicate the initial primary disease causing organ failure. "Missing" may include some patients for whom retransplant is indicated but no prior diagnosis can be found.



## B. Waiting List Information

Table B4. Transplant rates: 07/01/2019 - 03/12/2020, 06/13/2020 - 06/30/2021

Waiting List Registrations	This Center	OPO/DSA	Region	U.S.
<b>All Candidates</b>				
Count on waiting list at start*	641	2,389	8,991	100,351
Person Years**	1,074.8	4,277.2	16,274.5	172,961.9
Removals for Transplant	372	1,149	4,554	42,626
<b>Adult (18+) Candidates</b>				
Count on waiting list at start*	630	2,334	8,834	98,745
Person Years**	1,057.4	4,202.6	16,019.3	170,105.7
Removals for transplant	358	1,100	4,399	40,983
<b>Pediatric (&lt;18) Candidates</b>				
Count on waiting list at start*	11	55	157	1,606
Person Years**	17.5	74.7	255.2	2,856.1
Removals for transplant	14	49	155	1,643

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

\*\* Person years are calculated as days (converted to fractional years). The number of days from July 1 or from the date of first wait listing until death, transplant, removal from the waiting list or June 30. Person years excludes time on the waiting list between March 13, 2020 and June 12, 2020.

Figure B1. Observed and expected transplant rates: 07/01/2019 - 03/12/2020, 06/13/2020 - 06/30/2021

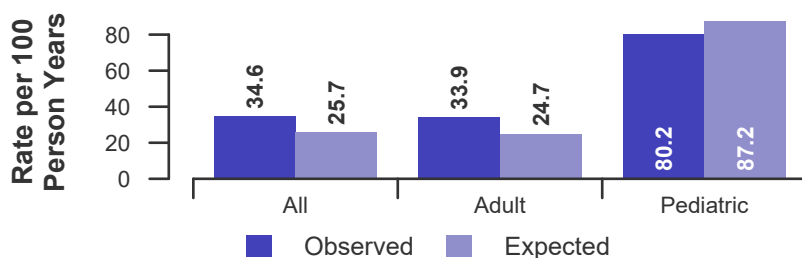


Figure B2. Transplant rate ratio estimate

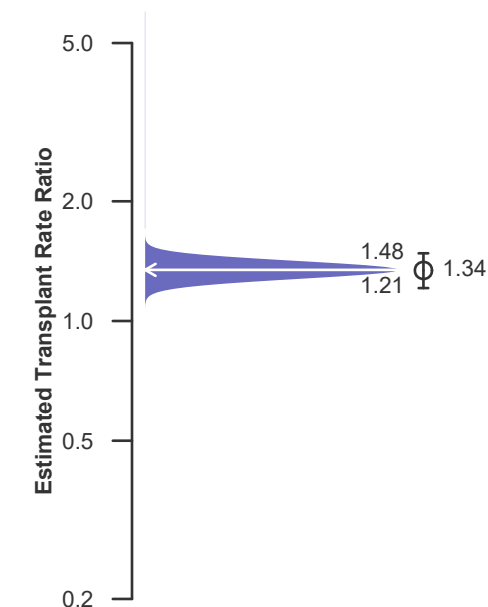
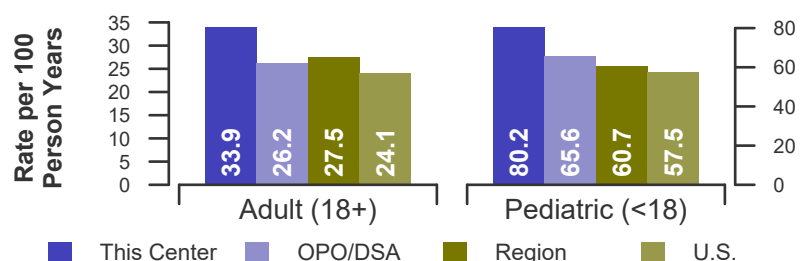


Figure B3. Observed adult (18+) and pediatric (<18) transplant rates: 07/01/2019 - 03/12/2020, 06/13/2020 - 06/30/2021





## B. Waiting List Information

Table B4D. Deceased donor transplant rates: 07/01/2019 - 03/12/2020, 06/13/2020 - 06/30/2021

Waiting List Registrations	This Center	OPO/DSA	Region	U.S.
<b>All Candidates</b>				
Count on waiting list at start*	641	2,389	8,991	100,351
Person Years**	1,074.8	4,277.2	16,274.5	172,961.9
Removals for Transplant	287	924	3,668	31,726
<b>Adult (18+) Candidates</b>				
Count on waiting list at start*	630	2,334	8,834	98,745
Person Years**	1,057.4	4,202.6	16,019.3	170,105.7
Removals for transplant	276	887	3,553	30,566
<b>Pediatric (&lt;18) Candidates</b>				
Count on waiting list at start*	11	55	157	1,606
Person Years**	17.5	74.7	255.2	2,856.1
Removals for transplant	11	37	115	1,160

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

\*\* Person years are calculated as days (converted to fractional years). The number of days from July 1 or from the date of first wait listing until death, transplant, removal from the waiting list or June 30. Person years excludes time on the waiting list between March 13, 2020 and June 12, 2020.

Figure B1D. Observed and expected deceased donor transplant rates: 07/01/2019 - 03/12/2020, 06/13/2020 - 06/30/2021

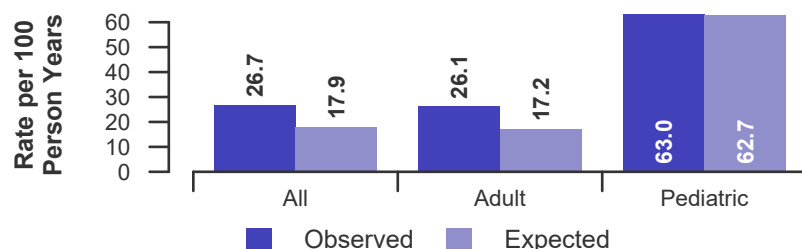


Figure B3D. Observed adult (18+) and pediatric (<18) deceased donor transplant rates: 07/01/2019 - 03/12/2020, 06/13/2020 - 06/30/2021

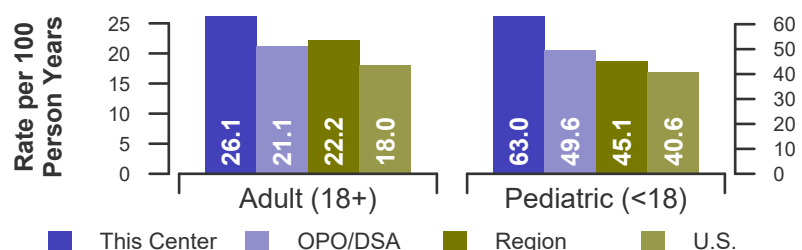
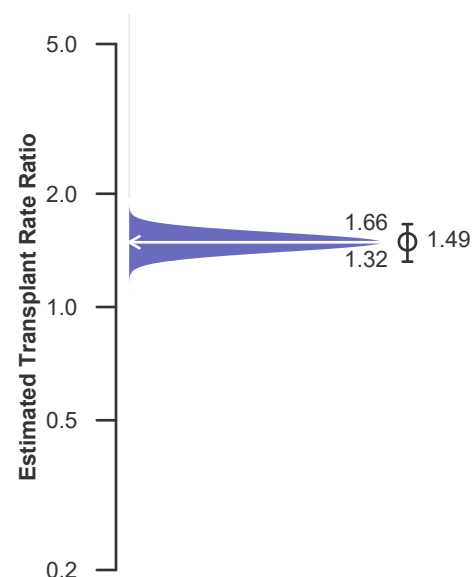


Figure B2D. Deceased donor transplant rate ratio estimate





## B. Waiting List Information

Table B5. Pre-transplant mortality rates: 07/01/2019 - 03/12/2020, 06/13/2020 - 06/30/2021

Waiting List Registrations	This Center	OPO/DSA	Region	U.S.
<b>All Candidates</b>				
Count on waiting list at start*	641	2,389	8,991	100,351
Person Years**	1,207.5	4,586.5	17,755.5	187,470.2
Number of deaths	48	221	970	10,519
<b>Adult (18+) Candidates</b>				
Count on waiting list at start*	630	2,334	8,834	98,745
Person Years**	1,190.0	4,510.5	17,492.9	184,524.0
Number of deaths	47	218	965	10,481
<b>Pediatric (&lt;18) Candidates</b>				
Count on waiting list at start*	11	55	157	1,606
Person Years**	17.5	76.0	262.6	2,946.2
Number of deaths	1	3	5	38

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

\*\* Person years are calculated as days (converted to fractional years). The number of days from July 1 or from the date of first wait listing until death, transplant, 60 days after recovery, transfer or June 30. Person years excludes time on the waiting list between March 13, 2020 and June 12, 2020.

Figure B4. Observed and expected pre-transplant mortality rates: 07/01/2019 - 03/12/2020, 06/13/2020 - 06/30/2021

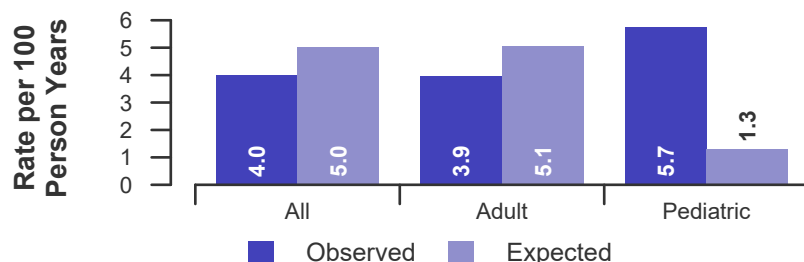


Figure B6. Observed adult (18+) and pediatric (<18) pre-transplant mortality rates: 07/01/2019 - 03/12/2020, 06/13/2020 - 06/30/2021

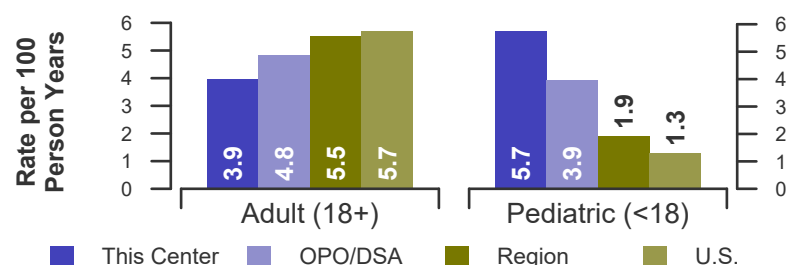
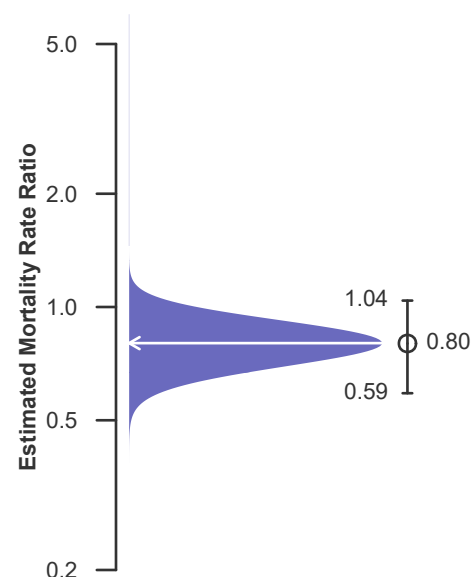


Figure B5. Pre-transplant mortality rate ratio estimate





## B. Waiting List Information

Table B6. Rates of patient mortality after listing: 07/01/2019 - 03/12/2020, 06/13/2020 - 06/30/2021

Waiting List Registrations	This Center	OPO/DSA	Region	U.S.
<b>All Patients</b>				
Count at risk during the evaluation period	2,281	7,519	30,139	302,724
Person-years*	3,042.0	10,042.1	39,237.1	398,472.8
Number of Deaths	123	447	1,960	19,860
<b>Adult (18+) Patients</b>				
Count at risk during the evaluation period	2,224	7,291	29,370	293,790
Person-years*	2,963.4	9,723.5	38,200.9	386,346.9
Number of Deaths	121	444	1,952	19,771
<b>Pediatric (&lt;18) Patients</b>				
Count at risk during the evaluation period	57	228	769	8,934
Person-years*	78.6	318.6	1,036.2	12,125.9
Number of Deaths	2	3	8	89

\* Person-years are calculated as days (converted to fractional years). The number of days from 07/01/2019, or from the date of first wait listing until death, reaching 7 years after listing or June 30, 2021. Person years excludes time on the waiting list between March 13, 2020 and June 12, 2020.

\*\* 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: 07/01/2019 - 03/12/2020, 06/13/2020 - 06/30/2021

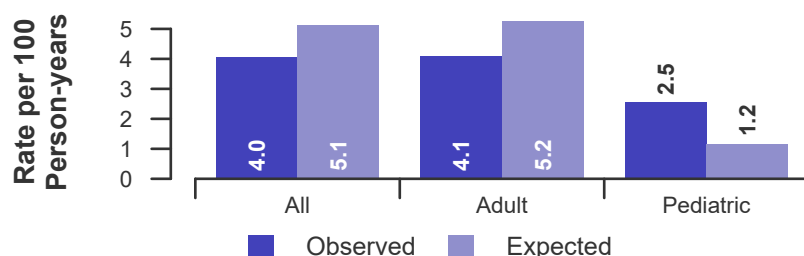


Figure B8. HR estimate of patient mortality after listing

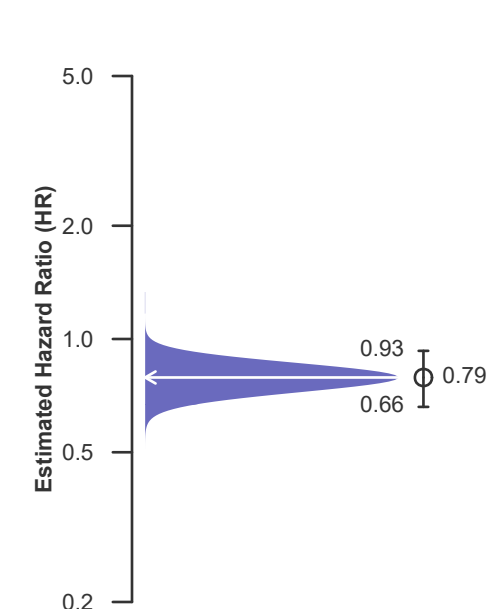
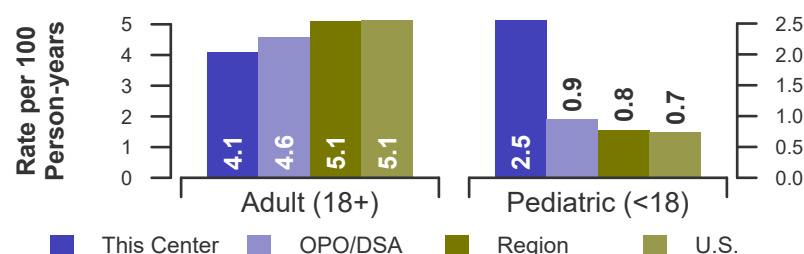


Figure B9. Observed adult (18+) and pediatric (<18) rates of patient mortality after listing: 07/01/2019 - 03/12/2020, 06/13/2020 - 06/30/2021





## B. Waiting List Information

**Table B7. Waiting list candidate status after listing**  
**Candidates registered on waiting list between 01/01/2019 and 12/31/2019**

Waiting list status (survival status)	This Center (N=310)			U.S. (N=42,666)		
	Months Since Listing			Months Since Listing		
	6	12	18	6	12	18
<b>Alive on waiting list (%)</b>	73.9	57.4	47.4	76.4	63.3	53.2
<b>Died on the waiting list without transplant (%)</b>	0.3	1.3	1.6	1.1	2.2	3.4
<b>Removed without transplant (%):</b>						
Condition worsened (status unknown)	1.0	1.6	2.3	0.7	1.5	2.4
Condition improved (status unknown)	0.0	0.3	0.3	0.1	0.2	0.2
Refused transplant (status unknown)	0.0	0.0	0.0	0.0	0.1	0.2
Other	0.6	3.2	5.5	0.7	1.4	2.3
<b>Transplant (living donor from waiting list only) (%):</b>						
Functioning (alive)	4.8	7.4	6.1	6.2	9.0	7.9
Failed-Retransplanted (alive)	0.0	0.0	0.0	0.0	0.0	0.0
Failed-alive not retransplanted	0.0	0.0	0.0	0.0	0.0	0.0
Died	0.0	0.3	0.3	0.0	0.1	0.2
Status Yet Unknown**	0.0	0.3	2.6	0.1	0.4	3.2
<b>Transplant (deceased donor) (%):</b>						
Functioning (alive)	15.8	20.6	19.4	12.3	16.5	14.7
Failed-Retransplanted (alive)	0.0	0.0	0.0	0.0	0.0	0.0
Failed-alive not retransplanted	0.3	0.0	0.0	0.1	0.1	0.1
Died	1.0	1.6	1.9	0.3	0.6	1.0
Status Yet Unknown*	1.9	5.5	12.3	1.8	3.9	10.2
<b>Lost or Transferred (status unknown) (%)</b>	0.3	0.3	0.3	0.4	0.9	1.2
<b>TOTAL (%)</b>	100.0	100.0	100.0	100.0	100.0	100.0
Total % known died on waiting list or after transplant	1.3	3.2	3.9	1.4	2.9	4.5
Total % known died or removed as unstable	2.3	4.8	6.1	2.0	4.4	6.9
Total % removed for transplant	23.9	35.8	42.6	20.7	30.6	37.1
Total % with known functioning transplant (alive)	20.6	28.1	25.5	18.4	25.4	22.5

\* 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 07/01/2015 and 06/30/2018

Characteristic	N	Percent transplanted at time periods since listing									
		This Center					United States				
		30 day	1 year	2 years	3 years		30 day	1 year	2 years	3 years	
<b>All</b>	720	6.0	20.4	28.5	36.5	94,364	4.2	17.9	24.8	30.4	
<b>Ethnicity/Race*</b>											
White	269	5.2	19.0	25.3	34.6	37,695	4.3	18.5	25.7	31.3	
African-American	405	6.9	22.0	30.6	38.3	29,111	4.4	18.4	25.4	30.9	
Hispanic/Latino	19	0.0	15.8	31.6	31.6	17,983	4.3	17.3	23.8	29.2	
Asian	18	0.0	16.7	33.3	38.9	7,843	2.4	12.7	19.4	25.4	
Other	9	11.1	11.1	11.1	22.2	1,732	5.3	21.9	29.4	34.8	
Unknown	0	--	--	--	--	0	--	--	--	--	
<b>Age</b>											
<2 years	0	--	--	--	--	131	4.6	37.4	55.7	71.8	
2-11 years	3	33.3	66.7	66.7	66.7	812	8.4	49.0	63.4	71.8	
12-17 years	5	20.0	40.0	60.0	60.0	1,369	7.6	50.2	62.4	67.5	
18-34 years	64	1.6	9.4	20.3	28.1	9,450	4.1	19.3	27.6	34.9	
35-49 years	216	4.6	22.2	31.5	38.4	23,643	3.8	17.1	24.4	30.4	
50-64 years	327	8.3	20.8	27.8	37.6	40,267	4.2	16.5	22.8	28.0	
65-69 years	98	3.1	21.4	28.6	34.7	12,623	4.1	16.7	23.0	28.0	
70+ years	7	0.0	0.0	0.0	0.0	6,069	4.1	18.0	24.1	28.8	
<b>Gender</b>											
Male	419	7.4	21.2	27.0	35.1	58,464	4.3	17.2	23.7	29.1	
Female	301	4.0	19.3	30.6	38.5	35,900	4.0	19.0	26.6	32.5	

\* 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%.



## B. Waiting List Information

**Table B9. Percent of candidates with deceased donor transplants: medical characteristics**  
Candidates registered on the waiting list between 07/01/2015 and 06/30/2018

Characteristic	Percent transplanted at time periods since listing									
		This Center				United States				
	N	30 day	1 year	2 years	3 years	N	30 day	1 year	2 years	3 years
All	720	6.0	20.4	28.5	36.5	94,364	4.2	17.9	24.8	30.4
Blood Type										
O	342	6.7	21.9	28.4	34.2	46,901	3.9	15.5	21.3	26.2
A	237	6.3	20.7	31.2	42.6	29,625	5.1	21.2	29.6	36.2
B	118	2.5	13.6	20.3	25.4	14,355	2.6	15.0	21.4	26.6
AB	23	8.7	30.4	43.5	65.2	3,483	6.7	33.1	44.8	52.0
Previous Transplant										
Yes	100	2.0	18.0	24.0	31.0	12,691	2.8	17.7	26.1	31.3
No	620	6.6	20.8	29.2	37.4	81,673	4.4	17.9	24.6	30.2
Peak PRA/CPRA										
0-9%	593	6.4	19.6	26.5	34.7	74,891	4.5	17.2	23.7	29.3
10-79%	74	2.7	12.2	23.0	35.1	11,491	3.1	17.0	24.3	30.2
80+%	53	5.7	41.5	58.5	58.5	7,873	3.1	25.2	35.7	40.8
Unknown	0	--	--	--	--	5	100.0	100.0	100.0	100.0
Primary Disease*										
Glomerular Diseases	139	2.9	18.0	30.9	43.2	17,451	3.4	18.7	27.2	34.1
Tubular & Interstitial Diseases	51	3.9	19.6	23.5	29.4	3,637	5.0	20.9	28.2	34.0
Polycystic Kidneys	49	0.0	16.3	22.4	26.5	6,366	2.8	17.0	25.4	32.6
Congenital, Familial, Metabolic	16	12.5	31.2	37.5	43.8	1,823	5.8	31.2	40.9	48.9
Diabetes	267	3.0	19.1	24.3	31.8	33,604	2.9	13.3	18.7	23.3
Renovascular & Vascular Diseases	1	0.0	0.0	0.0	0.0	163	6.7	23.9	31.3	36.8
Neoplasms	6	16.7	33.3	50.0	50.0	319	9.1	25.7	32.9	38.9
Hypertensive Nephrosclerosis	148	10.8	23.0	34.5	40.5	19,786	4.3	18.1	25.2	31.1
Other	41	24.4	29.3	31.7	46.3	10,873	9.2	27.1	34.6	39.1
Missing*	2	0.0	0.0	50.0	50.0	342	2.0	11.4	16.7	21.9

\* When "retransplant" is indicated, the primary disease is passed forward from the prior transplant in order to indicate the initial primary disease causing organ failure. "Missing" may include some patients for whom retransplant is indicated but no prior diagnosis can be found.



## B. Waiting List Information

**Table B10. Time to transplant for waiting list candidates\***

**Candidates registered on the waiting list between 07/01/2015 and 12/31/2020**

Percentile	Center	Months to Transplant**		U.S.
		OPO/DSA	Region	
5th	0.9	0.8	0.9	0.8
10th	2.2	2.0	2	2.2
25th	8.5	8.6	8.1	8.8
50th (median time to transplant)	31.8	35.1	32.5	37.4
75th	Not Observed	Not Observed	Not Observed	Not Observed

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

\*\* Censored on 06/30/2021. 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: 07/01/2020 - 06/30/2021

Offers Acceptance Characteristics	This Center	OPO/DSA	Region	U.S.
<b>Overall</b>				
Number of Offers	13,434	62,697	223,305	2,114,234
Number of Acceptances	151	526	2,097	17,556
Expected Acceptances	60.4	428.4	2,008.2	17,535.6
Offer Acceptance Ratio*	2.45	1.23	1.04	1.00
95% Credible Interval**	[2.08, 2.86]	--	--	--
<b>Low-KDRI Donors (KDRI &lt; 1.05)</b>				
Number of Offers	1,486	6,137	25,275	285,044
Number of Acceptances	35	160	669	5,635
Expected Acceptances	15.9	133.6	582.6	5,625.2
Offer Acceptance Ratio*	2.06	1.19	1.15	1.00
95% Credible Interval**	[1.45, 2.78]	--	--	--
<b>Medium-KDRI Donors (1.05 &lt; KDRI &lt; 1.75)</b>				
Number of Offers	8,295	40,987	146,798	1,288,424
Number of Acceptances	88	284	1,192	9,793
Expected Acceptances	33.0	231.3	1,183.5	9,785.9
Offer Acceptance Ratio*	2.57	1.23	1.01	1.00
95% Credible Interval**	[2.07, 3.13]	--	--	--
<b>High-KDRI Donors (KDRI &gt; 1.75)</b>				
Number of Offers	3,653	15,573	51,232	540,766
Number of Acceptances	28	82	236	2,128
Expected Acceptances	11.4	63.5	242.2	2,124.5
Offer Acceptance Ratio*	2.24	1.28	0.97	1.00
95% Credible Interval**	[1.51, 3.10]	--	--	--
<b>Hard-to-Place Kidneys (Over 100 Offers)</b>				
Number of Offers	12,302	54,557	182,248	1,783,615
Number of Acceptances	21	95	299	2,673
Expected Acceptances	17.1	74.9	282.2	2,669.7
Offer Acceptance Ratio*	1.20	1.26	1.06	1.00
95% Credible Interval**	[0.76, 1.74]	--	--	--

\* The offer acceptance ratio estimates the relative offer acceptance practice of Duke University Hospital 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, [2.08, 2.86], indicates the location of NCDU's true offer acceptance ratio with 95% probability. The best estimate is 145% more likely to accept an offer compared to national acceptance behavior, but NCDU's performance could plausibly range from 108% higher acceptance up to 186% higher acceptance.



## B. Waiting List Information

Figure B10. Offer acceptance: Overall

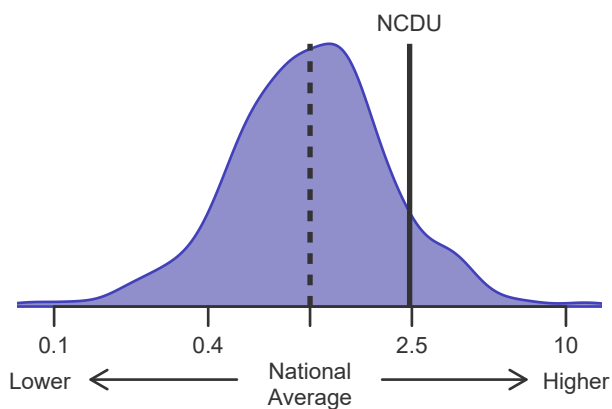


Figure B11. Offer acceptance: Low-KDRI

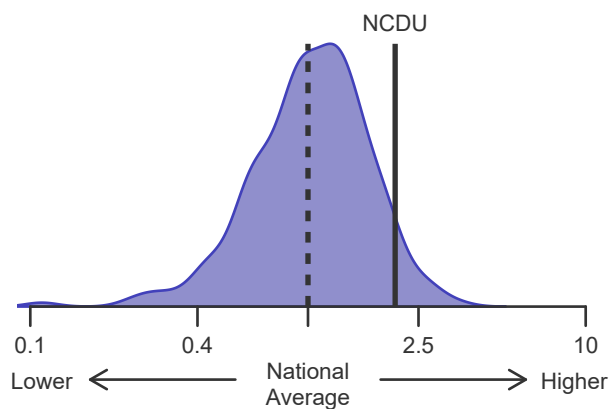


Figure B12. Offer acceptance: Medium-KDRI

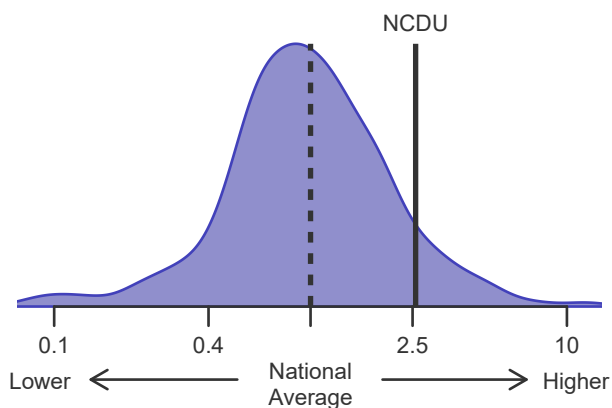


Figure B13. Offer acceptance: High-KDRI

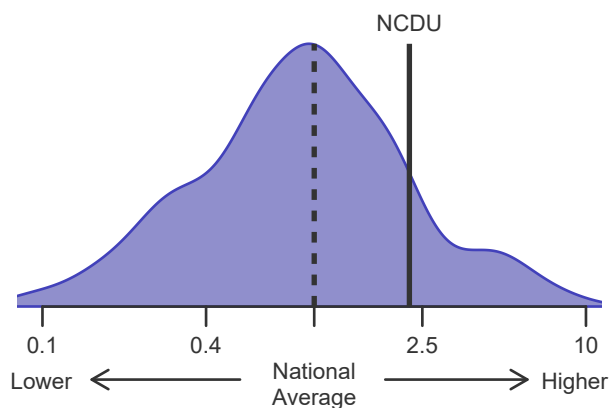
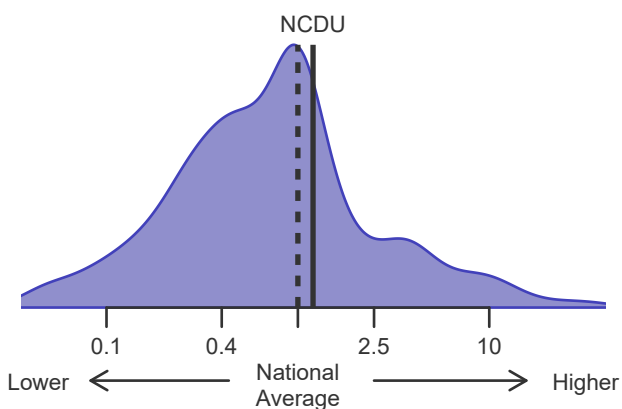


Figure B14. Offer acceptance: Offer number > 100





## C. Transplant Information

**Table C1D. Deceased donor transplant recipient demographic characteristics**

**Patients transplanted between 07/01/2020 and 06/30/2021**

Characteristic	Percentage in each category		
	Center (N=167)	Region (N=2,209)	U.S. (N=18,785)
<b>Ethnicity/Race (%)*</b>			
White	36.5	36.6	37.8
African-American	55.7	54.1	33.2
Hispanic/Latino	3.0	4.7	19.2
Asian	3.6	2.7	7.9
Other	1.2	1.9	1.9
Unknown	0.0	0.0	0.0
<b>Age (%)</b>			
<2 years	0.0	0.2	0.1
2-11 years	1.2	1.0	1.3
12-17	1.8	1.1	1.8
18-34	8.4	9.6	10.3
35-49 years	23.4	26.1	23.6
50-64 years	43.1	40.7	39.7
65-69 years	18.0	12.4	13.2
70+ years	4.2	8.8	10.0
<b>Gender (%)</b>			
Male	55.7	57.0	60.6
Female	44.3	43.0	39.4

\* 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 07/01/2020 and 06/30/2021

Characteristic	Percentage in each category		
	Center (N=41)	Region (N=514)	U.S. (N=5,904)
<b>Ethnicity/Race (%)*</b>			
White	68.3	72.4	63.4
African-American	26.8	20.2	11.9
Hispanic/Latino	2.4	4.5	16.9
Asian	2.4	1.9	6.5
Other	0.0	1.0	1.3
Unknown	0.0	0.0	0.0
<b>Age (%)</b>			
<2 years	0.0	0.2	0.4
2-11 years	2.4	1.9	2.0
12-17	0.0	2.9	1.9
18-34	9.8	15.0	16.0
35-49 years	29.3	27.6	25.5
50-64 years	53.7	36.4	35.4
65-69 years	2.4	9.3	10.0
70+ years	2.4	6.6	8.6
<b>Gender (%)</b>			
Male	68.3	64.4	63.8
Female	31.7	35.6	36.2

\* 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%.





## C. Transplant Information

**Table C2D. Deceased donor transplant recipient medical characteristics**

Patients transplanted between 07/01/2020 and 06/30/2021

Characteristic	Percentage in each category		
	Center (N=167)	Region (N=2,209)	U.S. (N=18,785)
<b>Blood Type (%)</b>			
O	39.5	46.1	46.8
A	33.5	35.4	34.7
B	19.8	13.3	13.8
AB	7.2	5.2	4.7
<b>Previous Transplant (%)</b>			
Yes	13.8	12.5	13.2
No	86.2	87.5	86.8
<b>Peak PRA/CPRA Prior to Transplant (%)</b>			
0-9%	57.5	54.5	60.5
10-79%	26.9	25.5	22.6
80+ %	15.6	19.9	16.9
Unknown	0.0	0.0	0.0
<b>Body Mass Index (%)</b>			
0-20	6.6	7.3	9.3
21-25	23.4	24.0	26.7
26-30	28.7	30.2	30.5
31-35	24.6	23.5	21.3
36-40	15.0	12.2	8.4
41+	1.8	2.4	1.5
Unknown	0.0	0.4	2.3
<b>Primary Disease (%)*</b>			
Glomerular Diseases	22.2	18.2	20.8
Tubular and Interstitial Disease	12.6	4.0	4.1
Polycystic Kidneys	7.8	6.7	7.2
Congenital, Familial, Metabolic	5.4	2.6	2.8
Diabetes	25.1	30.9	29.6
Renovascular & Vascular Diseases	0.0	0.3	0.1
Neoplasms	0.6	0.1	0.4
Hypertensive Nephrosclerosis	17.4	26.8	22.8
Other Kidney	9.0	10.3	11.8
Missing*	0.0	0.2	0.3

\* When "retransplant" is indicated, the primary disease is passed forward from the prior transplant in order to indicate the initial primary disease causing organ failure. "Missing" may include some patients for whom retransplant is indicated but no prior diagnosis can be found.



## C. Transplant Information

Table C2L. Living donor transplant recipient medical characteristics

Patients transplanted between 07/01/2020 and 06/30/2021

Characteristic	Percentage in each category		
	Center (N=41)	Region (N=514)	U.S. (N=5,904)
<b>Blood Type (%)</b>			
O	43.9	47.9	43.5
A	48.8	37.7	38.8
B	7.3	12.1	14.1
AB	0.0	2.3	3.6
<b>Previous Transplant (%)</b>			
Yes	22.0	9.3	10.6
No	78.0	90.7	89.4
<b>Peak PRA/CPRA Prior to Transplant (%)</b>			
0-9%	85.4	73.9	76.1
10-79%	12.2	22.4	18.8
80+ %	2.4	3.7	5.0
Unknown	0.0	0.0	0.1
<b>Body Mass Index (%)</b>			
0-20	4.9	10.5	12.4
21-25	43.9	25.1	28.0
26-30	29.3	31.5	31.5
31-35	14.6	24.3	19.5
36-40	7.3	6.2	6.2
41+	0.0	2.3	1.2
Unknown	0.0	0.0	1.2
<b>Primary Disease (%)*</b>			
Glomerular Diseases	34.1	26.8	28.8
Tubular and Interstitial Disease	14.6	4.7	5.4
Polycystic Kidneys	9.8	11.1	11.7
Congenital, Familial, Metabolic	4.9	5.1	4.4
Diabetes	17.1	21.4	23.7
Renovascular & Vascular Diseases	0.0	0.4	0.3
Neoplasms	4.9	0.8	0.5
Hypertensive Nephrosclerosis	12.2	21.0	15.9
Other Kidney	2.4	8.8	8.9
Missing*	0.0	0.0	0.3

\* When "retransplant" is indicated, the primary disease is passed forward from the prior transplant in order to indicate the initial primary disease causing organ failure. "Missing" may include some patients for whom retransplant is indicated but no prior diagnosis can be found.



## C. Transplant Information

**Table C3D. Deceased donor characteristics**

Transplants performed between 07/01/2020 and 06/30/2021

Donor Characteristic	Percentage in each category		
	Center (N=167)	Region (N=2,209)	U.S. (N=18,785)
<b>Cause of Death (%)</b>			
Deceased: Stroke	17.4	21.3	21.7
Deceased: MVA	8.4	12.2	13.0
Deceased: Other	74.3	66.5	65.3
<b>Ethnicity/Race (%)*</b>			
White	73.1	75.8	67.3
African-American	21.0	16.7	14.0
Hispanic/Latino	5.4	6.0	14.7
Asian	0.6	1.0	2.8
Other	0.0	0.5	1.2
Not Reported	0.0	0.0	0.0
<b>Age (%)</b>			
<2 years	0.0	0.5	0.8
2-11 years	2.4	2.3	2.2
12-17	3.6	3.8	3.6
18-34	35.3	33.4	31.9
35-49 years	32.3	35.7	33.5
50-64 years	24.6	22.1	25.5
65-69 years	1.2	1.9	2.2
70+ years	0.6	0.4	0.5
<b>Gender (%)</b>			
Male	64.7	62.9	62.9
Female	35.3	37.1	37.1
<b>Blood Type (%)</b>			
O	40.1	47.8	48.6
A	35.9	37.4	36.9
B	19.8	10.7	11.2
AB	4.2	4.1	3.2
Unknown	0.0	0.0	0.0

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



## C. Transplant Information

Table C3L. Living donor characteristics

Transplants performed between 07/01/2020 and 06/30/2021

Donor Characteristic	Percentage in each category		
	Center (N=41)	Region (N=514)	U.S. (N=5,904)
<b>Ethnicity/Race (%)*</b>			
White	70.7	81.3	70.8
African-American	19.5	11.1	7.6
Hispanic/Latino	7.3	5.1	15.1
Asian	2.4	1.2	4.5
Other	0.0	1.4	2.0
Not Reported	0.0	0.0	0.0
<b>Age (%)</b>			
0-11 years	0.0	0.0	0.0
12-17	0.0	0.0	0.0
18-34	24.4	25.3	26.9
35-49 years	41.5	39.7	37.8
50-64 years	31.7	30.5	30.1
65-69 years	2.4	3.1	4.0
70+ years	0.0	1.4	1.2
<b>Gender (%)</b>			
Male	24.4	30.0	34.7
Female	75.6	70.0	65.3
<b>Blood Type (%)</b>			
O	70.7	69.5	61.8
A	24.4	24.3	28.1
B	4.9	6.0	8.7
AB	0.0	0.2	1.4
Unknown	0.0	0.0	0.0

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



## C. Transplant Information

**Table C4D. Deceased donor transplant characteristics**  
**Transplants performed between 07/01/2020 and 06/30/2021**

Transplant Characteristic	Percentage in each category		
	Center (N=167)	Region (N=2,209)	U.S. (N=18,785)
<b>Cold Ischemic Time (Hours): Local (%)</b>			
Deceased: 0-11 hr	16.9	30.6	30.3
Deceased: 12-21 hr	56.6	54.6	50.0
Deceased: 22-31 hr	20.5	14.1	16.2
Deceased: 32-41 hr	4.8	0.6	2.1
Deceased: 42+ hr	1.2	0.2	0.4
Not Reported	0.0	0.0	0.9
<b>Cold Ischemic Time (Hours): Shared (%)</b>			
Deceased: 0-11 hr	4.8	8.0	10.6
Deceased: 12-21 hr	22.6	44.7	39.5
Deceased: 22-31 hr	44.0	38.6	35.4
Deceased: 32-41 hr	26.2	7.9	10.9
Deceased: 42+ hr	2.4	0.7	1.9
Not Reported	0.0	0.0	1.5
<b>Level of Mismatch (%)</b>			
A Locus Mismatches (%)			
0	13.2	12.7	11.6
1	30.5	37.3	38.5
2	56.3	50.0	49.7
Not Reported	0.0	0.0	0.2
B Locus Mismatches (%)			
0	7.8	7.7	6.9
1	26.3	24.6	25.5
2	65.9	67.7	67.4
Not Reported	0.0	0.0	0.2
DR Locus Mismatches (%)			
0	17.4	17.0	15.9
1	44.9	47.8	47.3
2	37.7	35.2	36.6
Not Reported	0.0	0.0	0.2
Total Mismatches (%)			
0	5.4	5.3	4.3
1	1.2	1.5	1.2
2	1.2	4.0	4.7
3	20.4	14.6	14.2
4	22.8	26.3	27.2
5	28.7	32.5	32.8
6	20.4	15.7	15.5
Not Reported	0.0	0.0	0.2
<b>Procedure Type (%)</b>			
Single organ	90.4	95.7	93.9
Multi organ	9.6	4.3	6.1
<b>Dialysis in First Week After Transplant (%)</b>			
Yes	41.9	33.0	30.3
No	58.1	67.0	69.6
Not Reported	0.0	0.0	0.1
<b>Donor Location (%)</b>			
Local Donation Service Area (DSA)	49.7	57.0	61.0
Another Donation Service Area (DSA)	50.3	43.0	39.0
<b>Median Time in Hospital After Transplant</b>	6.0 Days	4.0 Days	5.0 Days



## C. Transplant Information

**Table C4L. Living donor transplant characteristics**  
**Transplants performed between 07/01/2020 and 06/30/2021**

Transplant Characteristic	Percentage in each category		
	Center (N=41)	Region (N=514)	U.S. (N=5,904)
<b>Relation with Donor (%)</b>			
Related	29.3	37.4	39.5
Unrelated	70.7	62.5	60.2
Not Reported	0.0	0.2	0.3
<b>Level of Mismatch (%)</b>			
A Locus Mismatches (%)			
0	12.2	13.8	16.2
1	39.0	39.1	48.2
2	48.8	28.6	31.5
Not Reported	0.0	18.5	4.1
B Locus Mismatches (%)			
0	7.3	10.5	9.8
1	26.8	31.5	41.2
2	65.9	39.5	44.8
Not Reported	0.0	18.5	4.1
DR Locus Mismatches (%)			
0	9.8	13.4	15.8
1	29.3	36.4	46.7
2	61.0	31.7	33.4
Not Reported	0.0	18.5	4.1
Total Mismatches (%)			
0	7.3	5.8	4.8
1	0.0	2.9	3.9
2	2.4	8.9	12.0
3	14.6	17.3	21.8
4	17.1	11.7	17.6
5	22.0	21.8	23.3
6	36.6	13.0	12.6
Not Reported	0.0	18.5	4.1
<b>Procedure Type (%)</b>			
Single organ	100.0	100.0	100.0
Multi organ	0.0	0.0	0.0
<b>Dialysis in First Week After Transplant (%)</b>			
Yes	4.9	3.1	2.8
No	95.1	96.9	97.0
Not Reported	0.0	0.0	0.2
<b>Median Time in Hospital After Transplant</b>	4.0 Days	3.0 Days	4.0 Days



## C. Transplant Information

**Table C5. Adult (18+) 1-month survival with a functioning graft**

Single organ transplants performed between 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Deaths and retransplants are considered graft failures

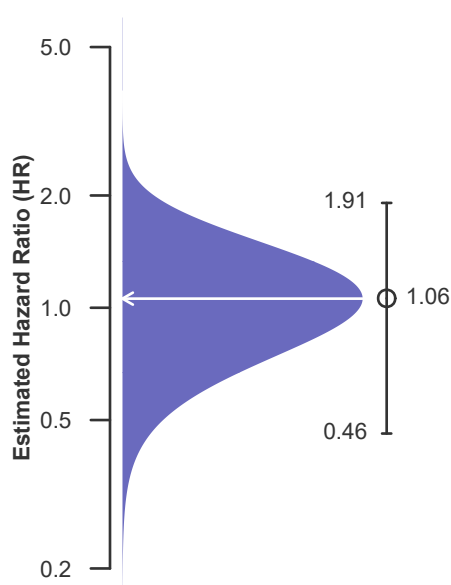
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	374	48,337
Estimated probability of surviving with a functioning graft at 1 month (unadjusted for patient and donor characteristics)	98.40%	98.63%
Expected probability of surviving with a functioning graft at 1 month (adjusted for patient and donor characteristics)	98.48%	--
Number of observed graft failures (including deaths) during the first month after transplant	6	655
Number of expected graft failures (including deaths) during the first month after transplant	5.56	--
Estimated hazard ratio*	1.06	--
95% credible interval for the hazard ratio**	[0.46, 1.91]	--

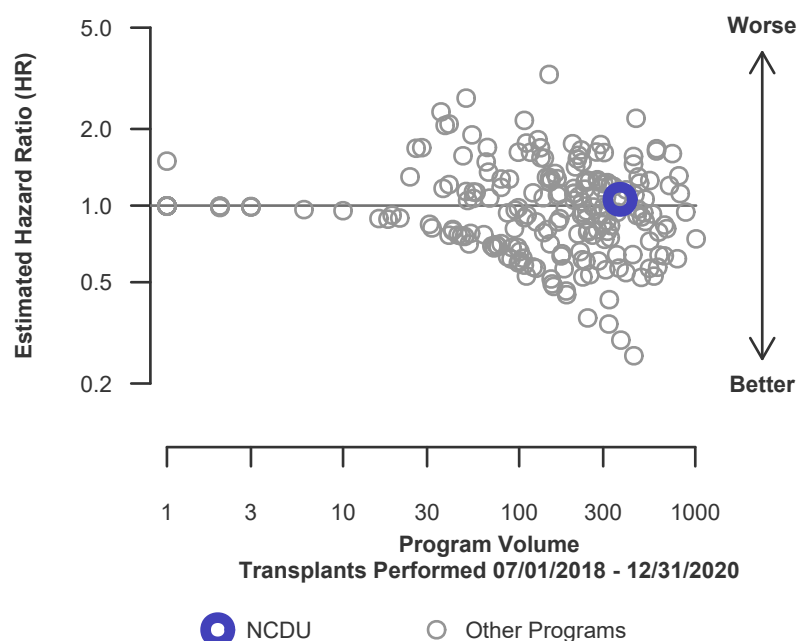
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.46, 1.91], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 6% higher risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 54% reduced risk up to 91% increased risk.

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



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







## C. Transplant Information

**Table C5D. Adult (18+) 1-month survival with a functioning deceased donor graft**

Single organ transplants performed between 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Deaths and retransplants are considered graft failures

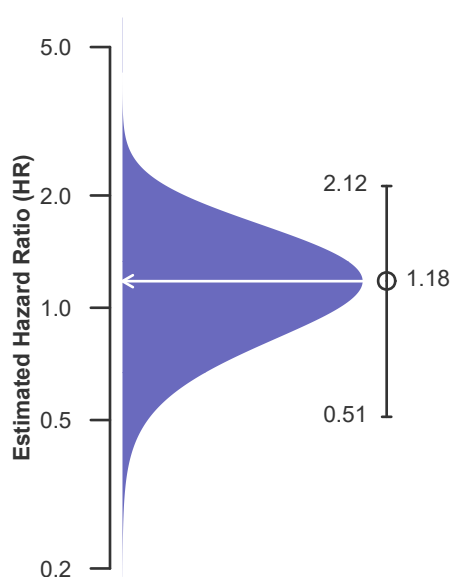
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	276	34,231
Estimated probability of surviving with a functioning graft at 1 month (unadjusted for patient and donor characteristics)	97.83%	98.38%
Expected probability of surviving with a functioning graft at 1 month (adjusted for patient and donor characteristics)	98.22%	--
Number of observed graft failures (including deaths) during the first month after transplant	6	550
Number of expected graft failures (including deaths) during the first month after transplant	4.79	--
Estimated hazard ratio*	1.18	--
95% credible interval for the hazard ratio**	[0.51, 2.12]	--

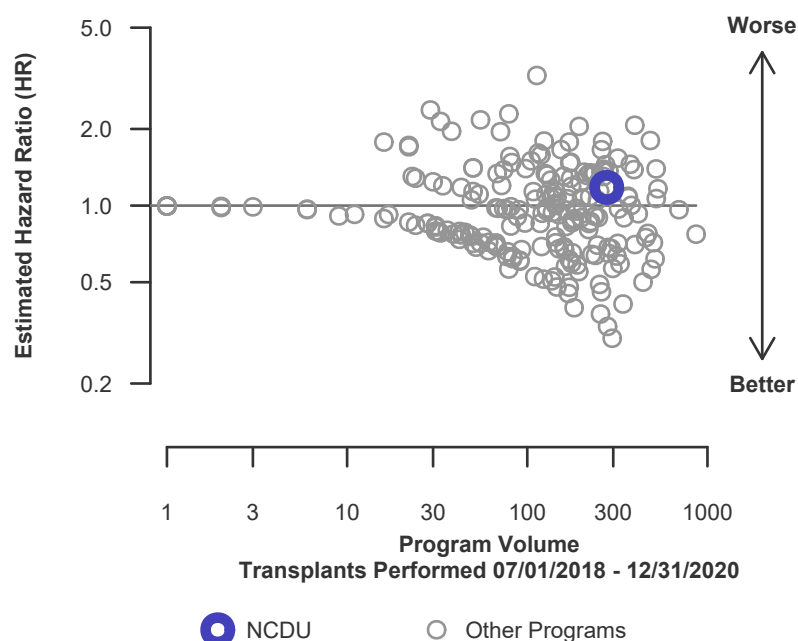
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.51, 2.12], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 18% higher risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 49% reduced risk up to 112% increased risk.

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



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





## C. Transplant Information

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

Single organ transplants performed between 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Deaths and retransplants are considered graft failures

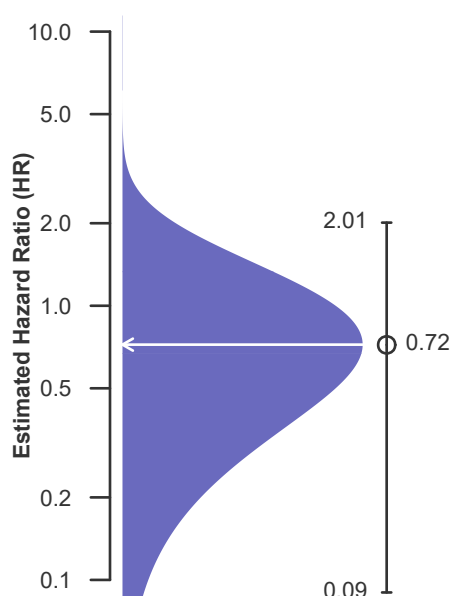
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	98	14,106
Estimated probability of surviving with a functioning graft at 1 month (unadjusted for patient and donor characteristics)	100.00%	99.25%
Expected probability of surviving with a functioning graft at 1 month (adjusted for patient and donor characteristics)	99.21%	--
Number of observed graft failures (including deaths) during the first month after transplant	0	105
Number of expected graft failures (including deaths) during the first month after transplant	0.77	--
Estimated hazard ratio*	0.72	--
95% credible interval for the hazard ratio**	[0.09, 2.01]	--

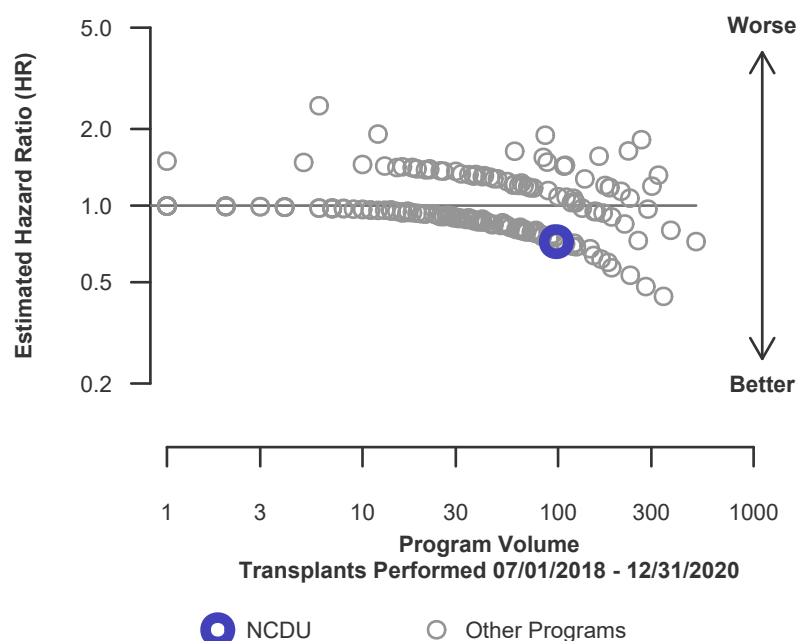
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.09, 2.01], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 28% lower risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 91% reduced risk up to 101% increased risk.

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



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





## C. Transplant Information

**Table C6. Adult (18+) 1-year survival with a functioning graft**

Single organ transplants performed between 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Deaths and retransplants are considered graft failures

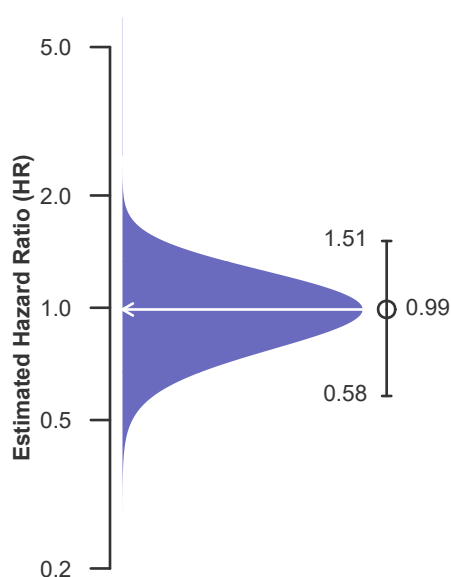
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	374	48,337
Estimated probability of surviving with a functioning graft at 1 year (unadjusted for patient and donor characteristics)	94.41%	95.19%
Expected probability of surviving with a functioning graft at 1 year (adjusted for patient and donor characteristics)	94.59%	--
Number of observed graft failures (including deaths) during the first year after transplant	15	1,818
Number of expected graft failures (including deaths) during the first year after transplant	15.18	--
Estimated hazard ratio*	0.99	--
95% credible interval for the hazard ratio**	[0.58, 1.51]	--

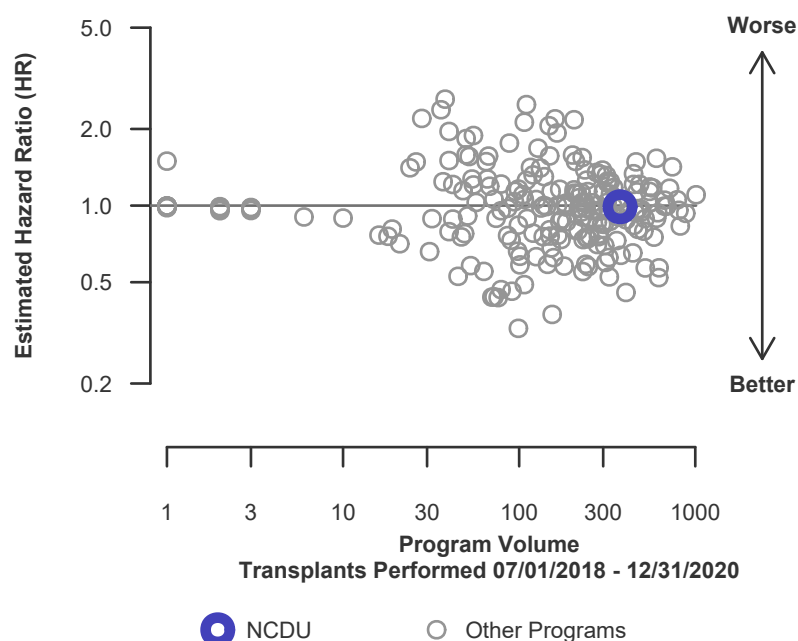
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.58, 1.51], 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 42% reduced risk up to 51% increased risk.

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



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





## C. Transplant Information

**Table C6D. Adult (18+) 1-year survival with a functioning deceased donor graft**

Single organ transplants performed between 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Deaths and retransplants are considered graft failures

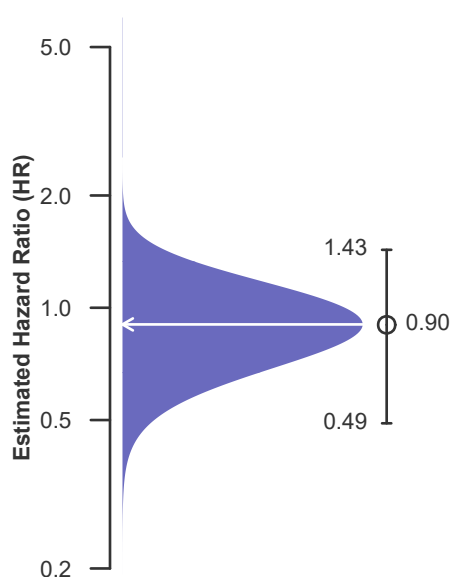
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	276	34,231
Estimated probability of surviving with a functioning graft at 1 year (unadjusted for patient and donor characteristics)	94.54%	94.00%
Expected probability of surviving with a functioning graft at 1 year (adjusted for patient and donor characteristics)	93.42%	--
Number of observed graft failures (including deaths) during the first year after transplant	12	1,586
Number of expected graft failures (including deaths) during the first year after transplant	13.52	--
Estimated hazard ratio*	0.90	--
95% credible interval for the hazard ratio**	[0.49, 1.43]	--

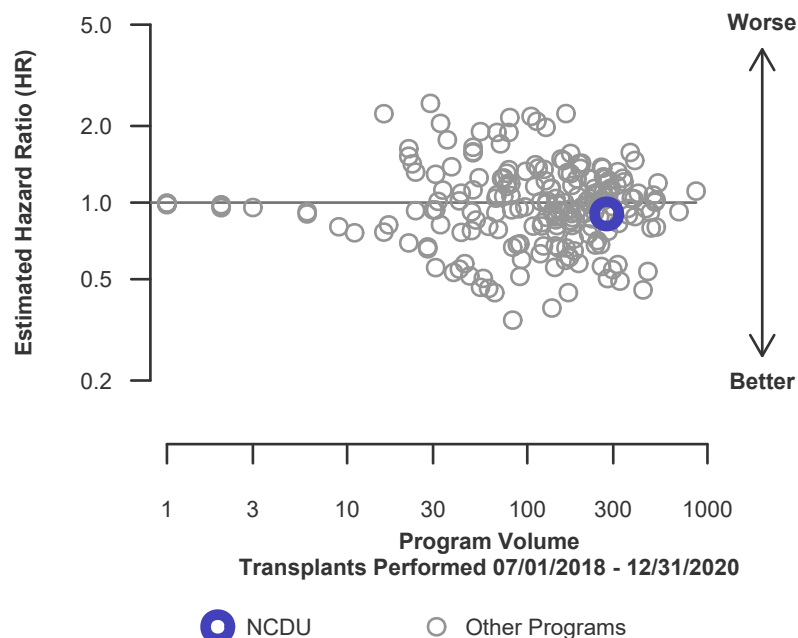
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.49, 1.43], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 10% lower risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 51% reduced risk up to 43% increased risk.

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



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





## C. Transplant Information

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

Single organ transplants performed between 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Deaths and retransplants are considered graft failures

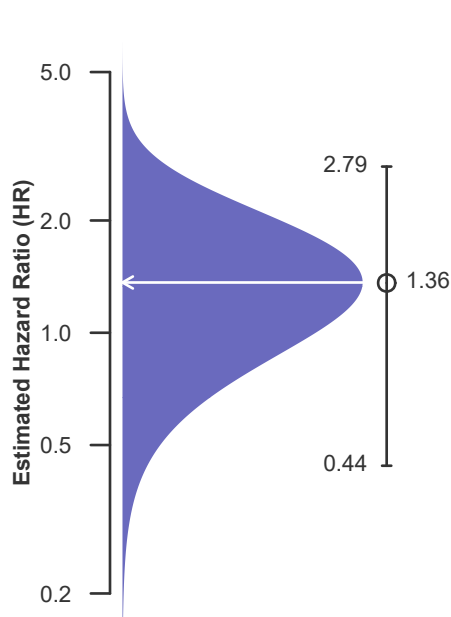
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	98	14,106
Estimated probability of surviving with a functioning graft at 1 year (unadjusted for patient and donor characteristics)	94.00%	97.99%
Expected probability of surviving with a functioning graft at 1 year (adjusted for patient and donor characteristics)	97.89%	--
Number of observed graft failures (including deaths) during the first year after transplant	3	232
Number of expected graft failures (including deaths) during the first year after transplant	1.67	--
Estimated hazard ratio*	1.36	--
95% credible interval for the hazard ratio**	[0.44, 2.79]	--

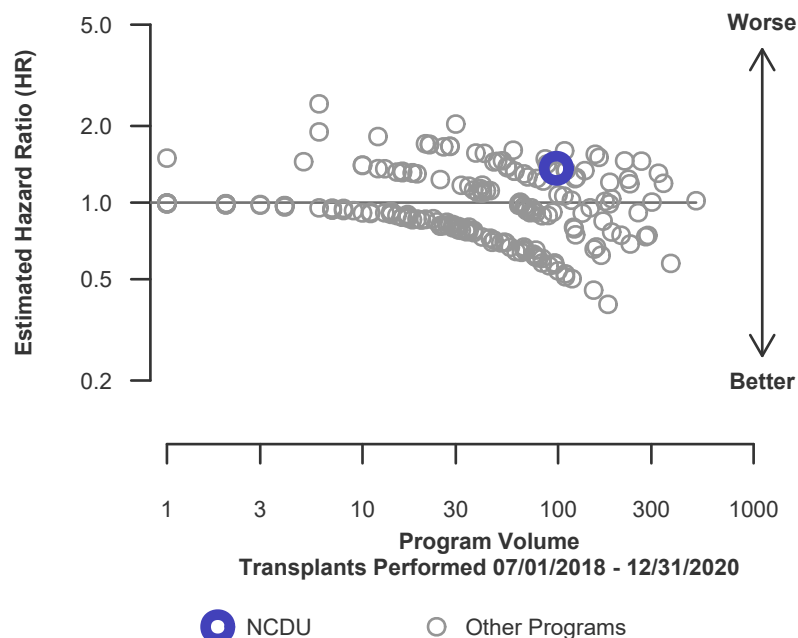
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.44, 2.79], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 36% higher risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 56% reduced risk up to 179% increased risk.

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



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





## C. Transplant Information

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

Single organ transplants performed between 01/01/2016 and 06/30/2018

Deaths and retransplants are considered graft failures

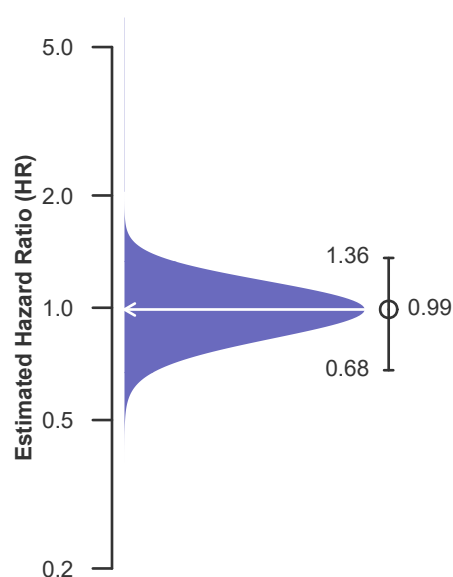
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	337	44,895
Estimated probability of surviving with a functioning graft at 3 years (unadjusted for patient and donor characteristics)	90.10%	90.33%
Expected probability of surviving with a functioning graft at 3 years (adjusted for patient and donor characteristics)	89.98%	--
Number of observed graft failures (including deaths) during the first 3 years after transplant	30	3,888
Number of expected graft failures (including deaths) during the first 3 years after transplant	30.35	--
Estimated hazard ratio*	0.99	--
95% credible interval for the hazard ratio**	[0.68, 1.36]	--

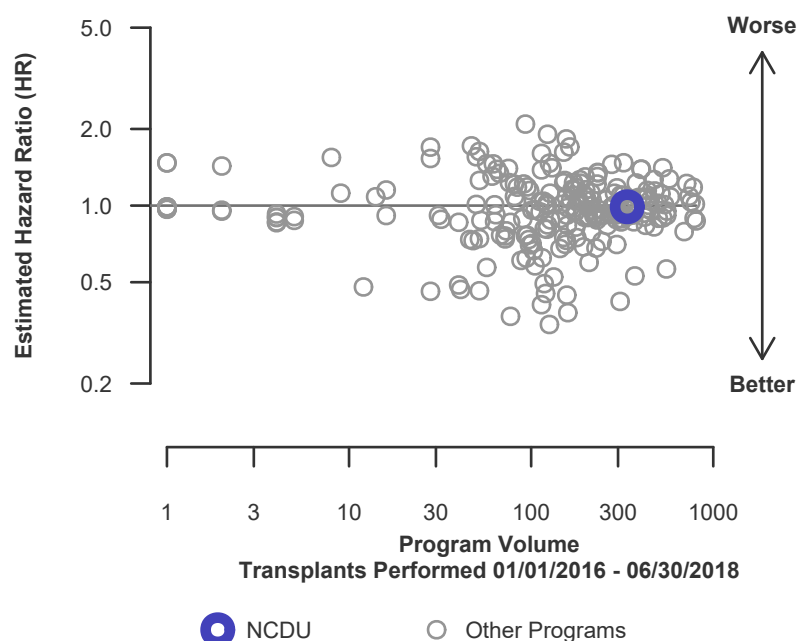
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.68, 1.36], 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 32% reduced risk up to 36% 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 01/01/2016 and 06/30/2018

Deaths and retransplants are considered graft failures

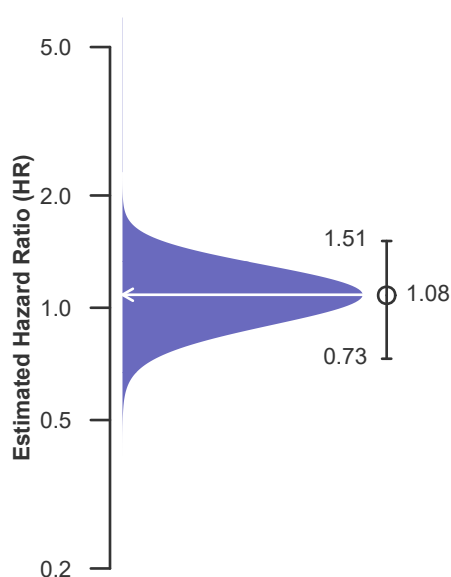
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	234	30,985
Estimated probability of surviving with a functioning graft at 3 years (unadjusted for patient and donor characteristics)	87.53%	88.44%
Expected probability of surviving with a functioning graft at 3 years (adjusted for patient and donor characteristics)	88.24%	--
Number of observed graft failures (including deaths) during the first 3 years after transplant	27	3,234
Number of expected graft failures (including deaths) during the first 3 years after transplant	24.76	--
Estimated hazard ratio*	1.08	--
95% credible interval for the hazard ratio**	[0.73, 1.51]	--

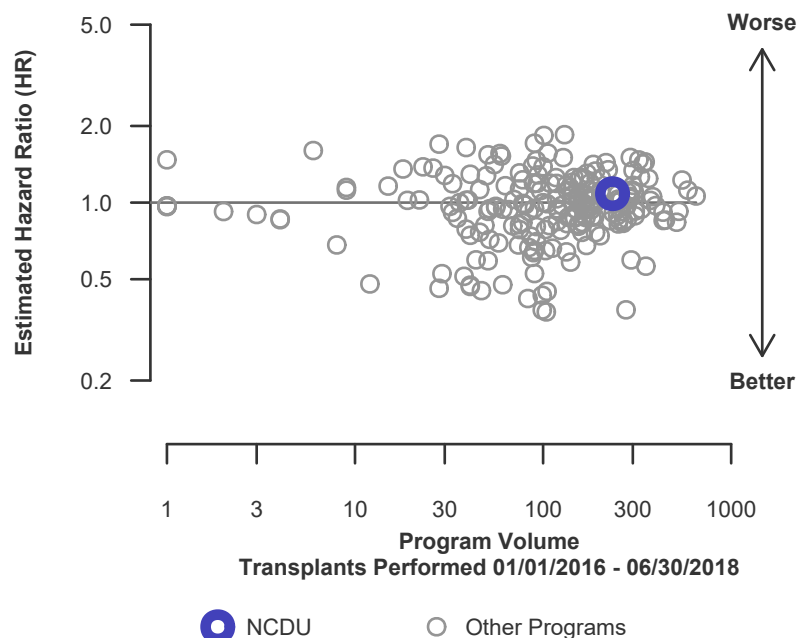
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.73, 1.51], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 8% higher risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 27% reduced risk up to 51% increased risk.

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



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







## C. Transplant Information

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

Single organ transplants performed between 01/01/2016 and 06/30/2018

Deaths and retransplants are considered graft failures

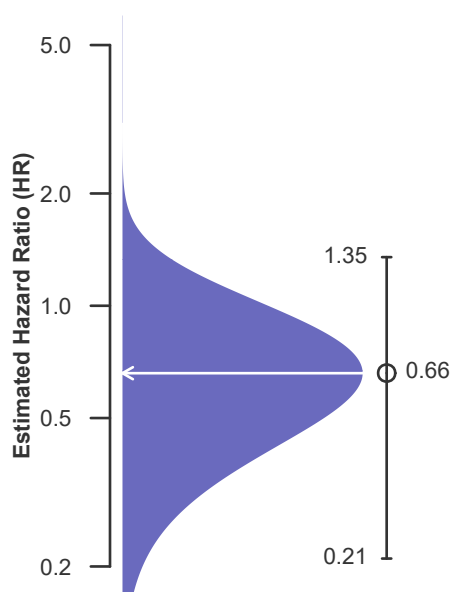
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	103	13,910
Estimated probability of surviving with a functioning graft at 3 years (unadjusted for patient and donor characteristics)	95.92%	94.57%
Expected probability of surviving with a functioning graft at 3 years (adjusted for patient and donor characteristics)	93.96%	--
Number of observed graft failures (including deaths) during the first 3 years after transplant	3	654
Number of expected graft failures (including deaths) during the first 3 years after transplant	5.58	--
Estimated hazard ratio*	0.66	--
95% credible interval for the hazard ratio**	[0.21, 1.35]	--

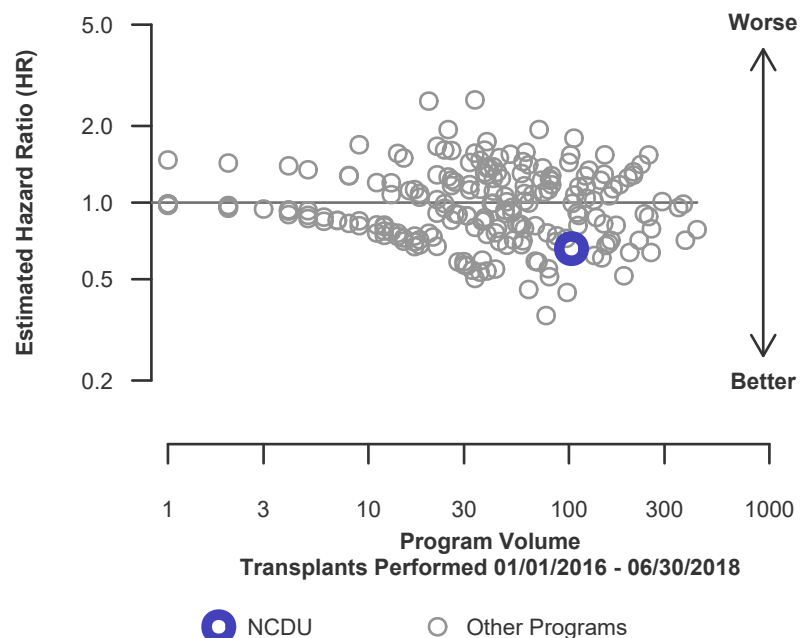
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.21, 1.35], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 34% lower risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 79% reduced risk up to 35% increased risk.

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



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





## C. Transplant Information

**Table C8. Pediatric (<18) 1-month survival with a functioning graft**

Single organ transplants performed between 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Deaths and retransplants are considered graft failures

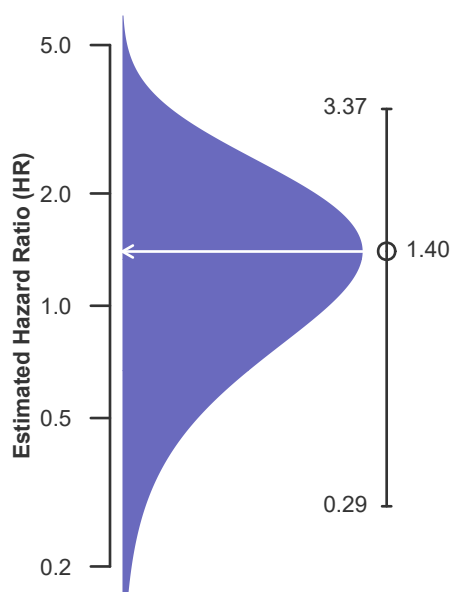
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	13	1,922
Estimated probability of surviving with a functioning graft at 1 month (unadjusted for patient and donor characteristics)	92.31%	98.85%
Expected probability of surviving with a functioning graft at 1 month (adjusted for patient and donor characteristics)	98.81%	--
Number of observed graft failures (including deaths) during the first month after transplant	1	22
Number of expected graft failures (including deaths) during the first month after transplant	0.15	--
Estimated hazard ratio*	1.40	--
95% credible interval for the hazard ratio**	[0.29, 3.37]	--

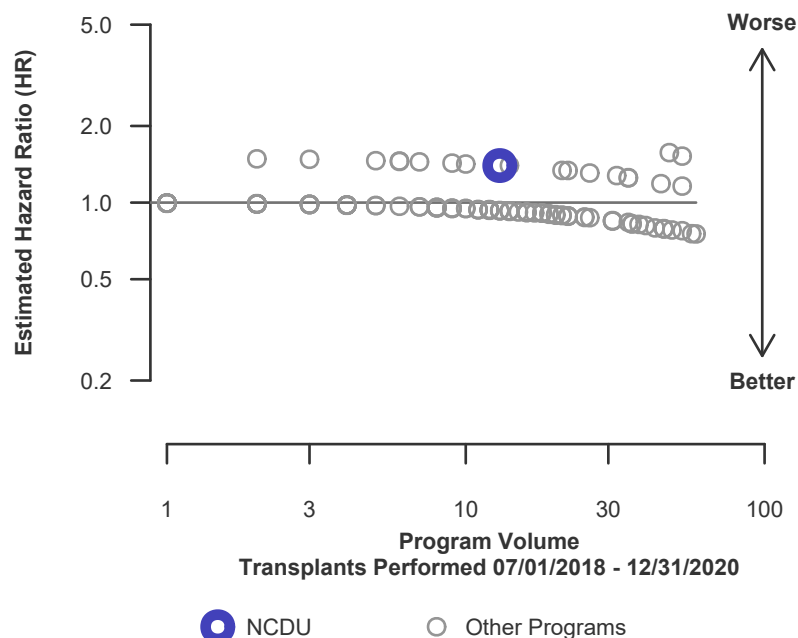
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.29, 3.37], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 40% higher risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 71% reduced risk up to 237% 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 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Deaths and retransplants are considered graft failures

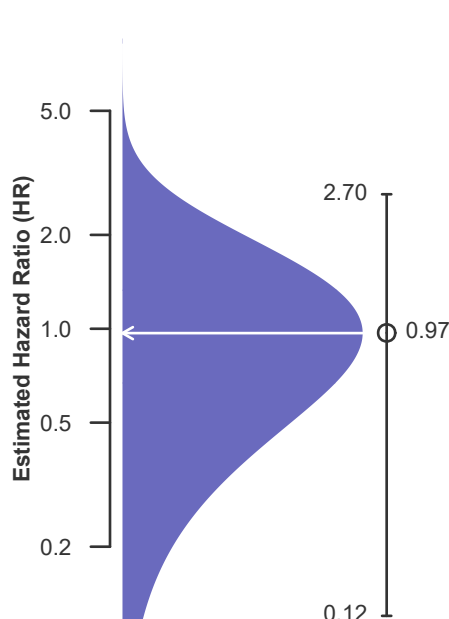
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	6	1,293
Estimated probability of surviving with a functioning graft at 1 month (unadjusted for patient and donor characteristics)	100.00%	98.91%
Expected probability of surviving with a functioning graft at 1 month (adjusted for patient and donor characteristics)	98.91%	--
Number of observed graft failures (including deaths) during the first month after transplant	0	14
Number of expected graft failures (including deaths) during the first month after transplant	0.07	--
Estimated hazard ratio*	0.97	--
95% credible interval for the hazard ratio**	[0.12, 2.70]	--

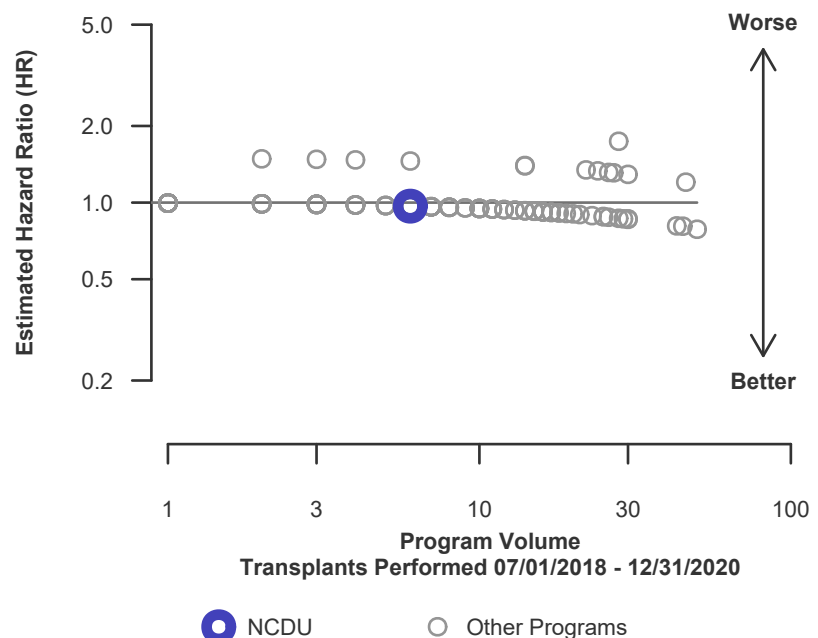
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, 2.70], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 3% lower risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 88% reduced risk up to 170% 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 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Deaths and retransplants are considered graft failures

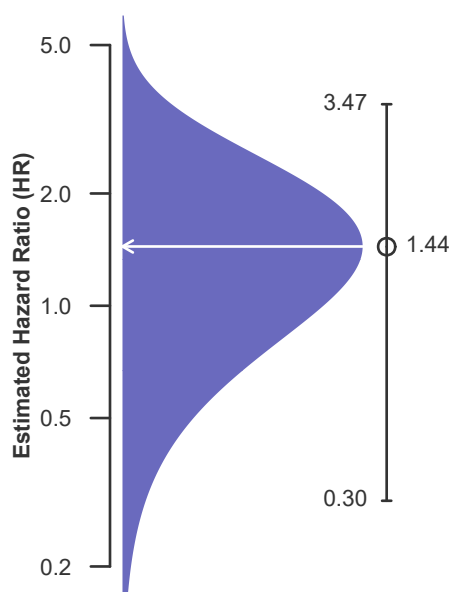
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	7	629
Estimated probability of surviving with a functioning graft at 1 month (unadjusted for patient and donor characteristics)	85.71%	98.72%
Expected probability of surviving with a functioning graft at 1 month (adjusted for patient and donor characteristics)	98.72%	--
Number of observed graft failures (including deaths) during the first month after transplant	1	8
Number of expected graft failures (including deaths) during the first month after transplant	0.08	--
Estimated hazard ratio*	1.44	--
95% credible interval for the hazard ratio**	[0.30, 3.47]	--

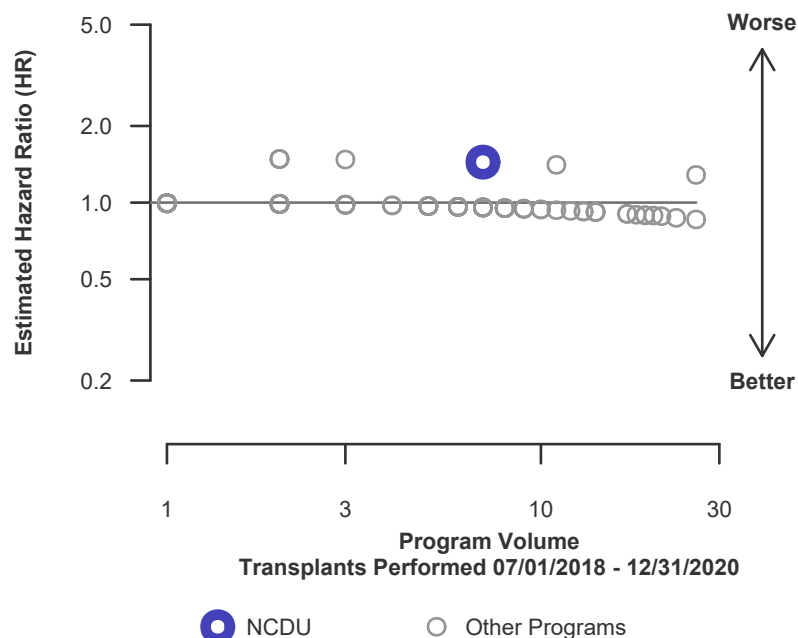
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.30, 3.47], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 44% higher risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 70% reduced risk up to 247% 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 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Deaths and retransplants are considered graft failures

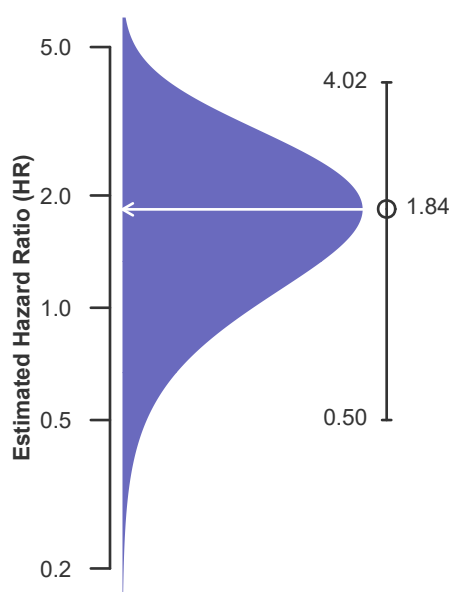
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	13	1,922
Estimated probability of surviving with a functioning graft at 1 year (unadjusted for patient and donor characteristics)	61.54%	97.75%
Expected probability of surviving with a functioning graft at 1 year (adjusted for patient and donor characteristics)	97.95%	--
Number of observed graft failures (including deaths) during the first year after transplant	2	33
Number of expected graft failures (including deaths) during the first year after transplant	0.18	--
Estimated hazard ratio*	1.84	--
95% credible interval for the hazard ratio**	[0.50, 4.02]	--

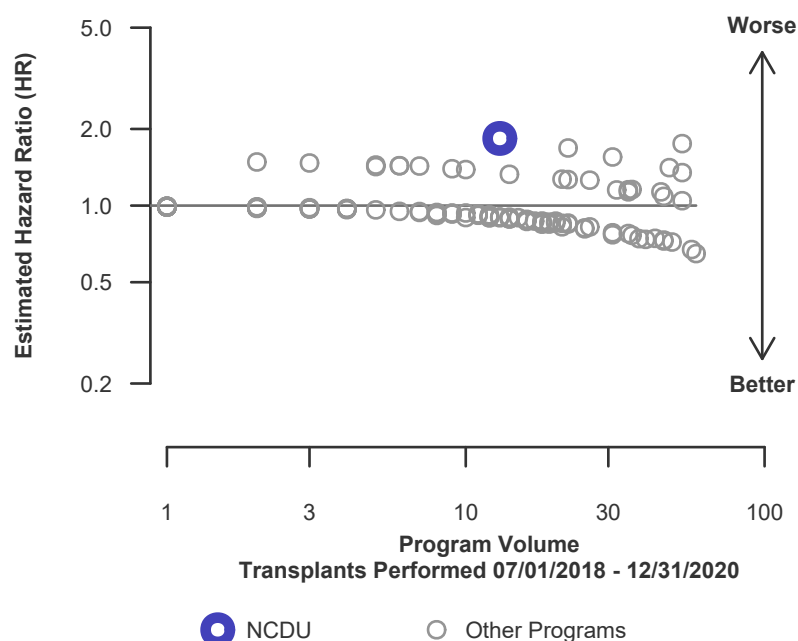
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.50, 4.02], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 84% higher risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 50% reduced risk up to 302% 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 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Deaths and retransplants are considered graft failures

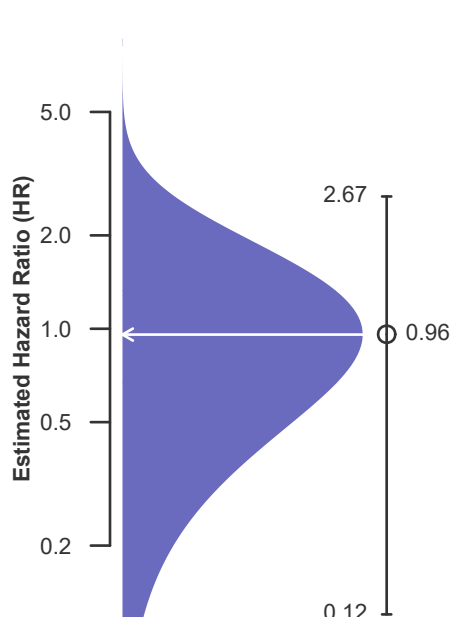
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	6	1,293
Estimated probability of surviving with a functioning graft at 1 year (unadjusted for patient and donor characteristics)	100.00%	97.43%
Expected probability of surviving with a functioning graft at 1 year (adjusted for patient and donor characteristics)	97.43%	--
Number of observed graft failures (including deaths) during the first year after transplant	0	24
Number of expected graft failures (including deaths) during the first year after transplant	0.09	--
Estimated hazard ratio*	0.96	--
95% credible interval for the hazard ratio**	[0.12, 2.67]	--

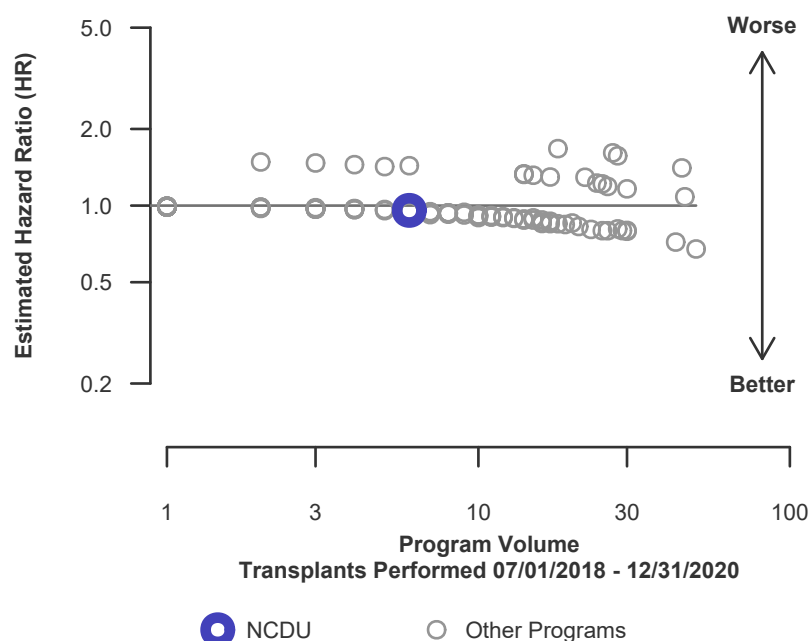
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, 2.67], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 4% lower risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 88% reduced risk up to 167% 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 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Deaths and retransplants are considered graft failures

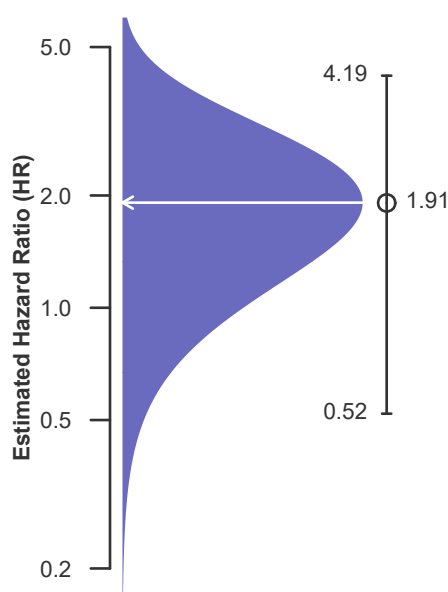
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	7	629
Estimated probability of surviving with a functioning graft at 1 year (unadjusted for patient and donor characteristics)	57.14%	98.39%
Expected probability of surviving with a functioning graft at 1 year (adjusted for patient and donor characteristics)	98.39%	--
Number of observed graft failures (including deaths) during the first year after transplant	2	9
Number of expected graft failures (including deaths) during the first year after transplant	0.09	--
Estimated hazard ratio*	1.91	--
95% credible interval for the hazard ratio**	[0.52, 4.19]	--

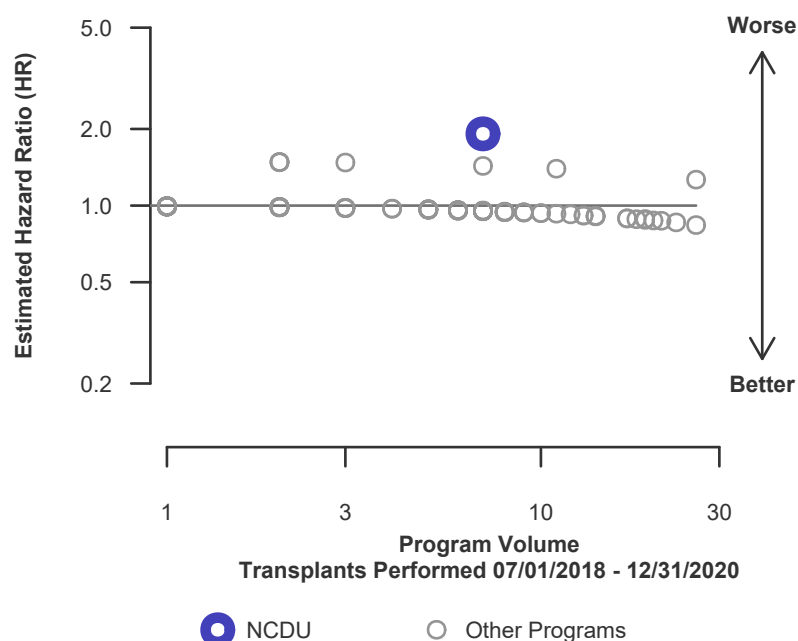
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.52, 4.19], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 91% higher risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 48% reduced risk up to 319% 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

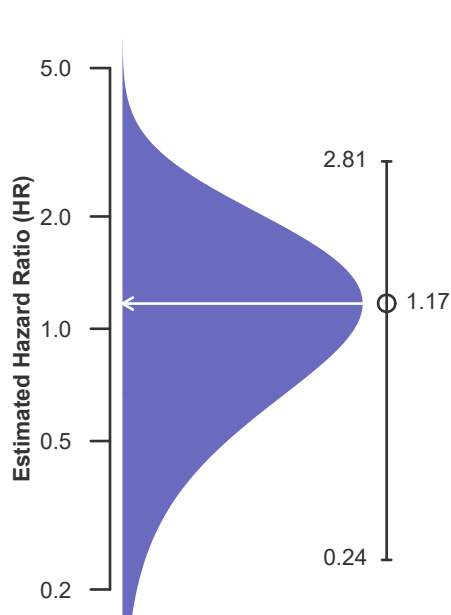
**Table C10. Pediatric (<18) 3-year survival with a functioning graft**  
Single organ transplants performed between 01/01/2016 and 06/30/2018  
Deaths and retransplants are considered graft failures  
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	11	2,089
Estimated probability of surviving with a functioning graft at 3 years (unadjusted for patient and donor characteristics)	80.00%	94.70%
Expected probability of surviving with a functioning graft at 3 years (adjusted for patient and donor characteristics)	94.77%	--
Number of observed graft failures (including deaths) during the first 3 years after transplant	1	101
Number of expected graft failures (including deaths) during the first 3 years after transplant	0.57	--
Estimated hazard ratio*	1.17	--
95% credible interval for the hazard ratio**	[0.24, 2.81]	--

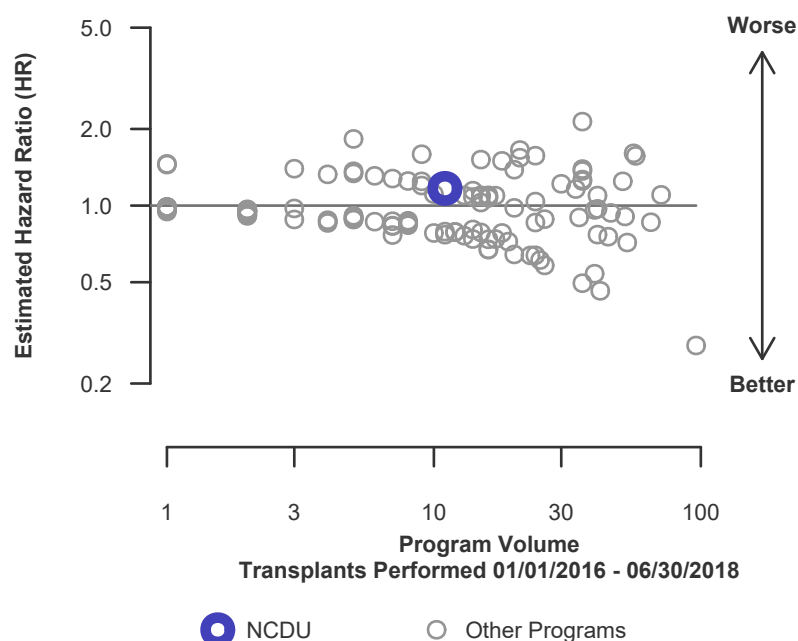
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.24, 2.81], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 17% higher risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 76% reduced risk up to 181% 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 01/01/2016 and 06/30/2018

Deaths and retransplants are considered graft failures

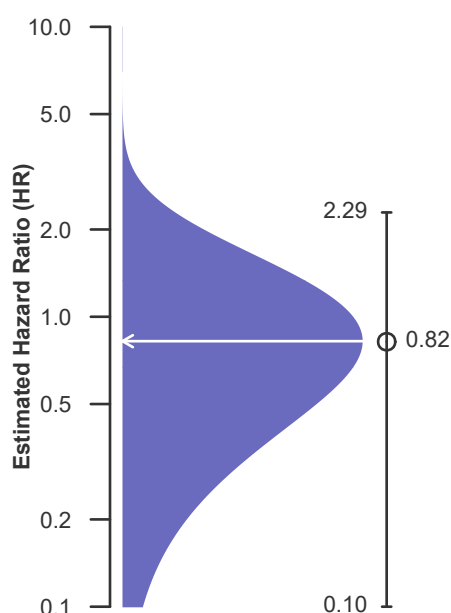
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	5	1,421
Estimated probability of surviving with a functioning graft at 3 years (unadjusted for patient and donor characteristics)	100.00%	93.47%
Expected probability of surviving with a functioning graft at 3 years (adjusted for patient and donor characteristics)	91.71%	--
Number of observed graft failures (including deaths) during the first 3 years after transplant	0	85
Number of expected graft failures (including deaths) during the first 3 years after transplant	0.43	--
Estimated hazard ratio*	0.82	--
95% credible interval for the hazard ratio**	[0.10, 2.29]	--

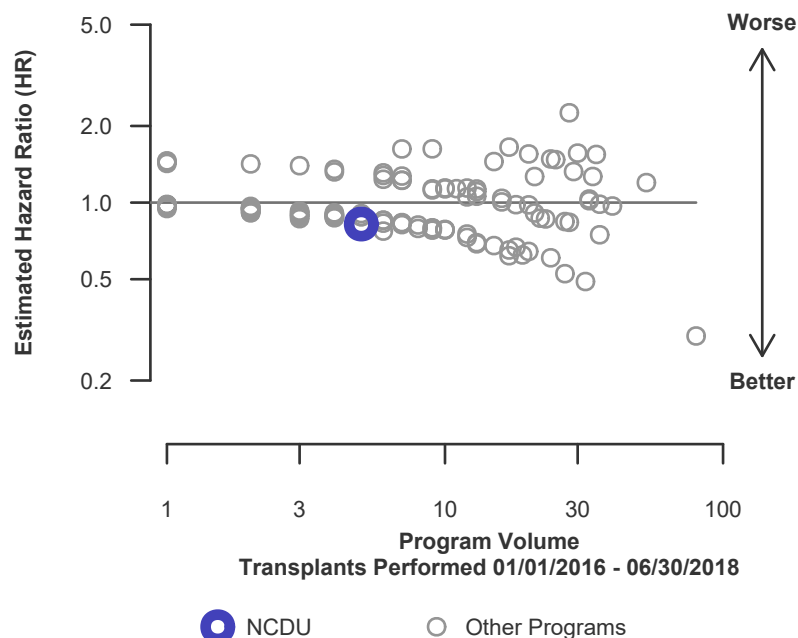
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.10, 2.29], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 18% lower risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 90% reduced risk up to 129% 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 01/01/2016 and 06/30/2018

Deaths and retransplants are considered graft failures

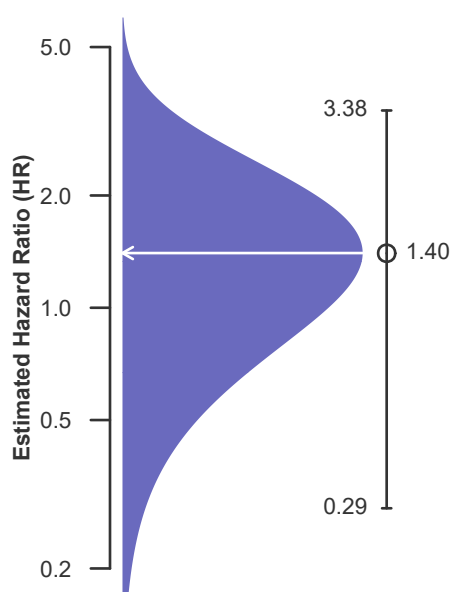
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	6	668
Estimated probability of surviving with a functioning graft at 3 years (unadjusted for patient and donor characteristics)	0.00%	97.32%
Expected probability of surviving with a functioning graft at 3 years (adjusted for patient and donor characteristics)	97.32%	--
Number of observed graft failures (including deaths) during the first 3 years after transplant	1	16
Number of expected graft failures (including deaths) during the first 3 years after transplant	0.14	--
Estimated hazard ratio*	1.40	--
95% credible interval for the hazard ratio**	[0.29, 3.38]	--

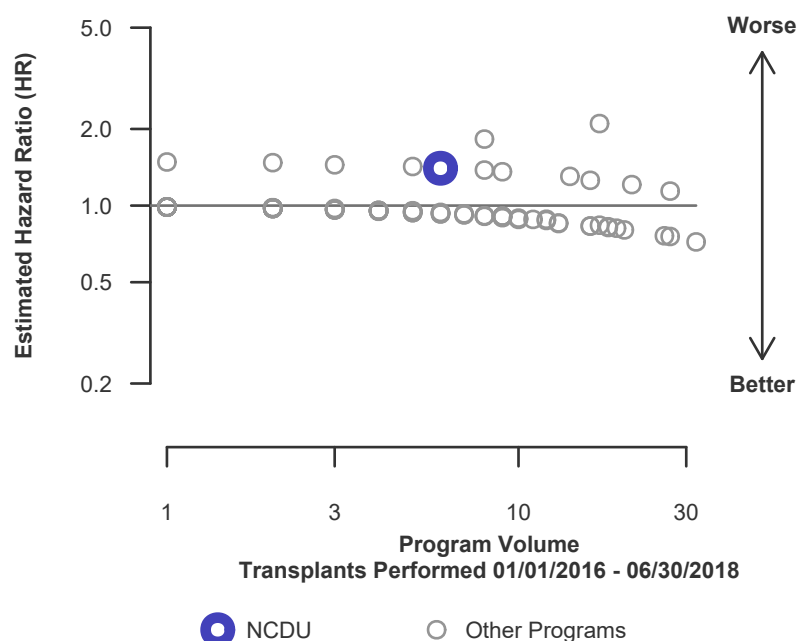
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.29, 3.38], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 40% higher risk of graft failure compared to an average program, but NCDU's performance could plausibly range from 71% reduced risk up to 238% 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 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Retransplants excluded

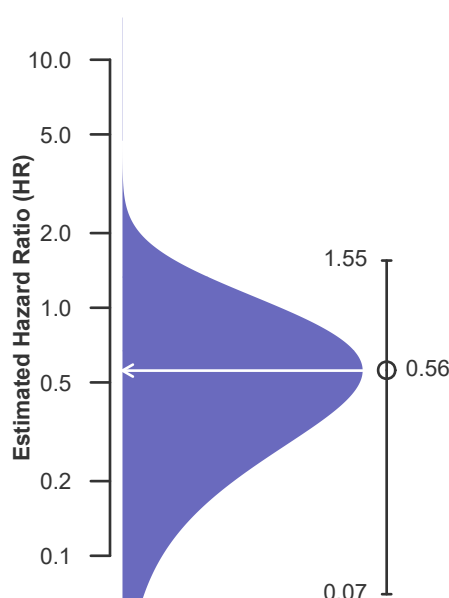
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	334	43,160
Estimated probability of surviving at 1 month (unadjusted for patient and donor characteristics)	100.00%	99.53%
Expected probability of surviving at 1 month (adjusted for patient and donor characteristics)	99.52%	--
Number of observed deaths during the first month after transplant	0	201
Number of expected deaths during the first month after transplant	1.58	--
Estimated hazard ratio*	0.56	--
95% credible interval for the hazard ratio**	[0.07, 1.55]	--

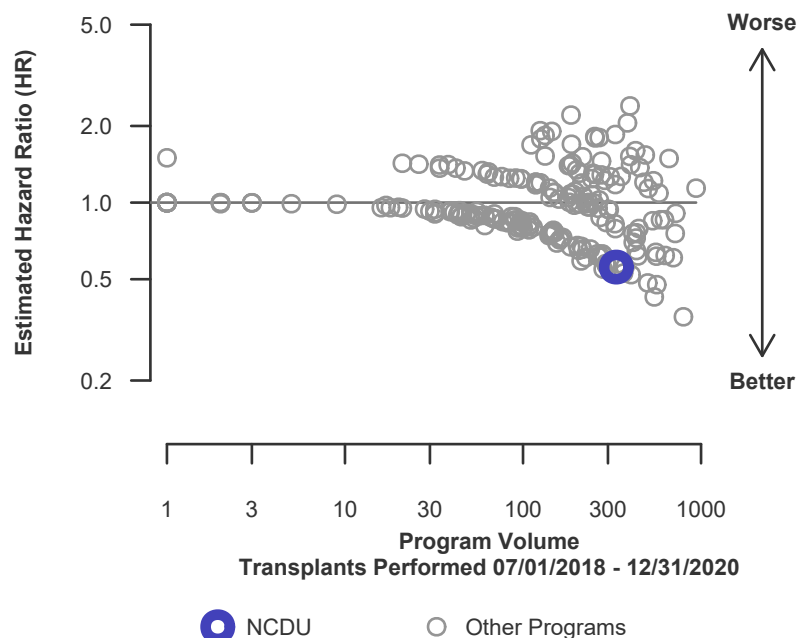
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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 44% 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 C13. Adult (18+) 1-month patient death HR estimate**



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





## C. Transplant Information

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

Single organ transplants performed between 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Retransplants excluded

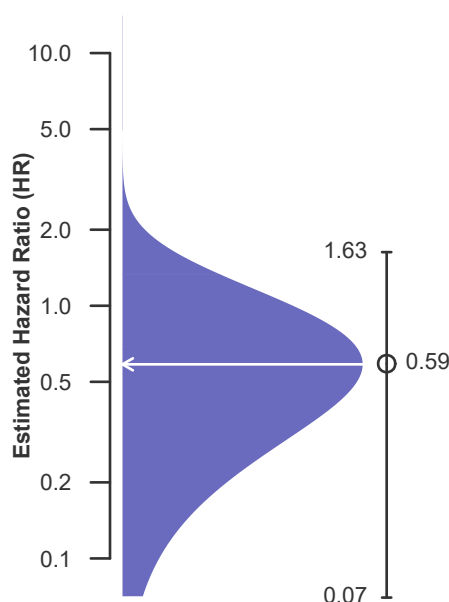
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	248	30,366
Estimated probability of surviving at 1 month (unadjusted for patient and donor characteristics)	100.00%	99.41%
Expected probability of surviving at 1 month (adjusted for patient and donor characteristics)	99.42%	--
Number of observed deaths during the first month after transplant	0	175
Number of expected deaths during the first month after transplant	1.41	--
Estimated hazard ratio*	0.59	--
95% credible interval for the hazard ratio**	[0.07, 1.63]	--

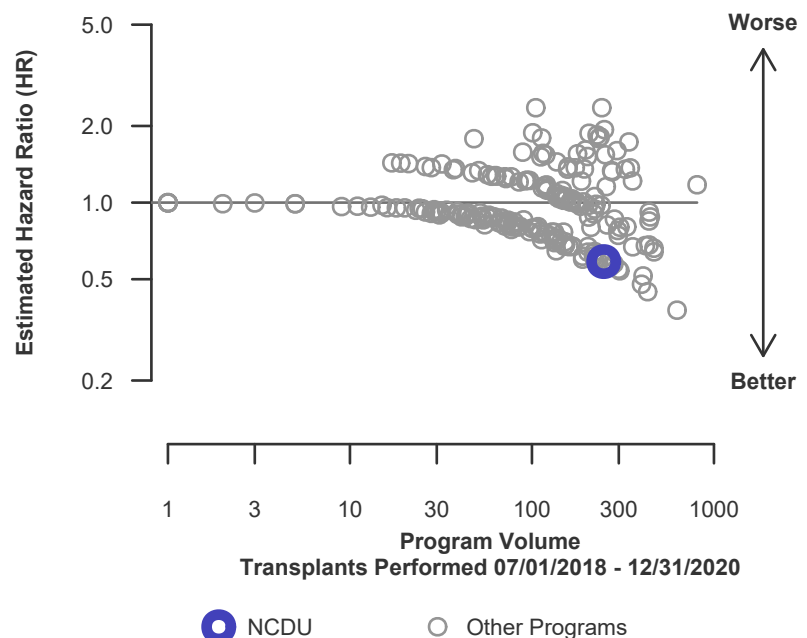
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, 1.63], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 41% lower risk of patient death compared to an average program, but NCDU's performance could plausibly range from 93% reduced risk up to 63% increased risk.

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



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





## C. Transplant Information

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

Single organ transplants performed between 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Retransplants excluded

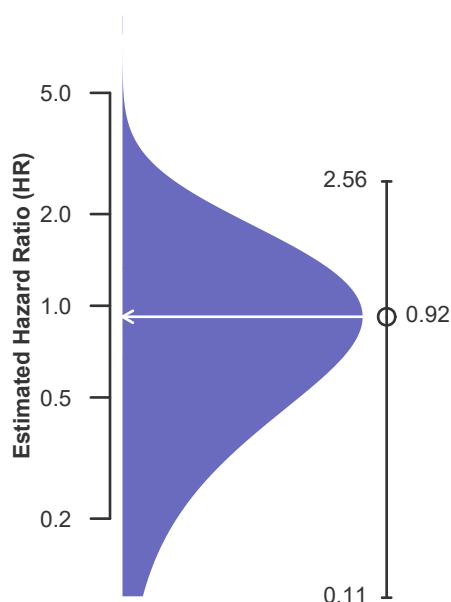
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	86	12,794
Estimated probability of surviving at 1 month (unadjusted for patient and donor characteristics)	100.00%	99.79%
Expected probability of surviving at 1 month (adjusted for patient and donor characteristics)	99.79%	--
Number of observed deaths during the first month after transplant	0	26
Number of expected deaths during the first month after transplant	0.17	--
Estimated hazard ratio*	0.92	--
95% credible interval for the hazard ratio**	[0.11, 2.56]	--

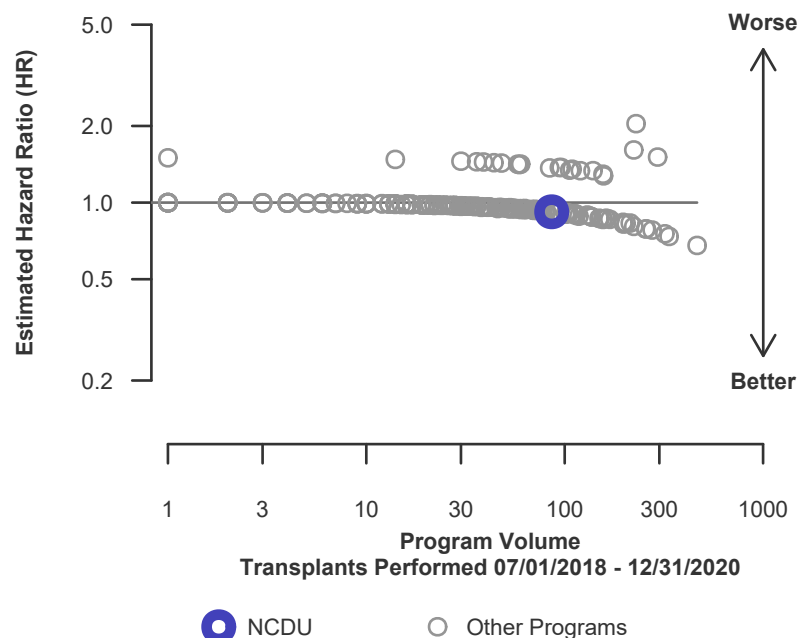
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.11, 2.56], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 8% lower risk of patient death compared to an average program, but NCDU's performance could plausibly range from 89% reduced risk up to 156% increased risk.

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



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





## C. Transplant Information

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

Single organ transplants performed between 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Retransplants excluded

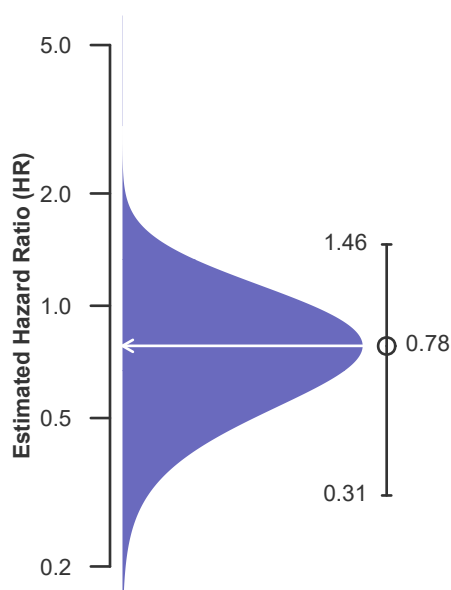
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	334	43,160
Estimated probability of surviving at 1 year (unadjusted for patient and donor characteristics)	97.09%	97.16%
Expected probability of surviving at 1 year (adjusted for patient and donor characteristics)	97.09%	--
Number of observed deaths during the first year after transplant	5	898
Number of expected deaths during the first year after transplant	6.97	--
Estimated hazard ratio*	0.78	--
95% credible interval for the hazard ratio**	[0.31, 1.46]	--

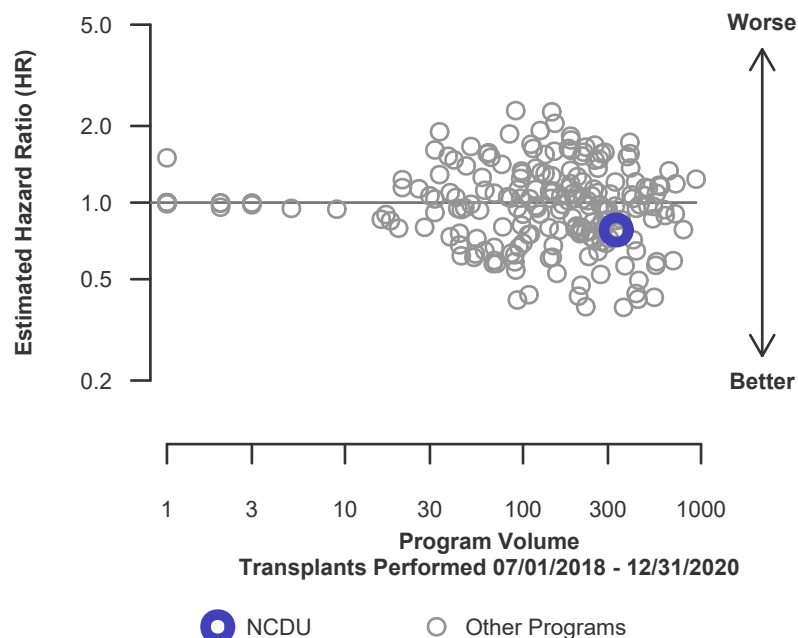
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.31, 1.46], 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 69% reduced risk up to 46% increased risk.

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



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





## C. Transplant Information

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

Single organ transplants performed between 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Retransplants excluded

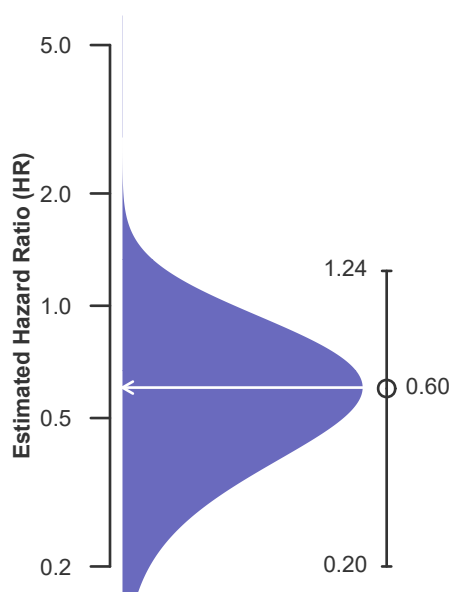
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	248	30,366
Estimated probability of surviving at 1 year (unadjusted for patient and donor characteristics)	97.88%	96.42%
Expected probability of surviving at 1 year (adjusted for patient and donor characteristics)	96.47%	--
Number of observed deaths during the first year after transplant	3	791
Number of expected deaths during the first year after transplant	6.29	--
Estimated hazard ratio*	0.60	--
95% credible interval for the hazard ratio**	[0.20, 1.24]	--

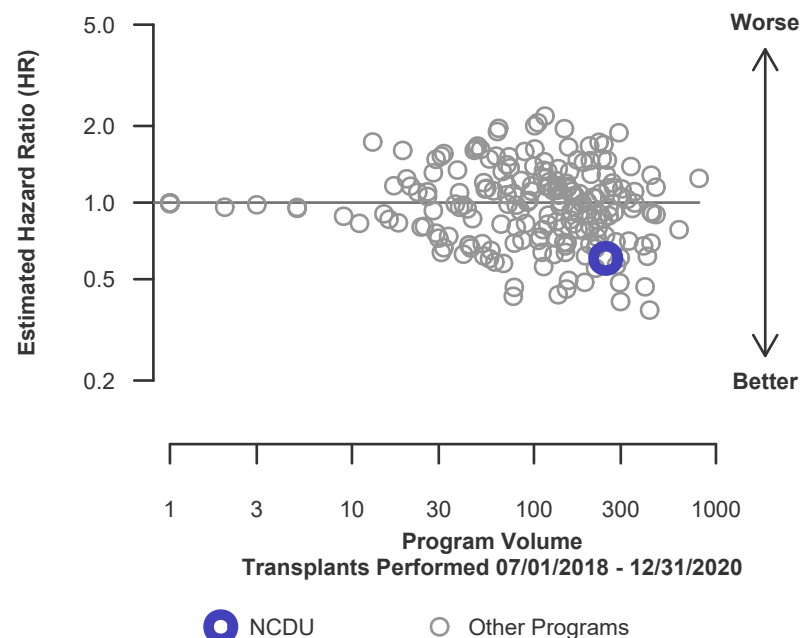
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.20, 1.24], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 40% lower risk of patient death compared to an average program, but NCDU's performance could plausibly range from 80% reduced risk up to 24% increased risk.

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



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







## C. Transplant Information

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

Single organ transplants performed between 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Retransplants excluded

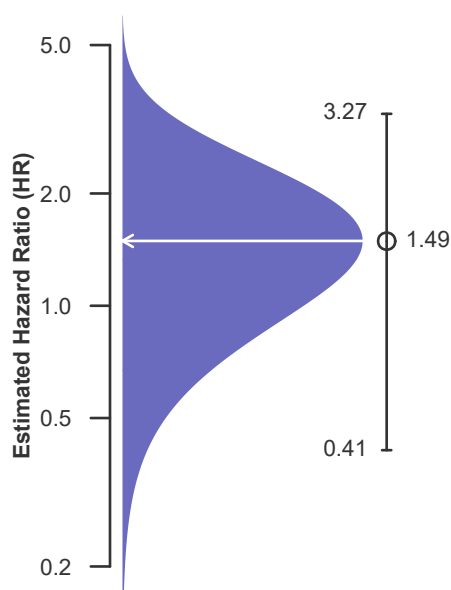
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	86	12,794
Estimated probability of surviving at 1 year (unadjusted for patient and donor characteristics)	94.46%	98.86%
Expected probability of surviving at 1 year (adjusted for patient and donor characteristics)	98.87%	--
Number of observed deaths during the first year after transplant	2	107
Number of expected deaths during the first year after transplant	0.68	--
Estimated hazard ratio*	1.49	--
95% credible interval for the hazard ratio**	[0.41, 3.27]	--

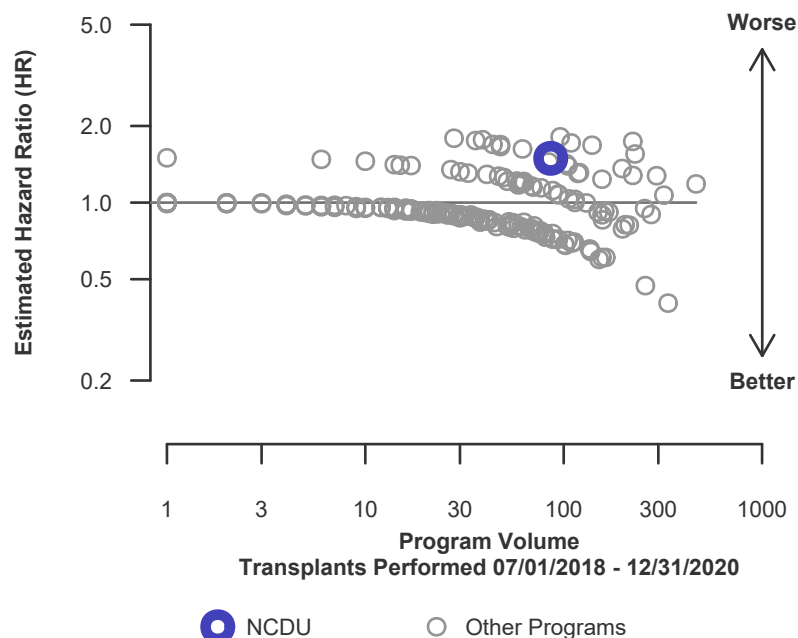
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.41, 3.27], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 49% higher risk of patient death compared to an average program, but NCDU's performance could plausibly range from 59% reduced risk up to 227% increased risk.

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



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







## C. Transplant Information

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

Single organ transplants performed between 01/01/2016 and 06/30/2018

Retransplants excluded

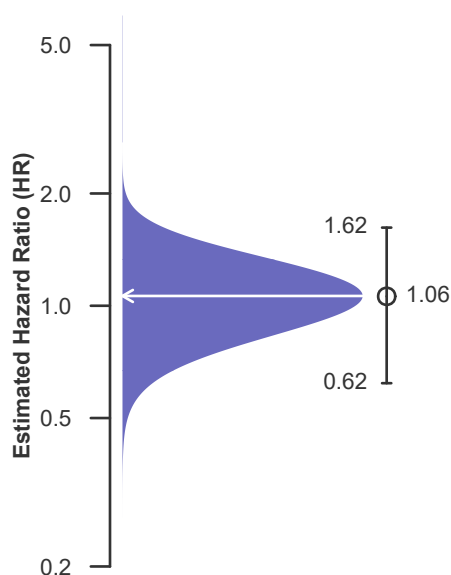
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	294	39,278
Estimated probability of surviving at 3 years (unadjusted for patient and donor characteristics)	94.39%	94.43%
Expected probability of surviving at 3 years (adjusted for patient and donor characteristics)	94.73%	--
Number of observed deaths during the first 3 years after transplant	15	1,947
Number of expected deaths during the first 3 years after transplant	14.00	--
Estimated hazard ratio*	1.06	--
95% credible interval for the hazard ratio**	[0.62, 1.62]	--

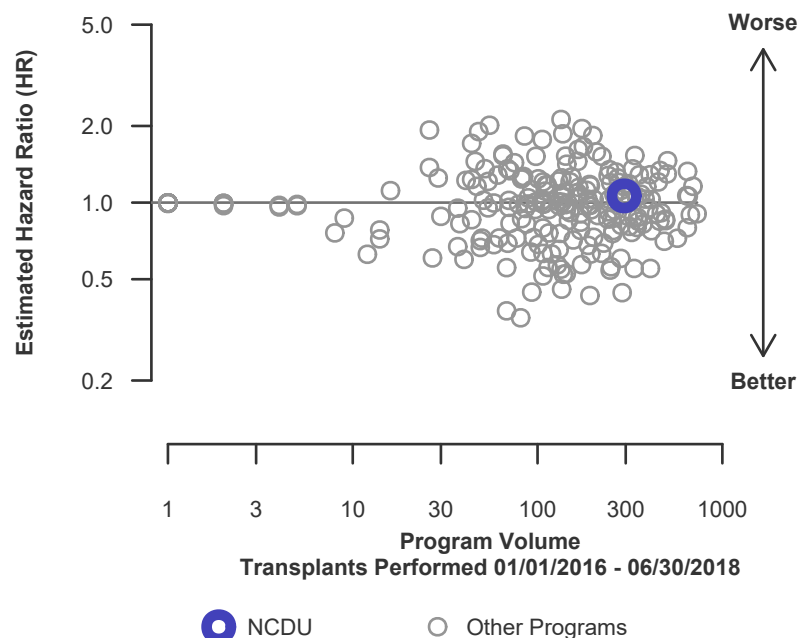
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.62, 1.62], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 6% higher risk of patient death compared to an average program, but NCDU's performance could plausibly range from 38% reduced risk up to 62% 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 01/01/2016 and 06/30/2018

Retransplants excluded

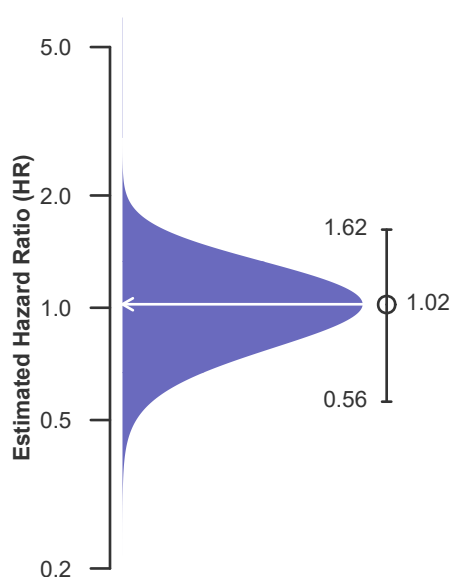
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	203	26,758
Estimated probability of surviving at 3 years (unadjusted for patient and donor characteristics)	93.93%	93.13%
Expected probability of surviving at 3 years (adjusted for patient and donor characteristics)	93.72%	--
Number of observed deaths during the first 3 years after transplant	12	1,648
Number of expected deaths during the first 3 years after transplant	11.70	--
Estimated hazard ratio*	1.02	--
95% credible interval for the hazard ratio**	[0.56, 1.62]	--

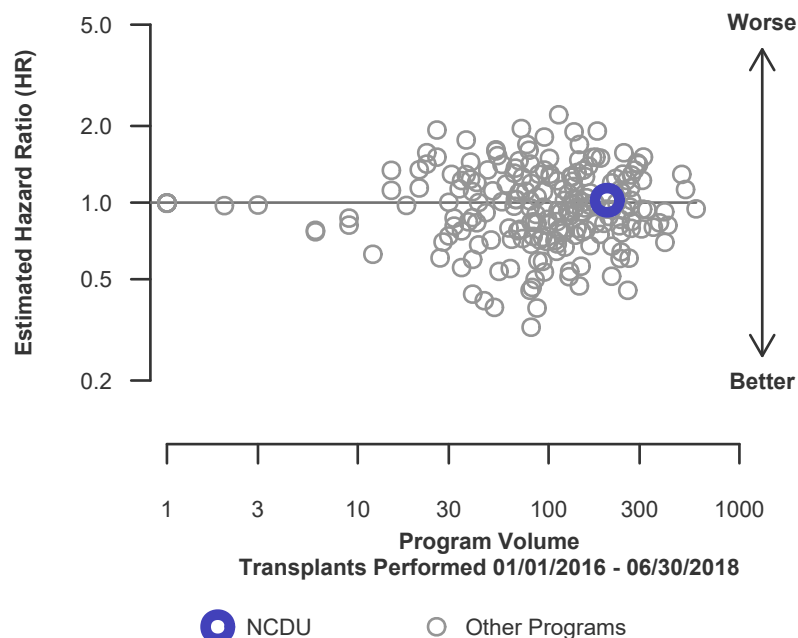
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.56, 1.62], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 2% higher risk of patient death compared to an average program, but NCDU's performance could plausibly range from 44% reduced risk up to 62% increased risk.

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



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





## C. Transplant Information

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

Single organ transplants performed between 01/01/2016 and 06/30/2018

Retransplants excluded

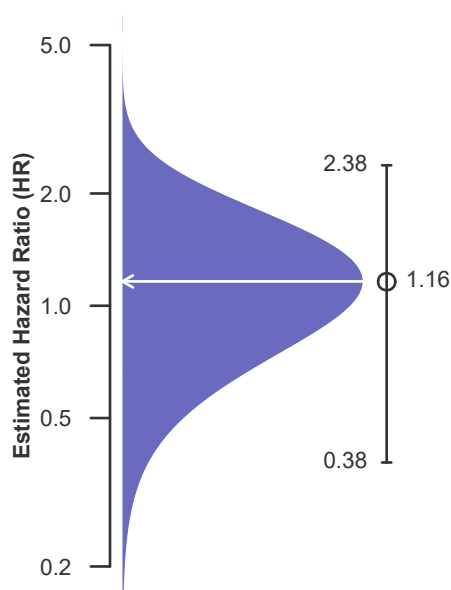
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	91	12,520
Estimated probability of surviving at 3 years (unadjusted for patient and donor characteristics)	95.11%	97.21%
Expected probability of surviving at 3 years (adjusted for patient and donor characteristics)	97.01%	--
Number of observed deaths during the first 3 years after transplant	3	299
Number of expected deaths during the first 3 years after transplant	2.30	--
Estimated hazard ratio*	1.16	--
95% credible interval for the hazard ratio**	[0.38, 2.38]	--

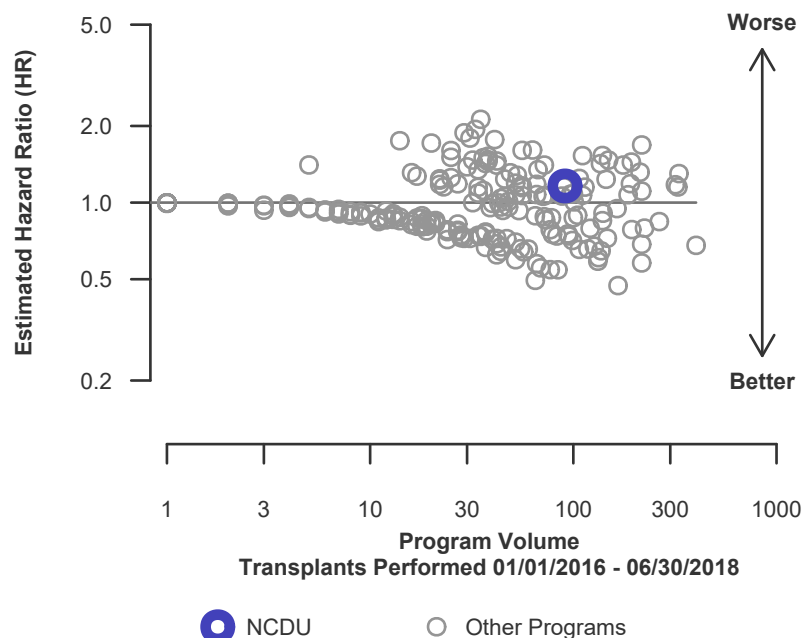
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, 2.38], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 16% higher risk of patient death compared to an average program, but NCDU's performance could plausibly range from 62% reduced risk up to 138% increased risk.

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



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





## C. Transplant Information

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

Single organ transplants performed between 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Retransplants excluded

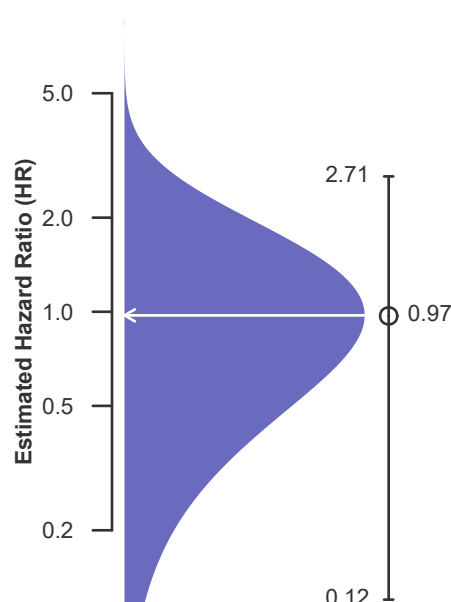
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	13	1,767
Estimated probability of surviving at 1 month (unadjusted for patient and donor characteristics)	100.00%	99.71%
Expected probability of surviving at 1 month (adjusted for patient and donor characteristics)	99.59%	--
Number of observed deaths during the first month after transplant	0	5
Number of expected deaths during the first month after transplant	0.05	--
Estimated hazard ratio*	0.97	--
95% credible interval for the hazard ratio**	[0.12, 2.71]	--

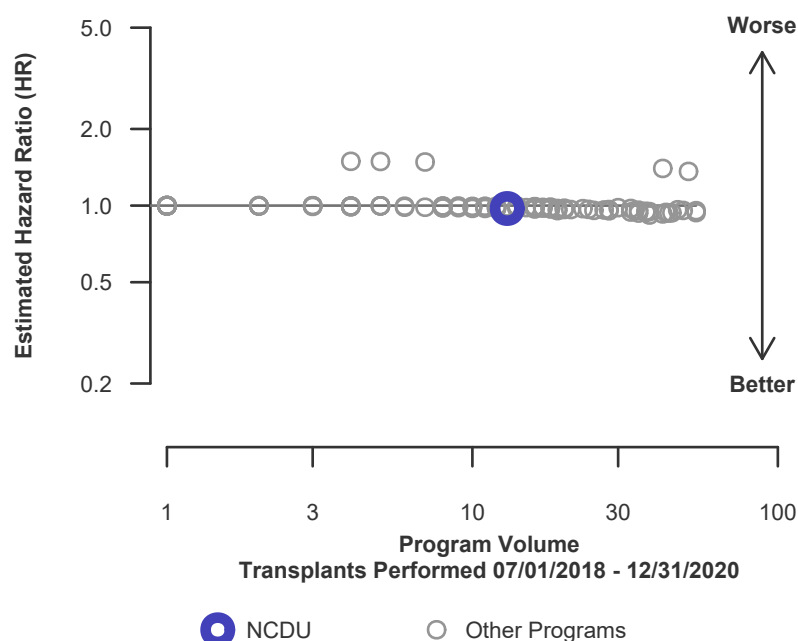
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, 2.71], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 3% lower risk of patient death compared to an average program, but NCDU's performance could plausibly range from 88% reduced risk up to 171% 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 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Retransplants excluded

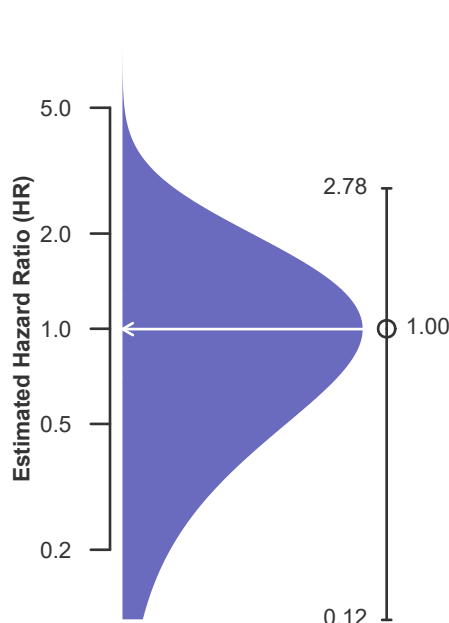
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	6	1,180
Estimated probability of surviving at 1 month (unadjusted for patient and donor characteristics)	100.00%	99.92%
Expected probability of surviving at 1 month (adjusted for patient and donor characteristics)	99.92%	--
Number of observed deaths during the first month after transplant	0	1
Number of expected deaths during the first month after transplant	0.01	--
Estimated hazard ratio*	1.00	--
95% credible interval for the hazard ratio**	[0.12, 2.78]	--

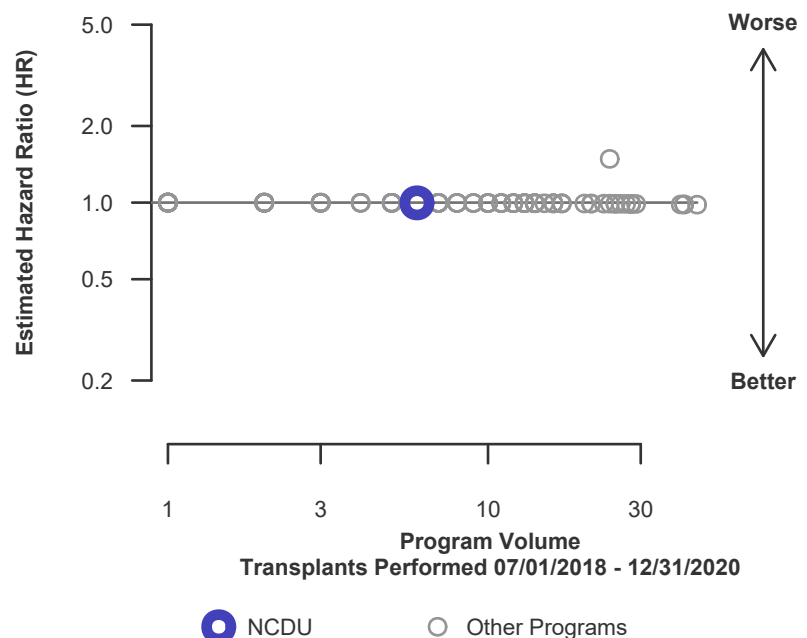
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, 2.78], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 0% lower risk of patient death compared to an average program, but NCDU's performance could plausibly range from 88% reduced risk up to 178% 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 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Retransplants excluded

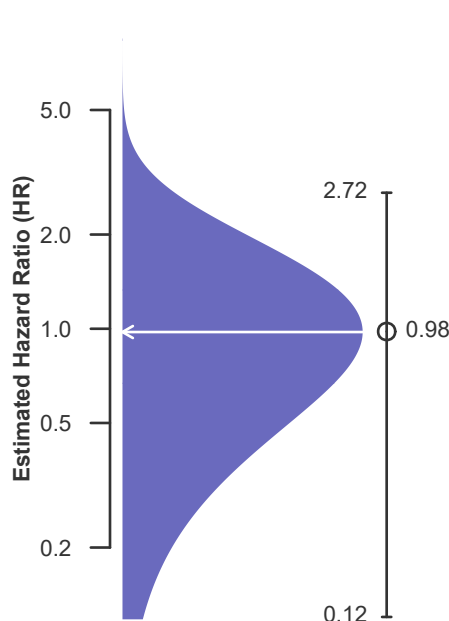
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	7	587
Estimated probability of surviving at 1 month (unadjusted for patient and donor characteristics)	100.00%	99.31%
Expected probability of surviving at 1 month (adjusted for patient and donor characteristics)	99.31%	--
Number of observed deaths during the first month after transplant	0	4
Number of expected deaths during the first month after transplant	0.05	--
Estimated hazard ratio*	0.98	--
95% credible interval for the hazard ratio**	[0.12, 2.72]	--

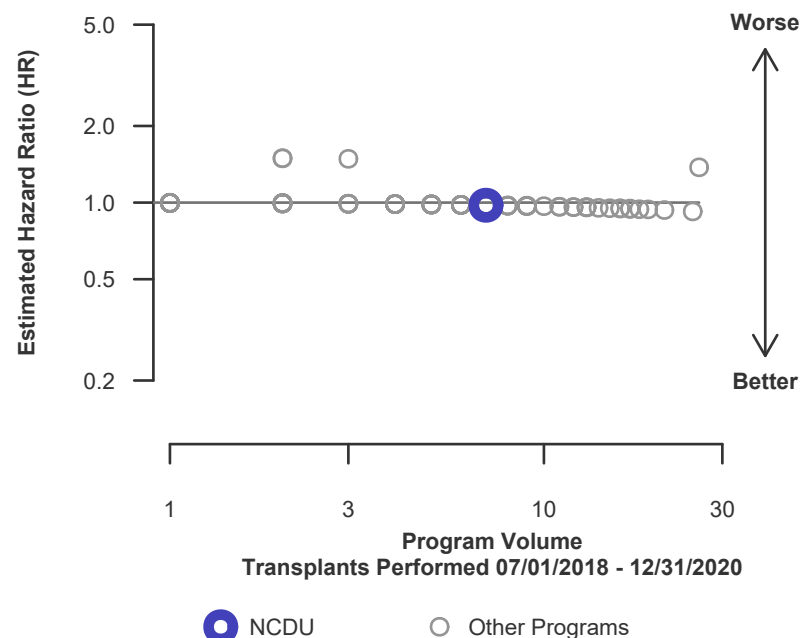
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, 2.72], 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 172% 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 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Retransplants excluded

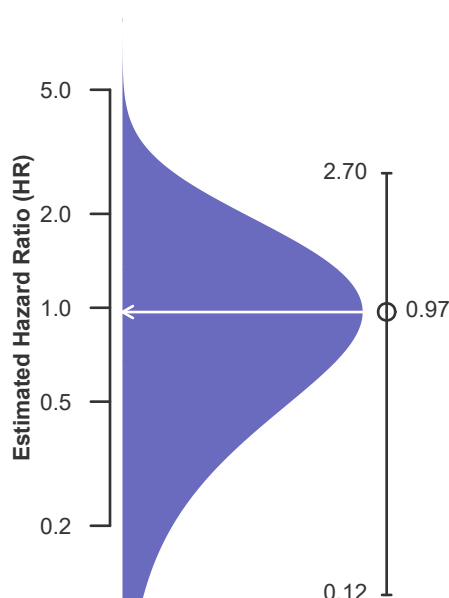
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	13	1,767
Estimated probability of surviving at 1 year (unadjusted for patient and donor characteristics)	100.00%	99.40%
Expected probability of surviving at 1 year (adjusted for patient and donor characteristics)	99.37%	--
Number of observed deaths during the first year after transplant	0	8
Number of expected deaths during the first year after transplant	0.06	--
Estimated hazard ratio*	0.97	--
95% credible interval for the hazard ratio**	[0.12, 2.70]	--

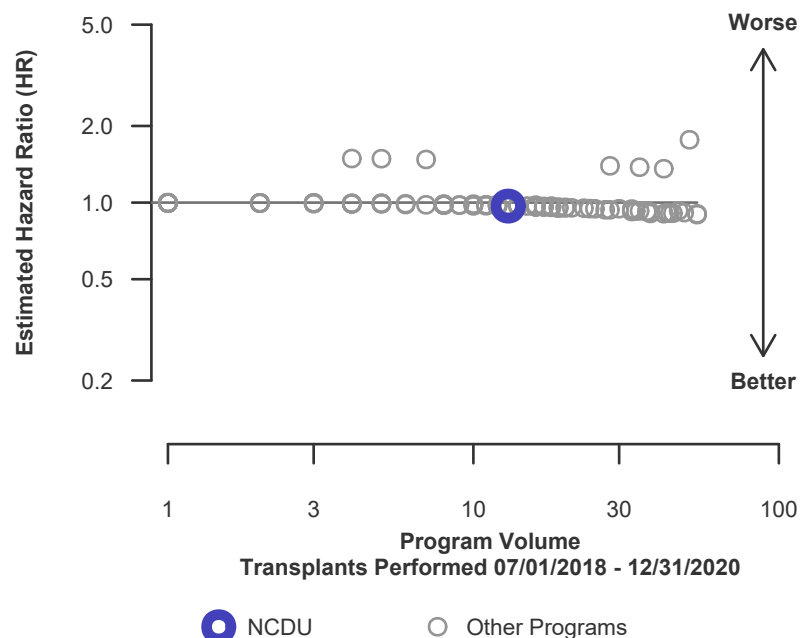
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, 2.70], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 3% lower risk of patient death compared to an average program, but NCDU's performance could plausibly range from 88% reduced risk up to 170% 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 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Retransplants excluded

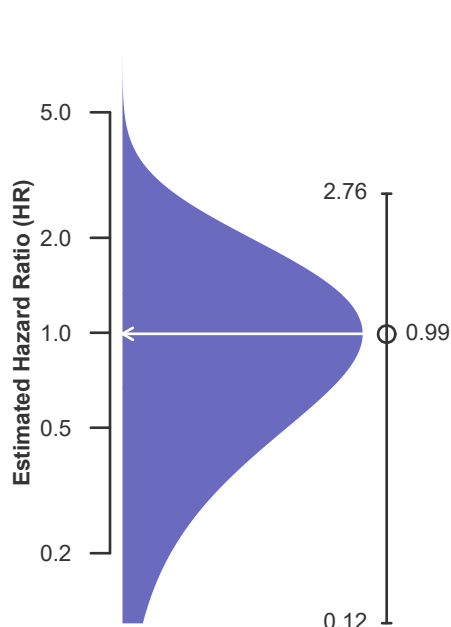
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	6	1,180
Estimated probability of surviving at 1 year (unadjusted for patient and donor characteristics)	100.00%	99.45%
Expected probability of surviving at 1 year (adjusted for patient and donor characteristics)	99.45%	--
Number of observed deaths during the first year after transplant	0	4
Number of expected deaths during the first year after transplant	0.02	--
Estimated hazard ratio*	0.99	--
95% credible interval for the hazard ratio**	[0.12, 2.76]	--

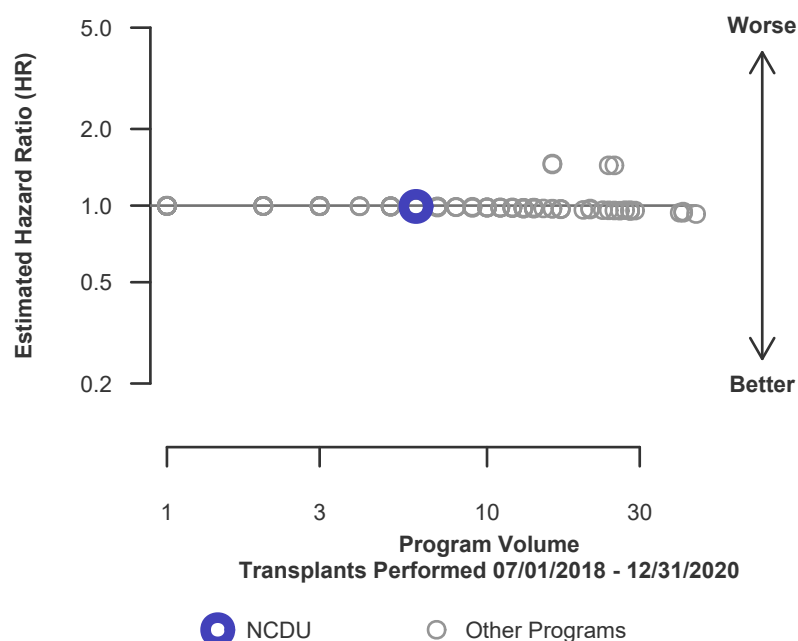
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, 2.76], 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 176% 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 07/01/2018 and 03/12/2020, and 06/13/2020 and 12/31/2020

Retransplants excluded

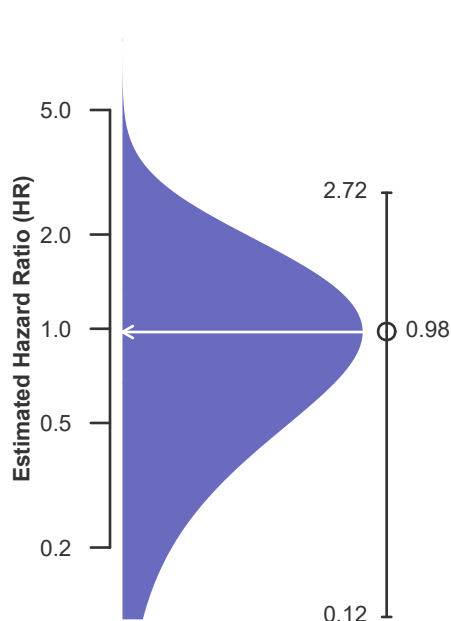
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	7	587
Estimated probability of surviving at 1 year (unadjusted for patient and donor characteristics)	100.00%	99.31%
Expected probability of surviving at 1 year (adjusted for patient and donor characteristics)	99.31%	--
Number of observed deaths during the first year after transplant	0	4
Number of expected 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]	--

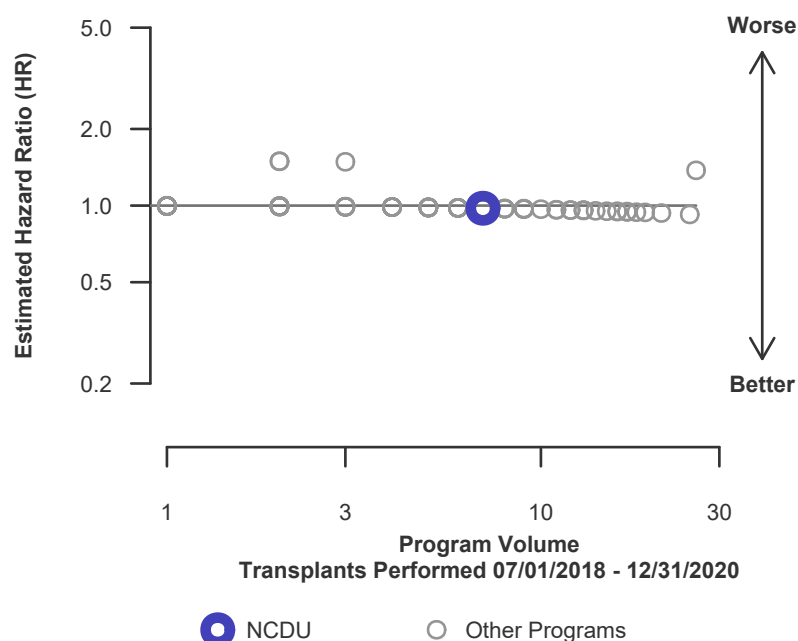
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, 2.72], 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 172% 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 01/01/2016 and 06/30/2018

Retransplants excluded

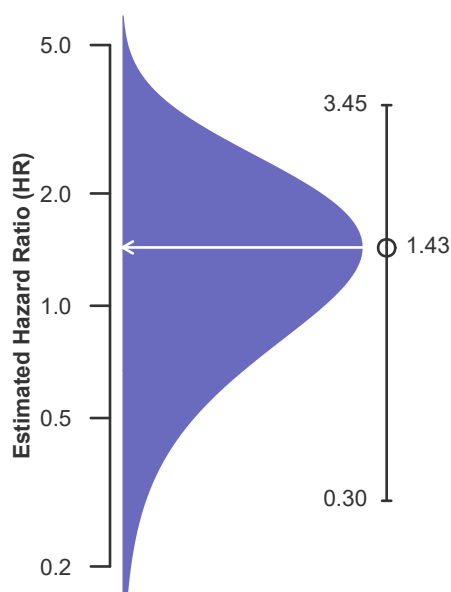
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	10	1,874
Estimated probability of surviving at 3 years (unadjusted for patient and donor characteristics)	80.00%	98.93%
Expected probability of surviving at 3 years (adjusted for patient and donor characteristics)	98.96%	--
Number of observed deaths during the first 3 years after transplant	1	18
Number of expected deaths during the first 3 years after transplant	0.09	--
Estimated hazard ratio*	1.43	--
95% credible interval for the hazard ratio**	[0.30, 3.45]	--

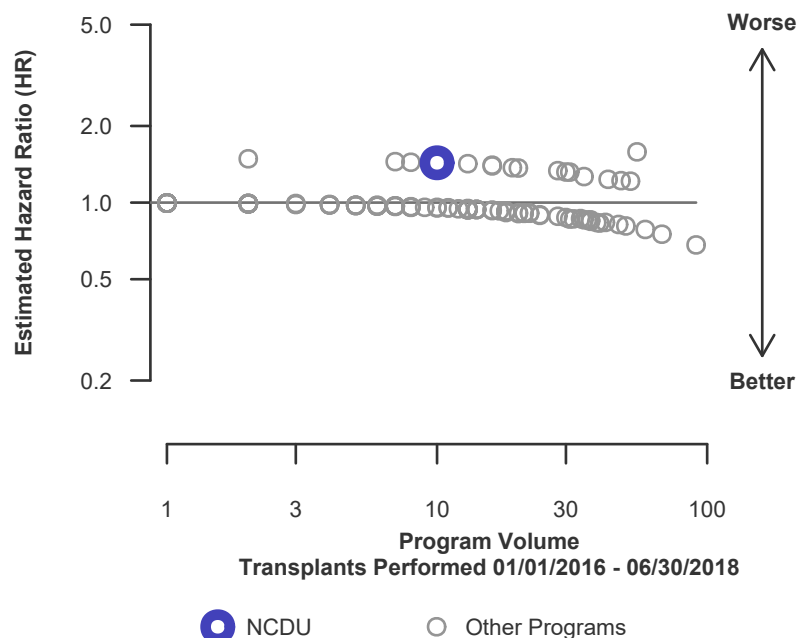
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.30, 3.45], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 43% higher risk of patient death compared to an average program, but NCDU's performance could plausibly range from 70% reduced risk up to 245% 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 01/01/2016 and 06/30/2018

Retransplants excluded

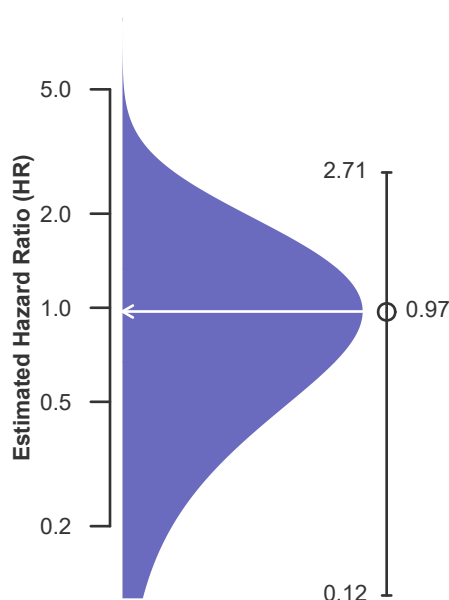
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	5	1,262
Estimated probability of surviving at 3 years (unadjusted for patient and donor characteristics)	100.00%	98.88%
Expected probability of surviving at 3 years (adjusted for patient and donor characteristics)	98.88%	--
Number of observed deaths during the first 3 years after transplant	0	13
Number of expected deaths during the first 3 years after transplant	0.06	--
Estimated hazard ratio*	0.97	--
95% credible interval for the hazard ratio**	[0.12, 2.71]	--

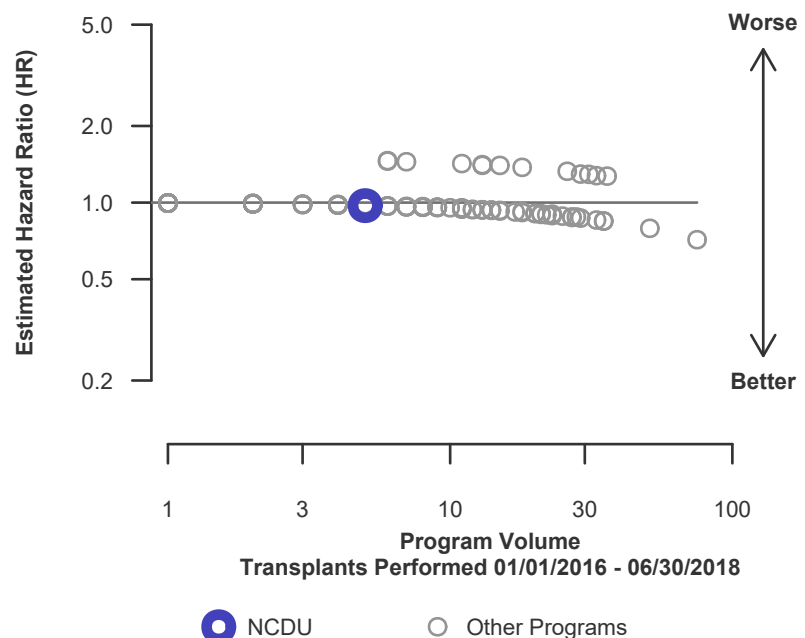
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, 2.71], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 3% lower risk of patient death compared to an average program, but NCDU's performance could plausibly range from 88% reduced risk up to 171% 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 01/01/2016 and 06/30/2018

Retransplants excluded

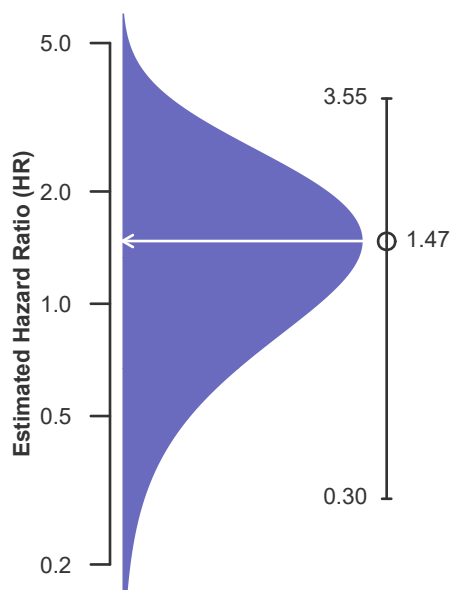
Follow-up ends on 3/12/2020 for recipients transplanted prior to 3/13/2020

	NCDU	U.S.
Number of transplants evaluated	5	612
Estimated probability of surviving at 3 years (unadjusted for patient and donor characteristics)	0.00%	99.04%
Expected probability of surviving at 3 years (adjusted for patient and donor characteristics)	99.04%	--
Number of observed deaths during the first 3 years after transplant	1	5
Number of expected deaths during the first 3 years after transplant	0.04	--
Estimated hazard ratio*	1.47	--
95% credible interval for the hazard ratio**	[0.30, 3.55]	--

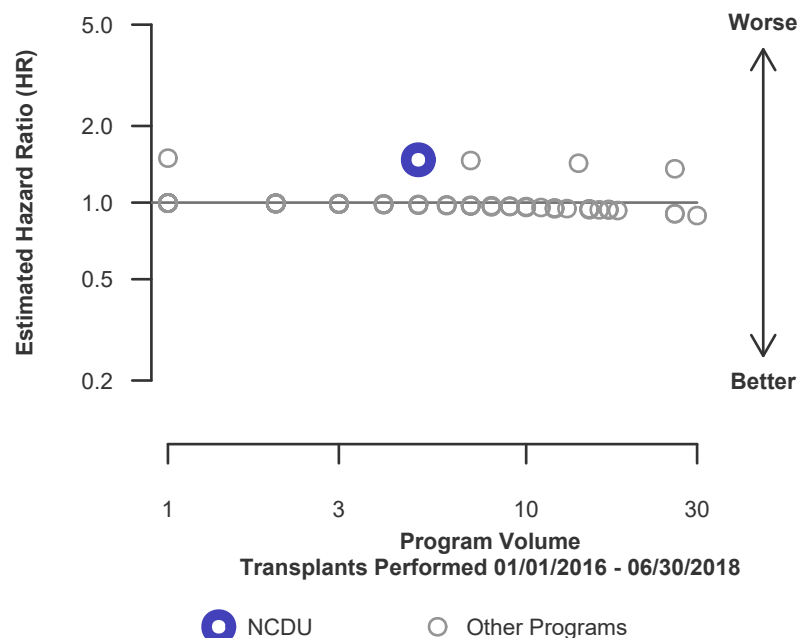
\* The hazard ratio provides an estimate of how Duke University Hospital's results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected patient death rates (e.g., a hazard ratio of 1.5 would indicate 50% higher 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, [0.30, 3.55], indicates the location of NCDU's true hazard ratio with 95% probability. The best estimate is 47% higher risk of patient death compared to an average program, but NCDU's performance could plausibly range from 70% reduced risk up to 255% 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: 07/01/2018 - 12/31/2020

### Adult (18+) Transplants

Transplant Type	First-Year Outcomes					
	Transplants Performed		Kidney Graft Failures		Estimated Kidney Graft Survival	
	NCDU-TX1	USA	NCDU-TX1	USA	NCDU-TX1	USA
Kidney-Heart	18	609	6	95	65.0%	84.0%
Kidney-Liver	23	1,803	4	202	80.6%	88.3%
Kidney Lung	3	28	1	6	66.7%	77.1%
Kidney-Pancreas-Liver-Intestine	1	6	0	2	100.0%	62.5%
Kidney-Pancreas	8	2,110	0	93	100.0%	95.3%

### Pediatric (<18) Transplants

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

Table C18. Multi-organ transplant patient survival: 07/01/2018 - 12/31/2020

### 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-Heart	18	609	2	71	88.9%	88.0%
Kidney-Liver	23	1,803	4	165	80.6%	90.3%
Kidney Lung	3	28	1	6	66.7%	77.1%
Kidney-Pancreas-Liver-Intestine	1	6	0	2	100.0%	62.5%
Kidney-Pancreas	8	2,110	0	62	100.0%	96.8%

### Pediatric (<18) Transplants

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



## D. Living Donor Information

Table D1. Living donor summary: 07/01/2018 - 06/30/2021

Living Donor Follow-Up	This Center			United States		
	07/2018- 06/2019	07/2019- 06/2020	07/2020- 12/2020	07/2018- 06/2019	07/2019- 06/2020	07/2020- 12/2020
<b>Number of Living Donors</b>	42	48	18	6,686	5,782	2,939
<b>6-Month Follow-Up</b>						
Donors due for follow-up	42	14	10	6,682	1,463	1,391
Timely clinical data	39 92.9%	14 100.0%	10 100.0%	5,837 87.4%	1,239 84.7%	1,227 88.2%
Timely lab data	36 85.7%	13 92.9%	9 90.0%	5,638 84.4%	1,138 77.8%	1,172 84.3%
<b>12-Month Follow-Up</b>						
Donors due for follow-up	24	6		4,628	921	
Timely clinical data	24 100.0%	6 100.0%		3,813 82.4%	752 81.7%	
Timely lab data	23 95.8%	6 100.0%		3,543 76.6%	715 77.6%	
<b>24-Month Follow-Up</b>						
Donors due for follow-up	15			1,748		
Timely clinical data	14 93.3%			1,338 76.5%		
Timely lab data	12 80.0%			1,220 69.8%		

Follow-up forms due during the COVID-19 amnesty period from 3/13/2020-3/31/2021 are not included in timely clinical and lab data calculations