Final Report

OPTN Heart Committee | Descriptive Data Request

Two-Year Heart Monitoring Report
Eliminate the Use of DSAs in Thoracic Distribution

DHHS Contract No. 250-2019-00001C
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Heart Committee
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Background/Purpose

Allocation of hearts and heart-lungs historically used Donor Service Area (DSA) as a geographic unit of distribution for both pediatric and adult heart candidates. Due to the different sizes, shapes and populations of DSAs, this would sometimes result in hearts or heart-lungs being transplanted farther away when there was a candidate of similar medical urgency closer to the donor hospital.

During the summer of 2018, the Organ Procurement and Transplantation Network (OPTN) Executive Committee directed the organ-specific committees to remove DSAs and OPTN regions from their allocation systems and replace them with a rationally determined substitute that could be consistently applied and was legally defensible by way of better alignment with the Final Rule.

The OPTN Thoracic Organ Transplantation Committee proposed replacing DSA with a 250 nautical mile (NM) distance from the donor hospital. Since the implementation of this proposal, the OPTN Thoracic Organ Transplantation Committee split into the Lung Transplantation Committee and the Heart Transplantation Committee (hereafter referred to as The Committee). The Committee will continue monitoring the removal of DSA from heart allocation policy.

The goal of the removal of DSA from allocation was to make heart allocation policy consistent with the Final Rule and provide improved equity in access to transplantation regardless of a candidate's place of listing. In addition, this proposal implemented on January 09, 2020 realigned the first units of distribution for heart and lung allocation, addressed the limited utility of the exception for sensitized heart candidates, and resolved several clerical artifacts that remained as a consequence of removing DSA as a unit of distribution from heart allocation policy.

This report looks at the impact of the removal of DSA as a unit of allocation two years post-policy implementation.

Strategic Plan Goal or Committee Project Addressed

Improve equity in access to heart transplants

Committee Request

As outlined in the monitoring plan in the proposal, the Committee will monitor metrics as they relate to the proposed geographic changes regarding the removal of DSA from heart allocation. This includes, but is not limited to:

1. The number/% of transplants stratified by distance (NM) between donor hospital and transplant center
2. Volume of transplants by de-identified heart transplant centers
3. Distribution of the distance (NM) between donor hospital and transplant center, including range, IQR, mean, and median
4. Number and percent of transplants by geographic classification (local, regional, national) and distance (NM) between donor hospital and transplant center
5. Distribution of ischemic time (hours) for heart transplants, including range, IQR, mean, and median
6. Unadjusted post-transplant patient survival stratified by distance (NM) between donor hospital and transplant center

Metric 6, above, was omitted in the 3-month and 6-month reports due to insufficient time having passed to draw conclusions. It was presented in the 1-year report and is presented in this final 2-year report as well.

Data and Methods

Data Sources: These analyses use data from the OPTN waiting list, the Deceased Donor Registration (DDR) form, the Transplant Candidate Registration (TCR) form, and the Transplant Recipient Registration (TRR) form.

Analyses are based on OPTN data as of August 12, 2022 and are subject to change based on future data submission or correction.

Methods:

Adult (age >= 18 at listing) and pediatric (age < 18 at listing) candidates added to the heart waiting list between January 08, 2019 and January 08, 2020 (pre) or between January 09, 2020 and January 08, 2022 (post) were stratified by medical urgency status, region, and medical urgency status within region. A one year pre-policy period was used to avoid confounding that may have arisen due to the October 2018 adult heart policy change.

Snapshot data provide a summary of candidates on the waiting list on the last day of a given month. Snapshot data are provided for two eras (pre-policy, post-policy) and summaries reflect the waiting list on the last day of the first month of the period. Snapshot data were stratified by medical urgency status.

Candidates removed from the waiting list between January 08, 2019 and January 08, 2020 (pre) or between January 09, 2020 and January 08, 2022 (post) were stratified by era, medical urgency status within era, and reason for removal.

Candidates ever waiting between January 08, 2019 and January 08, 2020 (pre) or between January 09, 2020 and January 08, 2022 (post) were stratified by medical urgency status and region. The distribution of medical urgency status for candidates ever waiting was further stratified by whether the listing center performed more or fewer transplants post-implementation than pre-implementation, and the distributions were compared using the Chi-squared test.

Waiting list mortality rates and transplant rates were calculated based on a cohort of adult (age >= 18) candidates ever waiting only on the heart waiting list between between January 08, 2019 and January 08, 2020 (pre) or between January 09, 2021 and January 08, 2022 (second year post). Post-policy mortality and transplant rates were restricted to the second year post-policy to ensure that the ever-waiting cohorts were of the same duration and occurred during a similar season. Note that waiting list mortality rates and transplant rates for the first year post-policy were presented in the 1-year monitoring report. Rates were calculated as the ratio of death or transplant to patient-years of exposure, and are displayed as deaths or transplants per 100 patient-years. The OPTN database was supplemented with deaths from verified external sources. Since candidates may be removed from the waiting list shortly prior to death as their health deteriorates, the waiting list mortality rate calculation included deaths within seven days of waiting list removal and those removed from the waiting list as a result of becoming too sick to transplant. Candidates who received any previous transplant were excluded from the waiting list mortality and transplant rate analyses.

Deceased donor heart recipients transplanted between January 08, 2019 and January 08, 2020 (pre) or between January 09, 2020 and January 08, 2022 (post) were stratified by medical urgency status, region, medical urgency status within region, zone, share type, distance traveled to transplant, and geographic region. Total ischemic time at transplant was compared across eras using Student's t-test, while distance traveled to transplant was compared across eras using the Wilcoxon rank-sum test.

Electronic offer data for adult (age >= 18) deceased donors recovered between January 08, 2019 and January 08, 2020 (pre) or between January 09, 2020 and January 08, 2022 (post) were used to assess the time between first electronic offer and cross clamp and the sequence number of the acceptor on adult heart match runs. The distribution of the offer number on heart match runs was summarized using the median, 10th percentile, and 90th percentile.

Outcomes analyses were performed on a subset of adult heart transplant recipients with the potential for at least one year of follow-up plus a three-month data lag, which included recipients transplanted between January 08, 2019 and January 08, 2020 in the pre-implementation cohort and between January 09, 2020 and January 08, 2021 in the post-implementation cohort. Candidates who received any previous transplant were excluded from the analysis, as were multi-organ transplant candidates. Standard Kaplan-Meier survival analyses were conducted, as 1) the OPTN Executive Committee's amnesty policy that temporarily relaxed reporting requirements for follow-up form submission during the height of COVID-19 is no longer in effect, and 2) we expect that any outcomes censoring that may have been seen as a result of this policy have been resolved. Survival curves were constructed using unadjusted Kaplan-Meier methodology and compared using the log-rank test.

Utilization and discard rates were calculated for a cohort of deceased donors recovered between January 08, 2019 and January 08, 2020 (pre) or between January 09, 2021 and January 08, 2022 (second year post). Post-policy utilization and discard rates were restricted to the second year post-policy to ensure that donor cohorts were of the same duration and occurred during a similar season. Note that utilization and discard rates for the first year post-policy were presented in the 1-year monitoring report. Utilization rate was defined as the number of deceased donor hearts transplanted divided by the total number of deceased donors recovered. The discard rate was defined as one minus the number of adult deceased donor hearts transplanted divided by the total number of adult deceased donor hearts recovered in that period.

Statistical analyses were performed using SAS v9.3 (SAS Institute, Inc., Cary, NC.) and R Version 4.1.3 (R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL: https://www.R-project.org/).

A Notice on COVID

For all figures and tables, we note that the World Health Organization (WHO) declared COVID-19 a pandemic on March 11, 2020 and a national state of emergency was declared in the U.S. on March 13, 2020. This report contains 22 months of COVID-era data in the post-policy era since the declaration of this national emergency. Given the impact that has been seen on the U.S. transplant and donation community (see data trends at unos.org/covid) the true impact of this policy change is very challenging to determine.

Results

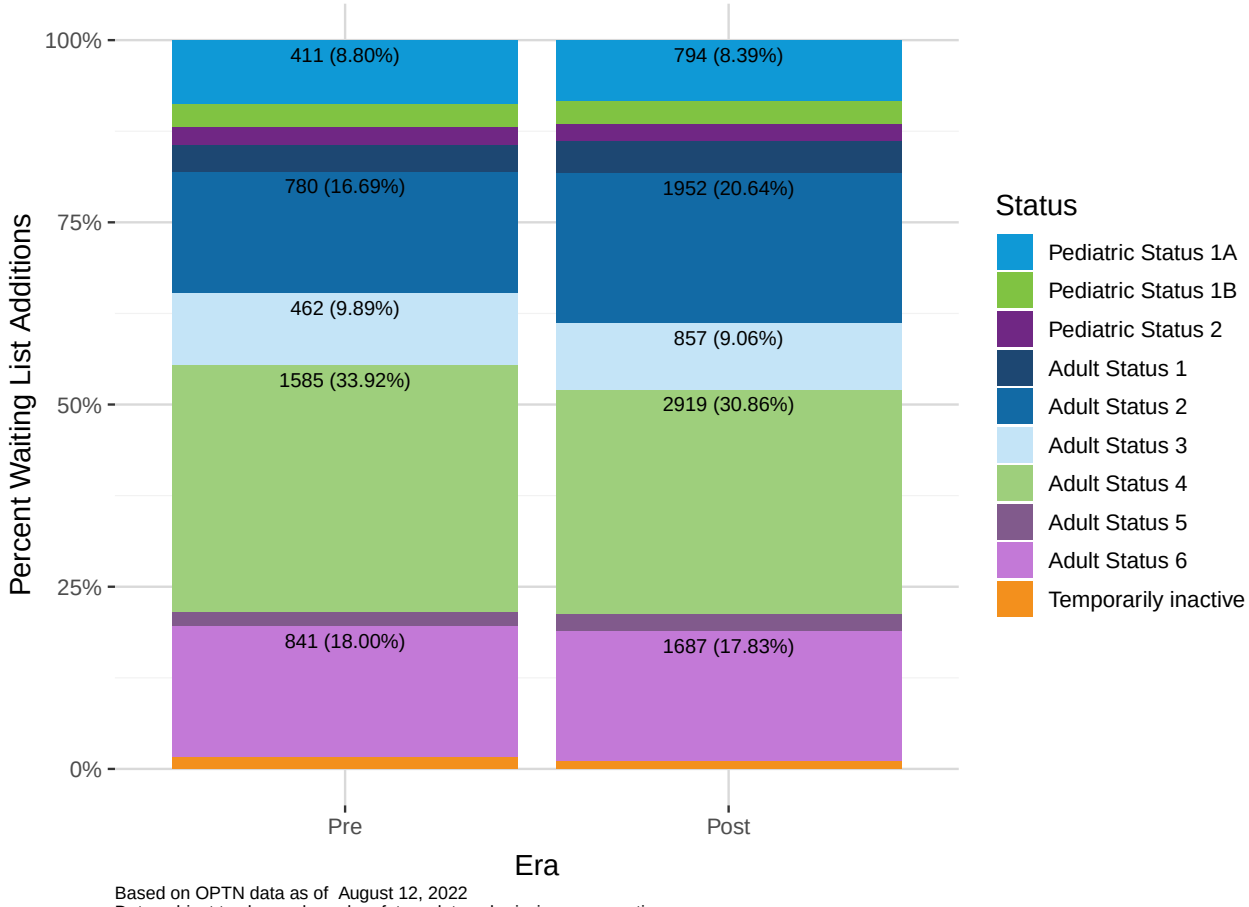
Waitlist

The analyses in this chapter describe the differences in waitlist additions and candidates ever-waiting between the pre-implementation and post-implementation cohorts. Where possible the full two-year post-implementation cohort was used.

Pre-implementation there were 4673 registrations added to the heart waiting list between January 08, 2019 and January 08, 2020. Of these, 691 registrations were pediatric registrations and 3982 registrations were adult registrations pre-implementation. A total of 9459 registrations were added post-implementation between January 09, 2020 and January 08, 2022, with 4517 of these additions occurring in the first year post-implementation and 4942 of these additions occurring in the second year post-implementation). The first year post-implementation included 642 pediatric registrations and 3875 adult registrations; the second year post-implementation included 696 pediatric registrations and 4246 adult registrations.

Figure 1 and Table 1 show the proportion and counts of heart waitlist additions by era and medical urgency status. Note that because the post-implementation cohort was twice the length of the pre-implementation cohort, counts are higher in the post-implementation cohort. However, the proportions of waitlist additions in different medical urgency statuses were similar across eras. There was a slight decrease in the proportion of Adult Status 4 registrations and a slight increase in the proportion of Adult Status 2 registrations post-implementation.

Figure 1. Heart Waiting List Additions by Medical Urgency Status and Era



Based on OPTN data as of August 12, 2022
Data subject to change based on future data submission or correction
Statuses representing less than 5% of the total are not labeled on the plot

Table 1. Heart Waiting List Additions by Medical Urgency Status and Era

	Pre-Policy		Post-Policy (Year 1)		Post-Policy (Year 2)		Post-Policy (Overall)	
Status	N	%	N	%	N	%	N	%
Pediatric Status 1A	411	8.8%	389	8.6%	405	8.2%	794	8.4%
Pediatric Status 1B	148	3.2%	138	3.1%	155	3.1%	293	3.1%
Pediatric Status 2	118	2.5%	105	2.3%	127	2.6%	232	2.5%
Adult Status 1	167	3.6%	174	3.9%	235	4.8%	409	4.3%
Adult Status 2	780	16.7%	870	19.3%	1082	21.9%	1952	20.6%
Adult Status 3	462	9.9%	443	9.8%	414	8.4%	857	9.1%
Adult Status 4	1585	33.9%	1387	30.7%	1532	31%	2919	30.9%
Adult Status 5	87	1.9%	96	2.1%	119	2.4%	215	2.3%
Adult Status 6	841	18%	859	19%	828	16.8%	1687	17.8%
Temporarily inactive	74	1.6%	56	1.2%	45	0.9%	101	1.1%

Based on OPTN data as of August 12, 2022

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Table 2 shows a snapshot of the heart waitlist at the end of the first month of each period. Snapshots show the makeup of the waitlist as of a particular date. The proportions of candidates waiting at each medical urgency status remained fairly similar across snapshots.

Table 2. Heart Waiting List on Last Day of First Month of Each Period by Medical Urgency Status

	Pre-Policy		Post-Policy (Year 1)		Post-Policy (Year 2)	
Status	**N**	**%**	**N**	**%**	**N**	**%**
Pediatric Status 1A	88	3.1%	86	3%	112	4.3%
Pediatric Status 1B	70	2.4%	80	2.8%	85	3.2%
Pediatric Status 2	118	4.1%	125	4.4%	110	4.2%
Adult Status 1	6	0.2%	2	0.1%	6	0.2%
Adult Status 2	59	2.1%	88	3.1%	91	3.5%
Adult Status 3	218	7.6%	210	7.4%	164	6.2%
Adult Status 4	1626	56.6%	1648	57.7%	1420	54.1%
Adult Status 5	82	2.9%	97	3.4%	105	4%
Adult Status 6	606	21.1%	519	18.2%	533	20.3%

Based on OPTN data as of August 12, 2022

Data subject to change based on future data submission or correction

Pre-Policy: January 31, 2019

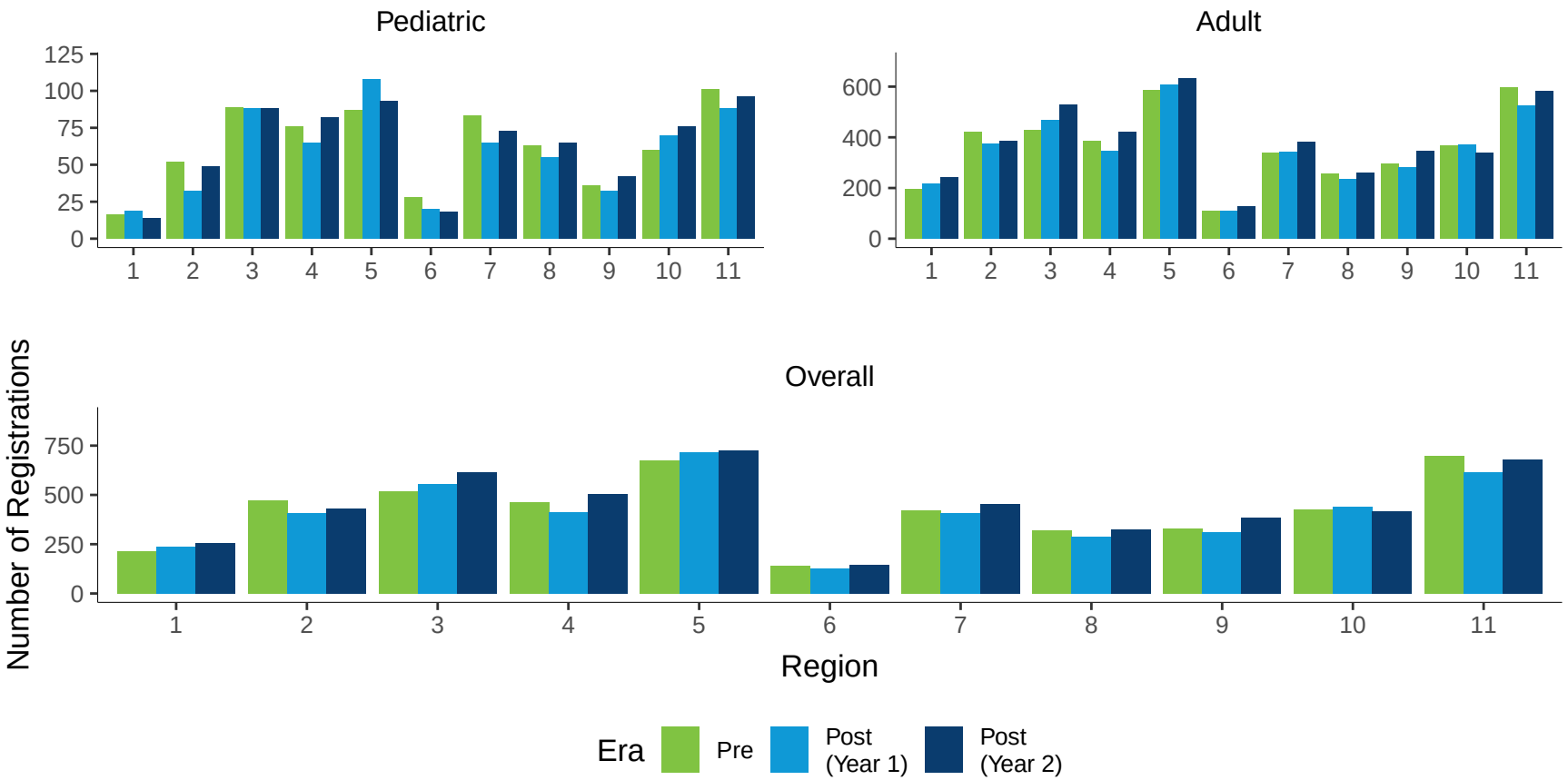
Post-Policy (Year 1): January 31, 2020

Post-Policy (Year 2): January 31, 2021

Figure 2 shows the number of heart waitlist additions by region and era, overall and for pediatric and adult candidates. Overall, waitlist additions remained similar pre- to post-implementation for all regions. Table 3 shows the number of heart waiting list additions by region and era (including post-policy years).

Figure A1 shows the number of heart waitlist additions by region and medical urgency status pre- and post-implementation. Tables A1 and A2 show the number and percent of waitlist additions by region and medical urgency status pre- and post-implementation, respectively.

Figure 2. Heart Waiting List Additions by Region and Era



Based on OPTN data as of August 12, 2022
Data subject to change based on future data submission or correction
Pre−Policy: January 08, 2019 − January 08, 2020
Post−Policy (Year 1): January 09, 2020 − January 08, 2021
Post−Policy (Year 2): January 09, 2021 − January 08, 2022

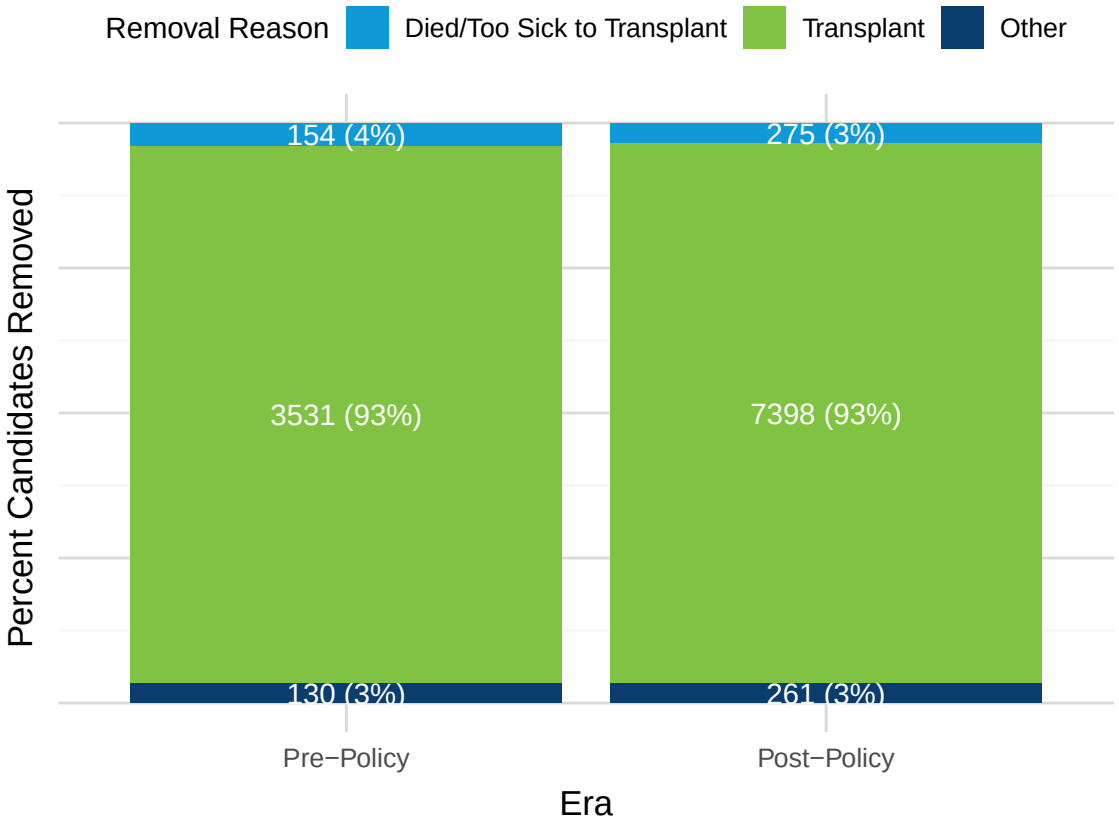
Table 3. Heart Waiting List Additions by Region and Era

		Pre-Policy		Post-Policy (Year 1)		Post-Policy (Year 2)		Post-Policy (Overall)	
Age Group	**Region**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Pediatric	1	16	2.3%	19	3%	14	2%	33	2.5%
	2	52	7.5%	32	5%	49	7%	81	6.1%
	3	89	12.9%	88	13.7%	88	12.6%	176	13.2%
	4	76	11%	65	10.1%	82	11.8%	147	11%
	5	87	12.6%	108	16.8%	93	13.4%	201	15%
	6	28	4.1%	20	3.1%	18	2.6%	38	2.8%
	7	83	12%	65	10.1%	73	10.5%	138	10.3%
	8	63	9.1%	55	8.6%	65	9.3%	120	9%
	9	36	5.2%	32	5%	42	6%	74	5.5%
	10	60	8.7%	70	10.9%	76	10.9%	146	10.9%
	11	101	14.6%	88	13.7%	96	13.8%	184	13.8%
Adult	1	197	4.9%	217	5.6%	243	5.7%	460	5.7%
	2	422	10.6%	374	9.7%	384	9%	758	9.3%
	3	428	10.7%	468	12.1%	528	12.4%	996	12.3%
	4	385	9.7%	346	8.9%	421	9.9%	767	9.4%
	5	587	14.7%	609	15.7%	634	14.9%	1243	15.3%
	6	111	2.8%	109	2.8%	127	3%	236	2.9%
	7	338	8.5%	341	8.8%	381	9%	722	8.9%
	8	255	6.4%	234	6%	261	6.1%	495	6.1%
	9	295	7.4%	280	7.2%	344	8.1%	624	7.7%
	10	368	9.2%	371	9.6%	340	8%	711	8.8%
	11	596	15%	526	13.6%	583	13.7%	1109	13.7%
Overall	1	213	4.6%	236	5.2%	257	5.2%	493	5.2%
	2	474	10.1%	406	9%	433	8.8%	839	8.9%
	3	517	11.1%	556	12.3%	616	12.5%	1172	12.4%
	4	461	9.9%	411	9.1%	503	10.2%	914	9.7%
	5	674	14.4%	717	15.9%	727	14.7%	1444	15.3%
	6	139	3%	129	2.9%	145	2.9%	274	2.9%
	7	421	9%	406	9%	454	9.2%	860	9.1%
	8	318	6.8%	289	6.4%	326	6.6%	615	6.5%
	9	331	7.1%	312	6.9%	386	7.8%	698	7.4%
	10	428	9.2%	441	9.8%	416	8.4%	857	9.1%
	11	697	14.9%	614	13.6%	679	13.7%	1293	13.7%

Based on OPTN data as of August 12, 2022
Data subject to change based on future data submission or correction
Pre-Policy: January 08, 2019 - January 08, 2020
Post-Policy (Year 1): January 09, 2020 - January 08, 2021
Post-Policy (Year 2): January 09, 2021 - January 08, 2022

Figure 3 examines the number and proportion of candidates removed from the waitlist by removal reason and era. The proportion of candidates removed from the waitlist due to death or being too sick to transplant remained similar across all eras and across post-policy years.

Figure 3. Candidates Removed from Waitlist by Removal Reason and Era



Based on OPTN data as of August 12, 2022
Data subject to change based on future data submission or correction
Temporarily inactive candidates were excluded
Deaths occuring within 7 days of non−transplant removal were counted as Died/Too Sick

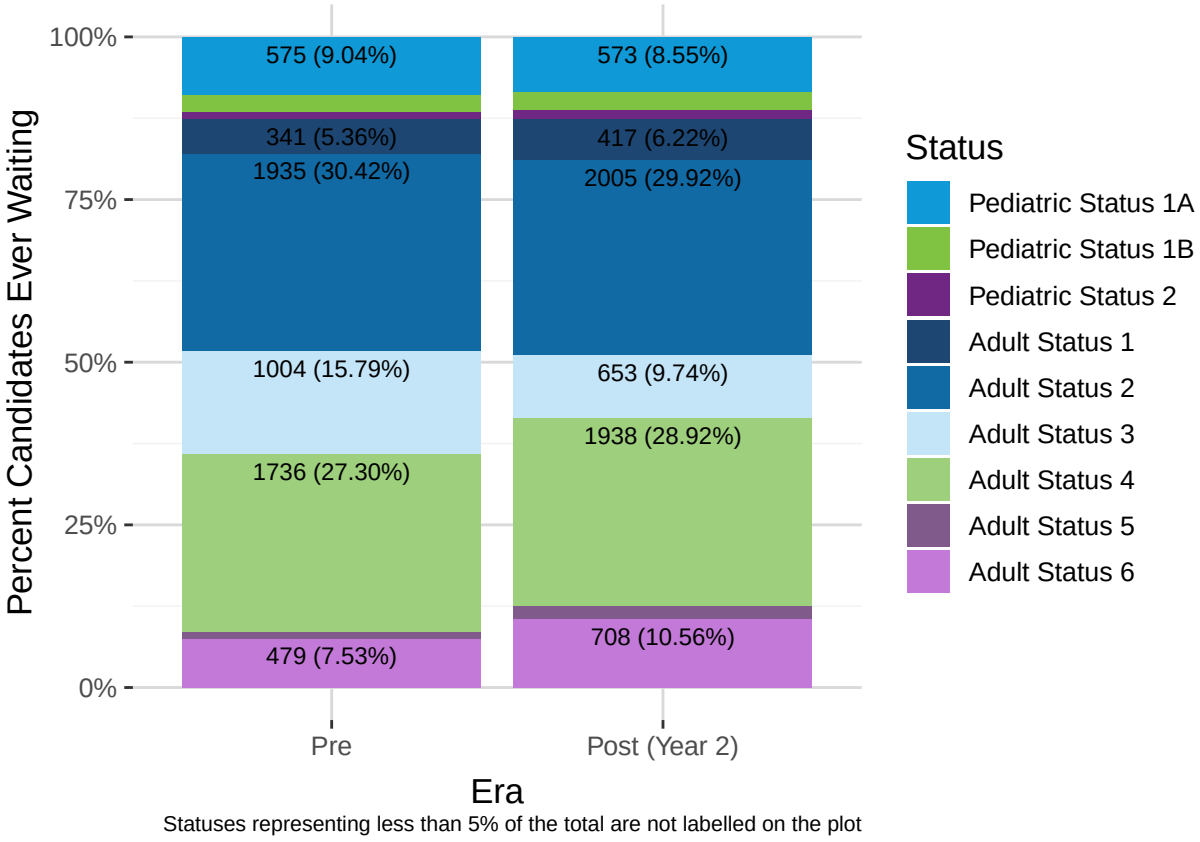
Figure 4 displays the counts and proportions of candidates removed from the waitlist by removal reason and medical urgency status. The proportion of candidates removed for death or being too sick to transplant increased slightly in Pediatric Status 1A and decreased slightly in Pediatric Statuses 1B post-implementation. This trend was consistent across post-policy years. Conversely, the proportion of candidates removed for death or being too sick to transplant among Pediatric Status 2 candidates increased in the first year post-implementation but decreased in the second year post-implementation. The proportion of candidates removed due to death or being too sick to transplant increased slightly for Adult Status 1, remained roughly the same for Adult Status 2, and decreased slightly for Adult Status 3. Adult Statuses 4 and 6 saw large decreases in the proportion of candidates removed due to death or being too sick to transplant, while Adult Status 5 saw a large increase in the proportion of candidates removed for these reasons. Similar patterns were seen among adult statuses when the post-policy period was stratified by year.

Figure 4. Candidates Removed by Removal Reason within Medical Urgency Status and Era

Based on OPTN data as of August 12, 2022
Data subject to change based on future data submission or correction
Temporarily inactive candidates were excluded
Deaths occuring within 7 days of non−transplant removal were counted as Died/Too Sick
Removal reasons representing <5% of the total are not labeled on the plot
Pre−Policy: January 08, 2019 − January 08, 2020
Post−Policy (Year 1): January 09, 2020 − January 08, 2021
Post−Policy (Year 2): January 09, 2021 − January 08, 2022

Figure 5 shows the percent of candidates ever-waiting by medical urgency status and era. Only the second year post-policy is displayed, as this post-policy ever-waiting cohort is of the same duration and occurs in the same season as the pre-policy ever-waiting cohort. Post-implementation there was an increase in the percent of Adult Status 6 candidates ever waiting and a decrease in the percent of Adult Status 3 candidates ever waiting.

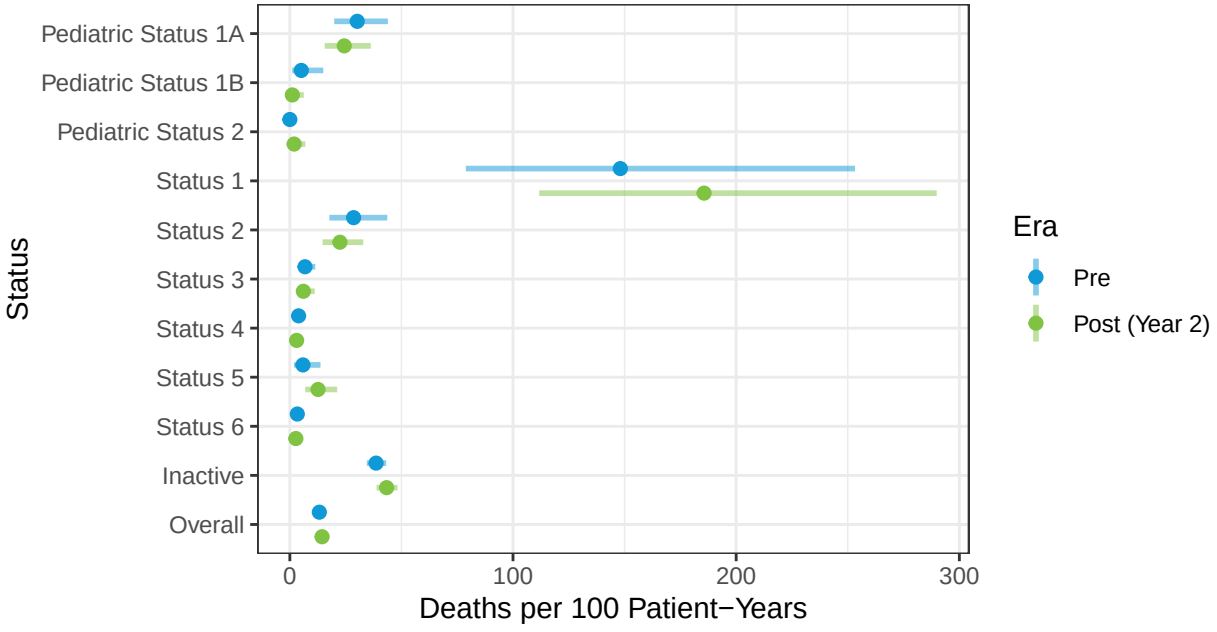
Figure 5. Candidates Ever Waiting by Era and Medical Urgency Status



Statuses representing less than 5% of the total are not labelled on the plot

Figure 6 and Table 4 show the waitlist mortality rates during the second year post-policy by medical urgency status and era. Waitlist mortality rates were defined as the number of deaths per 100 patient years. Calculations were restricted to the second year post-policy to ensure that the length of time and seasonality were comparable to those in the pre-policy era. There was no significant difference in waitlist mortality rates by era overall. Although waitlist mortality did differ slightly post-implementation within some statuses, these differences were not statistically significant.

Figure 6. Deaths per 100 Patient-Years Waiting by Medical Urgency Status and Era



Based on OPTN data as of August 12, 2022
Data subject to change based on future data submission or correction
Pre−Policy: January 08, 2019 − January 08, 2020
Post−Policy (Year 2): January 09, 2021 − January 08, 2022
Only the second post−policy year is used to ensure that the duration and seasonality of this cohort are comparable with the pre−policy era.
Deaths occuring within 7 days of non−transplant removal were counted as deaths.
Repeat transplants are excluded.

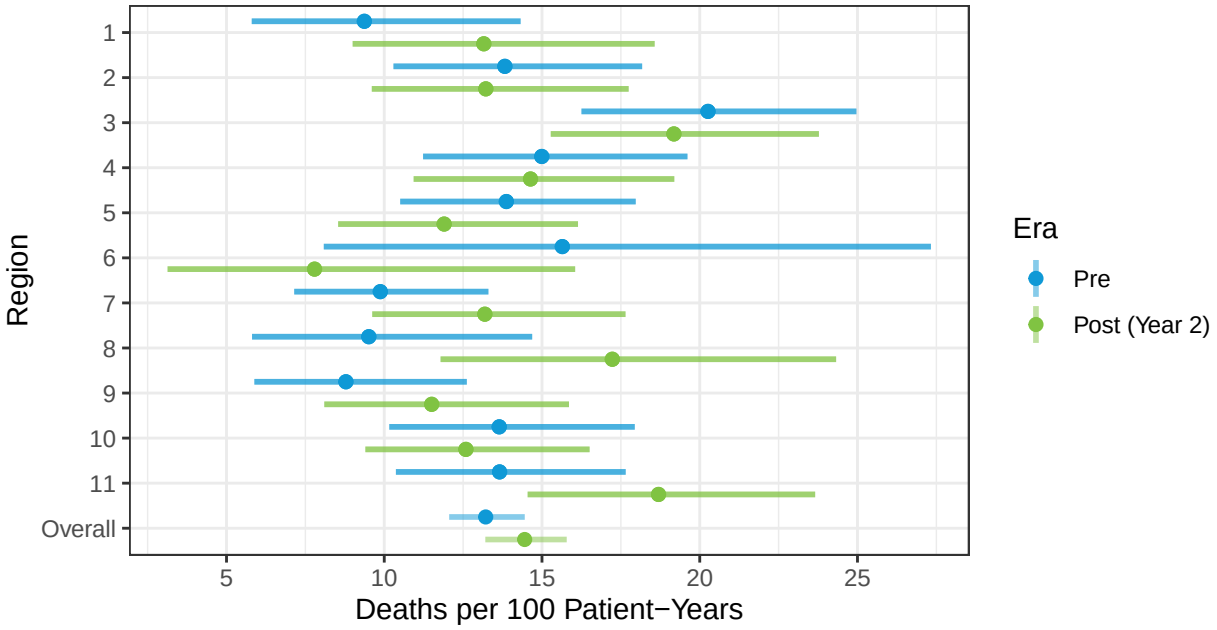
Table 4. Deaths per 100 Patient-Years Waiting by Medical Urgency Status and Era

Status	Era	Patients Ever Waiting	Deaths	Deaths per 100 Patient Years	95% CI
Pediatric Status 1A	Pre	619	27	30.19	[19.90, 43.93]
	Post (Year 2)	626	24	24.38	[15.62, 36.28]
Pediatric Status 1B	Pre	296	3	5.13	[1.06, 14.98]
	Post (Year 2)	335	1	1.12	[0.03, 6.25]
Pediatric Status 2	Pre	242	0	0.00	–
	Post (Year 2)	242	2	1.91	[0.23, 6.90]
Status 1	Pre	345	13	148.10	[78.85, 253.25]
	Post (Year 2)	446	19	185.63	[111.76, 289.88]
Status 2	Pre	1805	21	28.57	[17.68, 43.67]
	Post (Year 2)	2170	26	22.44	[14.66, 32.88]
Status 3	Pre	1935	14	6.79	[3.71, 11.40]
	Post (Year 2)	1378	10	6.06	[2.91, 11.15]
Status 4	Pre	3764	63	3.92	[3.01, 5.02]
	Post (Year 2)	3301	42	3.05	[2.20, 4.12]
Status 5	Pre	261	5	5.88	[1.91, 13.73]
	Post (Year 2)	318	14	12.64	[6.91, 21.20]
Status 6	Pre	1740	19	3.34	[2.01, 5.22]
	Post (Year 2)	1559	15	2.70	[1.51, 4.46]
Inactive	Pre	2697	314	38.65	[34.49, 43.16]
	Post (Year 2)	2641	340	43.37	[38.88, 48.23]
Overall	Pre	7975	479	13.22	[12.06, 14.45]
	Post (Year 2)	8045	493	14.45	[13.20, 15.78]

Based on OPTN data as of August 12, 2022
Data subject to change based on future data submission or correction
Pre-Policy: January 08, 2019 - January 08, 2020;
Post-Policy (Year 2): January 08, 2021 - January 08, 2022;
Only the second post-policy year is used to ensure that the duration and seasonality of this cohort are comparable with the pre-policy era.
Deaths occuring within 7 days of non-transplant removal were counted as deaths.
Repeat transplants are excluded.

Figure 7 shows the waitlist mortality rates by region and era. There was no significant difference in waitlist mortality by era overall. Although waitlist mortality did differ post-implementation within some regions, these differences were not statistically significant.

Figure 7. Deaths per 100 Patient-Years Waiting by Region and Era



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Pre−Policy: January 08, 2019 − January 08, 2020
Post−Policy (Year 2): January 09, 2021 − January 08, 2022
Only the second post−policy year is used to ensure that the duration and seasonality of this cohort are comparable with the pre−policy era.
Deaths occuring within 7 days of non−transplant removal were counted as deaths.
Repeat transplants are excluded.

Table 5 shows the number of candidates ever waiting and the number of deaths for each region pre- and post-implementation, as well as the number of deaths per 100 patient-years, and the 95% confidence interval around the number of deaths per 100 patient-years.

Table 5. Deaths per 100 Patient-Years Waiting by Region and Era

Region	Era	Patients Ever Waiting	Deaths	Deaths per 100 Patient Years	CI
1	Pre	447	21	9.37	[5.80, 14.32]
	Post (Year 2)	473	32	13.16	[9.00, 18.57]
2	Pre	811	51	13.82	[10.29, 18.17]
	Post (Year 2)	751	44	13.22	[9.61, 17.75]
3	Pre	958	88	20.26	[16.25, 24.96]
	Post (Year 2)	1005	83	19.18	[15.28, 23.78]
4	Pre	796	53	14.99	[11.23, 19.61]
	Post (Year 2)	828	52	14.64	[10.93, 19.19]
5	Pre	1077	57	13.87	[10.51, 17.97]
	Post (Year 2)	1039	41	11.90	[8.54, 16.14]
6	Pre	200	12	15.64	[8.08, 27.33]
	Post (Year 2)	219	7	7.79	[3.13, 16.05]
7	Pre	831	43	9.88	[7.15, 13.30]
	Post (Year 2)	788	45	13.19	[9.62, 17.65]
8	Pre	499	20	9.51	[5.81, 14.69]
	Post (Year 2)	493	32	17.23	[11.78, 24.32]
9	Pre	643	29	8.79	[5.88, 12.62]
	Post (Year 2)	684	37	11.50	[8.10, 15.86]
10	Pre	767	51	13.64	[10.16, 17.94]
	Post (Year 2)	797	52	12.59	[9.40, 16.51]
11	Pre	1022	58	13.66	[10.37, 17.65]
	Post (Year 2)	1030	69	18.69	[14.55, 23.66]
Overall	Pre	7975	479	13.22	[12.06, 14.45]
	Post (Year 2)	8045	493	14.45	[13.20, 15.78]

Based on OPTN data as of August 12, 2022
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Pre-Policy: January 08, 2019 - January 08, 2020;
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Only the second post-policy year is used to ensure that the duration and seasonality of this cohort are comparable with the pre-policy era.
Deaths occuring within 7 days of non-transplant removal were counted as deaths.
Repeat transplants are excluded.

Transplant

The analyses in this chapter describe the differences in transplants between the pre-implementation and post-implementation cohorts. Where possible the post-implementation cohort was stratified by year (first year post-policy: January 09 2020 - January 08 2021; second year post-policy: January 09 2021 - January 08 2022).

Overall there were 3550 heart transplants performed pre-implementation (January 08 2019 - January 08 2020) and 7475 heart transplants performed post-implementation (January 09 2020 - January 08 2022). This includes 3678 heart transplants performed in the first year post-policy and 3797 heart transplants performed in the second year post-policy.

Figure 8 shows the number of adult heart transplants by era overall and for pediatric and adult recipients separately. The number of pediatric transplants in both post-policy years was smaller than that in the pre-policy period. Conversely, the number of adult heart transplants in both post-policy years increased relative to the pre-policy period.

Figure 8. Number of Heart Transplants by Era

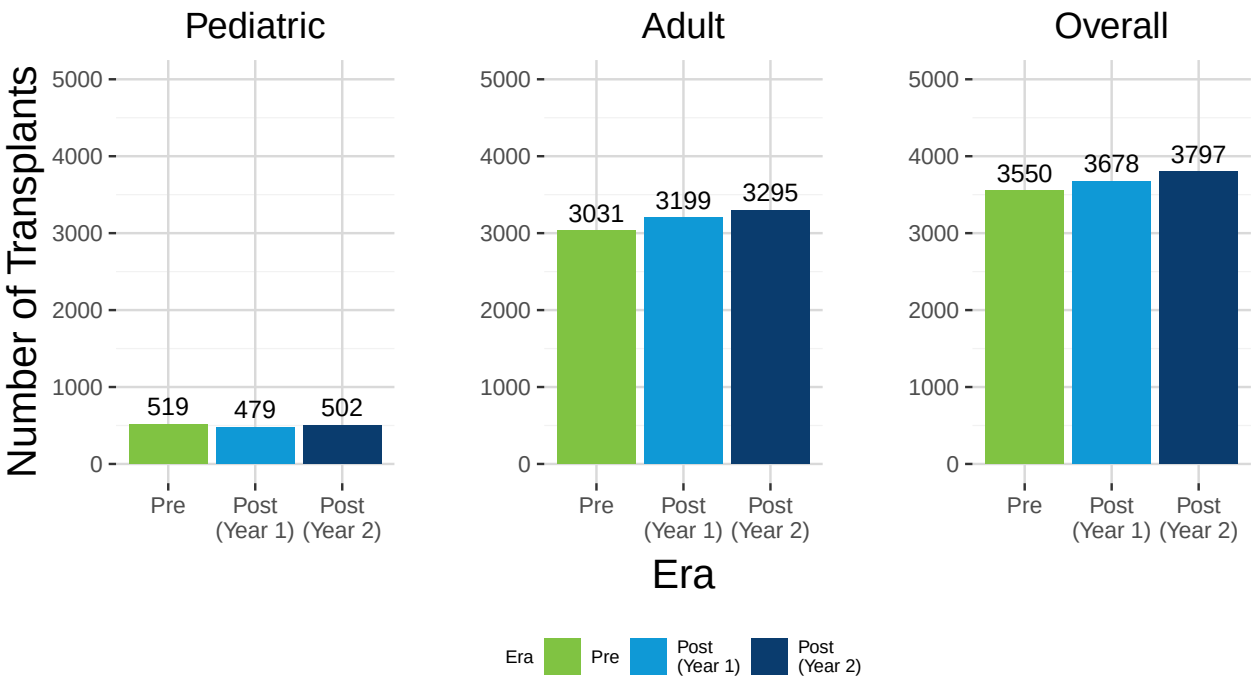


Figure 9 and Table 6 show the proportion and counts of heart transplants by era and medical urgency status. The proportion of transplants going to Adult Statuses 5 and 6 increased in all post-implementation cohorts and overall but made up less than 5% of heart transplants in each era. Post-implementation there was a smaller proportion of Adult Status 3 transplants and a larger proportion of Adult Status 4 transplants; this persisted across all post-policy years. The proportion of Adult Status 1 and 2 transplants remained fairly similar across eras. The proportion of Pediatric Status 1A transplants decreased across all post-implementation eras. Pediatric Statuses 1B and 2 each made up less than 5% of all transplants and showed no consistent increase or decrease pre- to post-implementation.

Figure 9. Proportion of Heart Transplants by Medical Urgency Status and Era

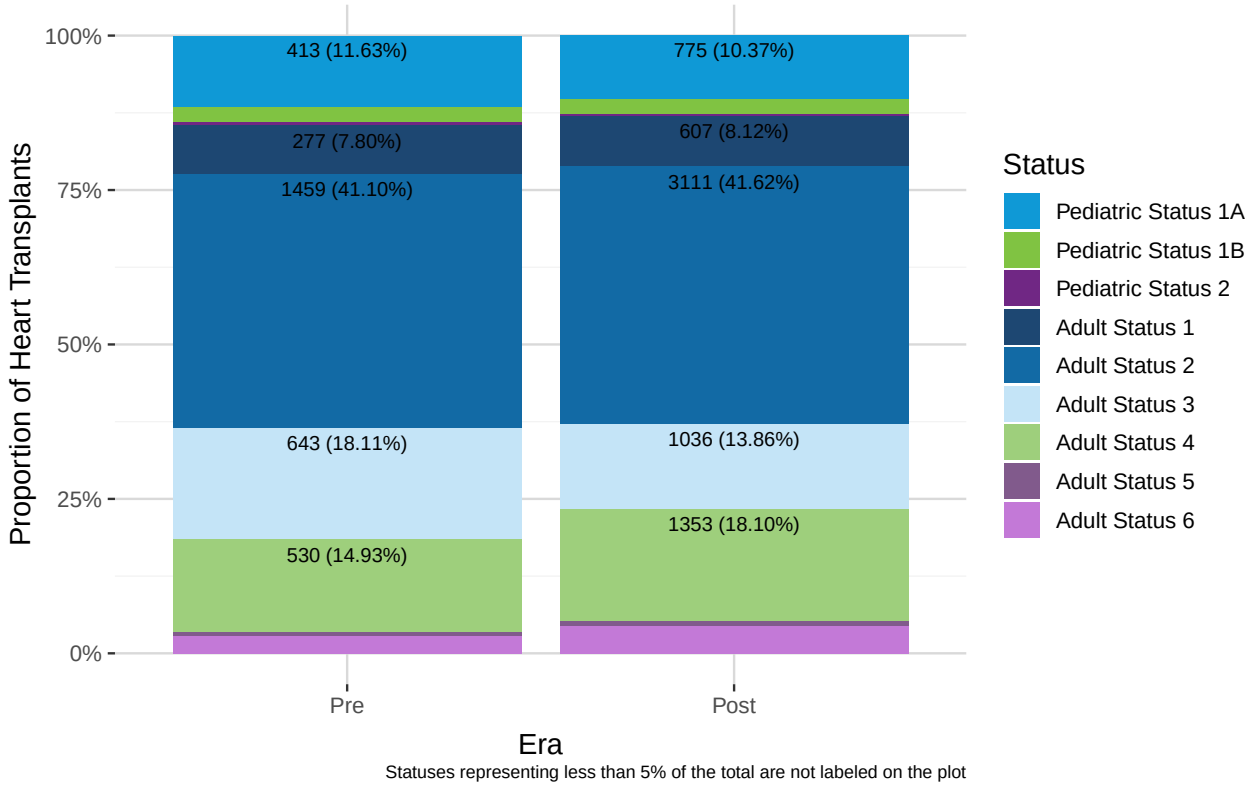


Table 6. Heart Transplants by Medical Urgency Status and Era

	Pre-Policy		Post-Policy (Year 1)		Post-Policy (Year 2)		Post-Policy (Overall)	
Status	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Pediatric Status 1A	413	11.6%	366	10%	409	10.8%	775	10.4%
Pediatric Status 1B	87	2.5%	89	2.4%	84	2.2%	173	2.3%
Pediatric Status 2	19	0.5%	24	0.7%	9	0.2%	33	0.4%
Adult Status 1	277	7.8%	249	6.8%	358	9.4%	607	8.1%
Adult Status 2	1459	41.1%	1430	38.9%	1681	44.3%	3111	41.6%
Adult Status 3	643	18.1%	592	16.1%	444	11.7%	1036	13.9%
Adult Status 4	530	14.9%	735	20%	618	16.3%	1353	18.1%
Adult Status 5	21	0.6%	32	0.9%	24	0.6%	56	0.7%
Adult Status 6	101	2.8%	161	4.4%	170	4.5%	331	4.4%

Pre-Policy: January 08, 2019 - January 08, 2020;
Post-Policy (Year 1): January 09, 2020 - January 08, 2021;
Post-Policy (Year 2): January 09, 2021 - January 08, 2022;
Post-Policy (Overall): January 09, 2020 - January 08, 2022

Figure 10 and Table 7 show the number of heart transplants performed by OPTN region. The number of transplants performed remained fairly similar pre- to post-implementation for pediatrics, adults and overall. Table 7 further breaks down the count and percent of adult, pediatric and overall transplants by region and post-policy year.

Figure A2 shows the number of adult heart transplants performed by region, medical urgency status and era. Adult statuses 5 and 6 each made up less than 5% of all transplants in each region pre- and post-implementation. The percent of Adult Status 4 transplants increased in every region while the percent of Adult Status 3 transplants decreased in all Regions or remained within 1% (except for Region 8, which experienced an increase in Adult Status 3 transplants). Tables A3 and A4 show the number and percent of heart transplants by region and medical urgency status pre- and post-implementation respectively.

Figure 10. Heart Transplants by Region and Era

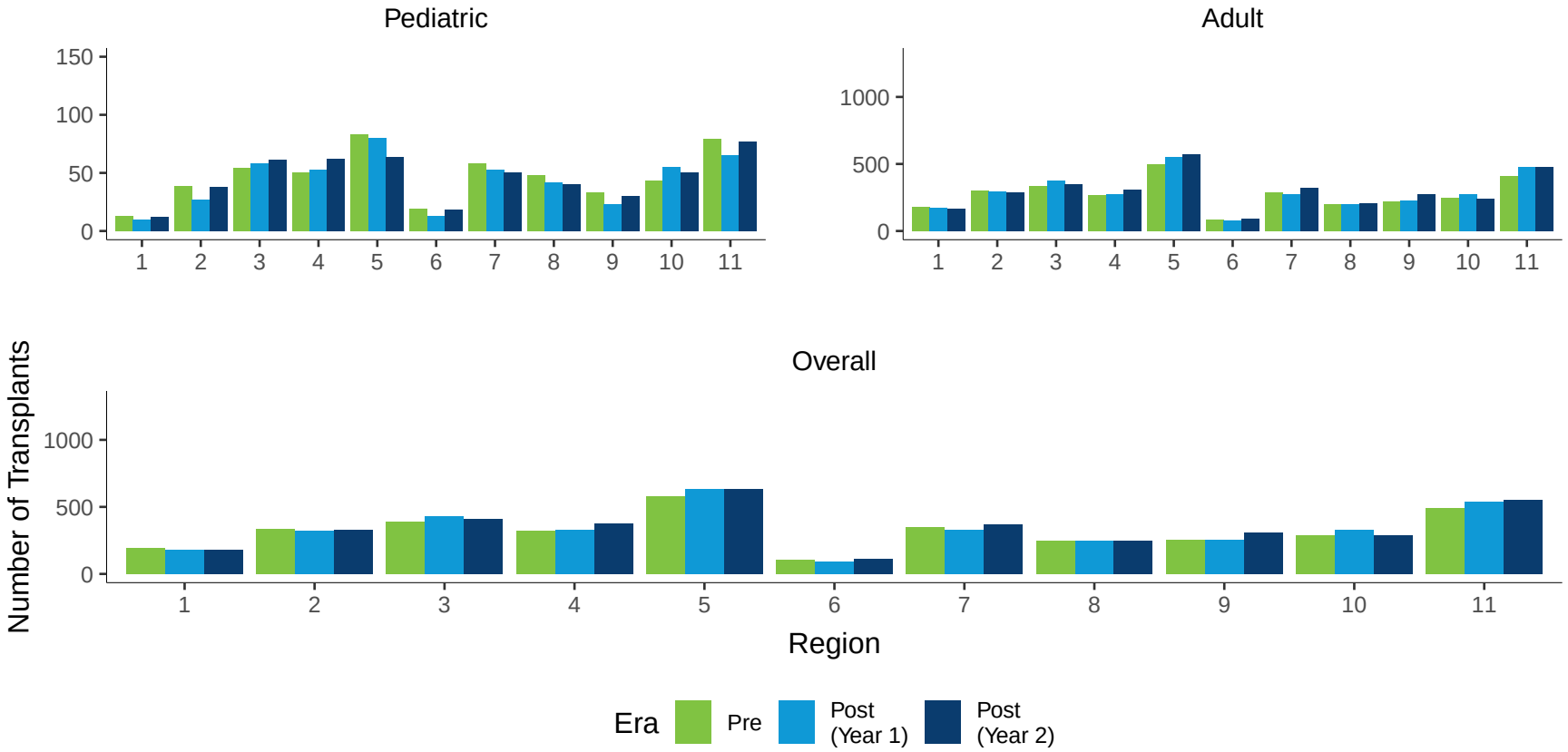


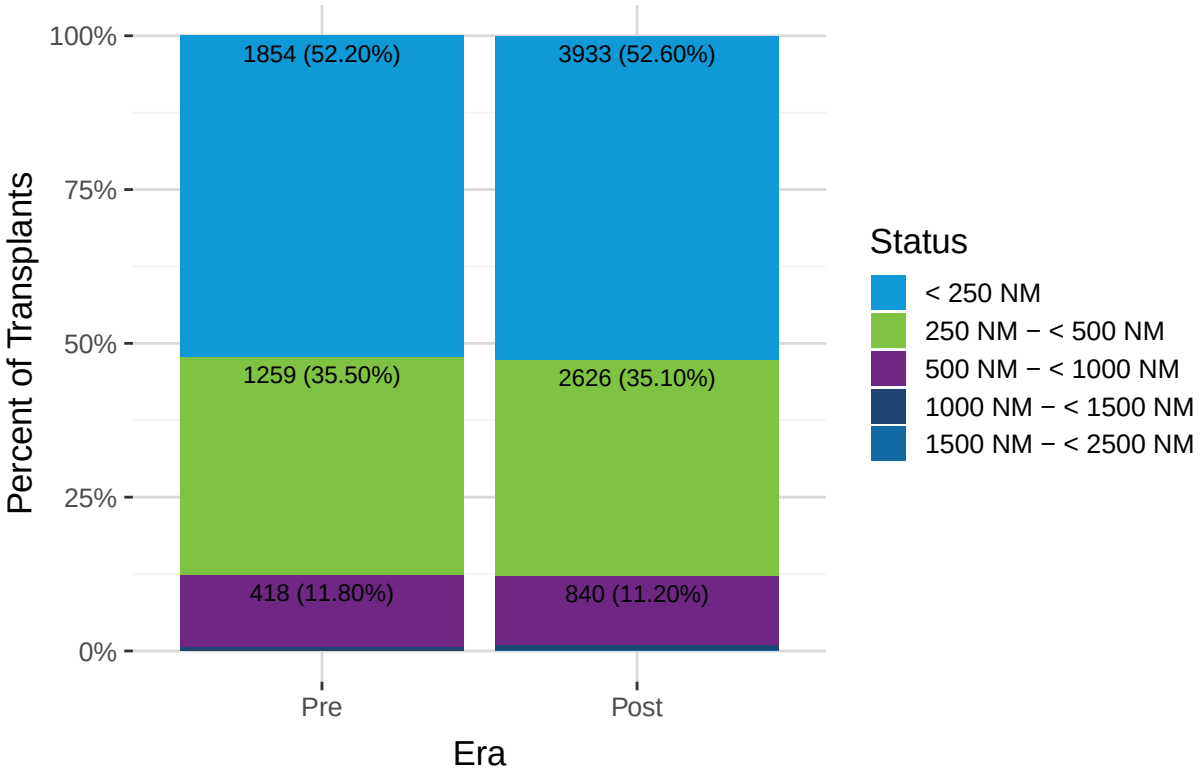
Table 7. Heart Transplants by Region and Era

		Pre-Policy		Post-Policy (Year 1)		Post-Policy (Year 2)		Post-Policy (Overall)	
Age Group	**Region**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Pediatric	1	13	2.5%	10	2.1%	12	2.4%	22	2.2%
	2	39	7.5%	27	5.6%	38	7.6%	65	6.6%
	3	54	10.4%	58	12.1%	61	12.2%	119	12.1%
	4	50	9.6%	53	11.1%	62	12.4%	115	11.7%
	5	83	16%	80	16.7%	64	12.7%	144	14.7%
	6	19	3.7%	13	2.7%	18	3.6%	31	3.2%
	7	58	11.2%	53	11.1%	50	10%	103	10.5%
	8	48	9.2%	42	8.8%	40	8%	82	8.4%
	9	33	6.4%	23	4.8%	30	6%	53	5.4%
	10	43	8.3%	55	11.5%	50	10%	105	10.7%
	11	79	15.2%	65	13.6%	77	15.3%	142	14.5%
Adult	1	180	5.9%	172	5.4%	165	5%	337	5.2%
	2	299	9.9%	293	9.2%	290	8.8%	583	9%
	3	337	11.1%	373	11.7%	346	10.5%	719	11.1%
	4	270	8.9%	272	8.5%	311	9.4%	583	9%
	5	498	16.4%	554	17.3%	571	17.3%	1125	17.3%
	6	83	2.7%	80	2.5%	92	2.8%	172	2.6%
	7	290	9.6%	274	8.6%	319	9.7%	593	9.1%
	8	197	6.5%	202	6.3%	209	6.3%	411	6.3%
	9	220	7.3%	229	7.2%	277	8.4%	506	7.8%
	10	246	8.1%	276	8.6%	240	7.3%	516	7.9%
	11	411	13.6%	474	14.8%	475	14.4%	949	14.6%
Overall	1	193	5.4%	182	4.9%	177	4.7%	359	4.8%
	2	338	9.5%	320	8.7%	328	8.6%	648	8.7%
	3	391	11%	431	11.7%	407	10.7%	838	11.2%
	4	320	9%	325	8.8%	373	9.8%	698	9.3%
	5	581	16.4%	634	17.2%	635	16.7%	1269	17%
	6	102	2.9%	93	2.5%	110	2.9%	203	2.7%
	7	348	9.8%	327	8.9%	369	9.7%	696	9.3%
	8	245	6.9%	244	6.6%	249	6.6%	493	6.6%
	9	253	7.1%	252	6.9%	307	8.1%	559	7.5%
	10	289	8.1%	331	9%	290	7.6%	621	8.3%
	11	490	13.8%	539	14.7%	552	14.5%	1091	14.6%

Pre-Policy: January 08, 2019 - January 08, 2020;
Post-Policy (Year 1): January 09, 2020 - January 08, 2021;
Post-Policy (Year 2): January 09, 2021 - January 08, 2022;
Post-Policy (Overall): January 09, 2020 - January 08, 2022

Figure 11 shows heart transplants by distance traveled and era. Only a small number of transplants occurred within 1000-<1500 NM and only 8 transplants occurred over 1500 NM in the post-implementation era. Overall, the percent of transplants in each distance category remained roughly the same pre- versus post-policy. The percent of transplants <250 NM increased in the first post-policy year and decreased in the second one. Conversely, the percent of transplants 250-<500 NM decreased in the first post-policy year and increased in the second one. Changes in pediatric transplants by distance traveled were less consistent across post-policy years and therefore harder to interpret.

Figure 11. Heart Transplants by Distance Traveled and Era



Distance groups representing less than 5% of the total are not labelled on the plot;
There were n=19 and n=68 transplants within 1000−<1500NM pre− and post−policy, respectively;
There were n=8 transplants within 1500−<2500 NM post−implementation

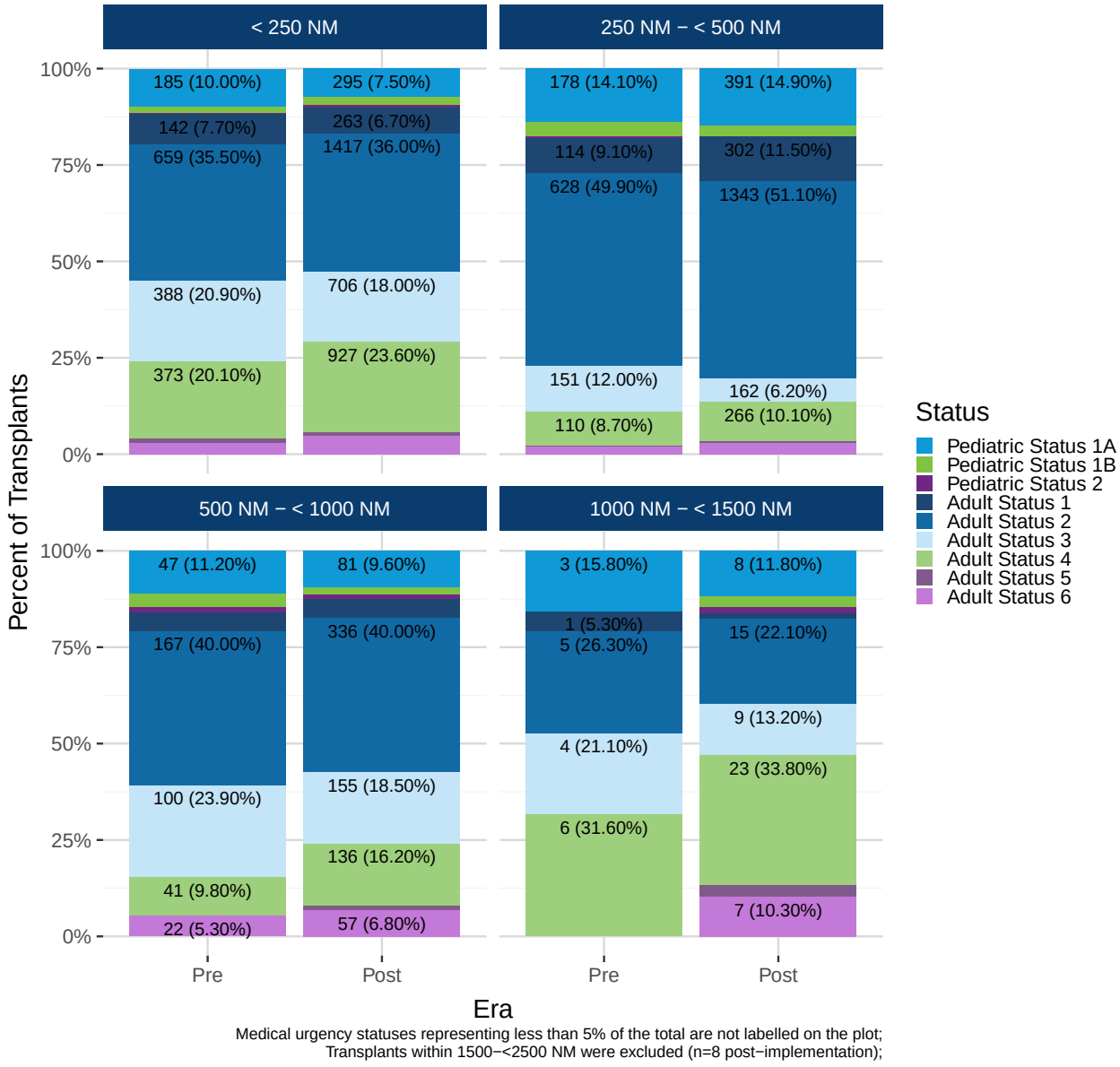
Table 8. Heart Transplants by Distance Traveled and Era

		Pre-Policy		Post-Policy (Year 1)		Post-Policy (Year 2)		Post-Policy (Overall)	
Age Group	**Distance Group**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Pediatric	< 250 NM	220	42.4%	193	40.3%	207	41.2%	400	40.8%
	250 NM - < 500 NM	229	44.1%	215	44.9%	249	49.6%	464	47.3%
	500 NM - < 1000 NM	67	12.9%	64	13.4%	42	8.4%	106	10.8%
	1000 NM - < 1500 NM	3	0.6%	7	1.5%	4	0.8%	11	1.1%
Adult	< 250 NM	1634	53.9%	1826	57.1%	1707	51.8%	3533	54.4%
	250 NM - < 500 NM	1030	34%	1003	31.4%	1159	35.2%	2162	33.3%
	500 NM - < 1000 NM	351	11.6%	347	10.8%	387	11.7%	734	11.3%
	1000 NM - < 1500 NM	16	0.5%	21	0.7%	36	1.1%	57	0.9%
	1500 NM - < 2500 NM	0	0%	2	0.1%	6	0.2%	8	0.1%
Overall	< 250 NM	1854	52.2%	2019	54.9%	1914	50.4%	3933	52.6%
	250 NM - < 500 NM	1259	35.5%	1218	33.1%	1408	37.1%	2626	35.1%
	500 NM - < 1000 NM	418	11.8%	411	11.2%	429	11.3%	840	11.2%
	1000 NM - < 1500 NM	19	0.5%	28	0.8%	40	1.1%	68	0.9%
	1500 NM - < 2500 NM	0	0%	2	0.1%	6	0.2%	8	0.1%

Pre-Policy: January 08, 2019 - January 08, 2020;
Post-Policy (Year 1): January 09, 2020 - January 08, 2021;
Post-Policy (Year 2): January 09, 2021 - January 08, 2022;
Post-Policy (Overall): January 09, 2020 - January 08, 2022

Figure 12 and Table 9 show the percent of heart transplants by distance traveled and medical urgency status. Hearts traveling <250 NM were fairly evenly distributed between adult status 1, 2 and 3 recipients in both eras while the majority of hearts traveling between 250 and 500 NM went to adult status 2 candidates in both eras. Post-removal of DSA from heart allocation, a larger percentage of hearts traveling 500 - <1000NM went to adult status 4 candidates and a smaller percent to adult status 3. Only a small number of hearts traveled 1000-<1500 NM but there did appear to be an increase in the proportion of less medical urgent candidates (pediatric status 1B and 2 and adult statuses 5 & 6) in the post-policy era. Similar patterns were seen when the post-policy period was stratified by year.

Figure 12. Heart Transplants by Distance Traveled, Medical Urgency Status and Era



Medical urgency statuses representing less than 5% of the total are not labelled on the plot;
Transplants within 1500–<2500 NM were excluded (n=8 post–implementation);

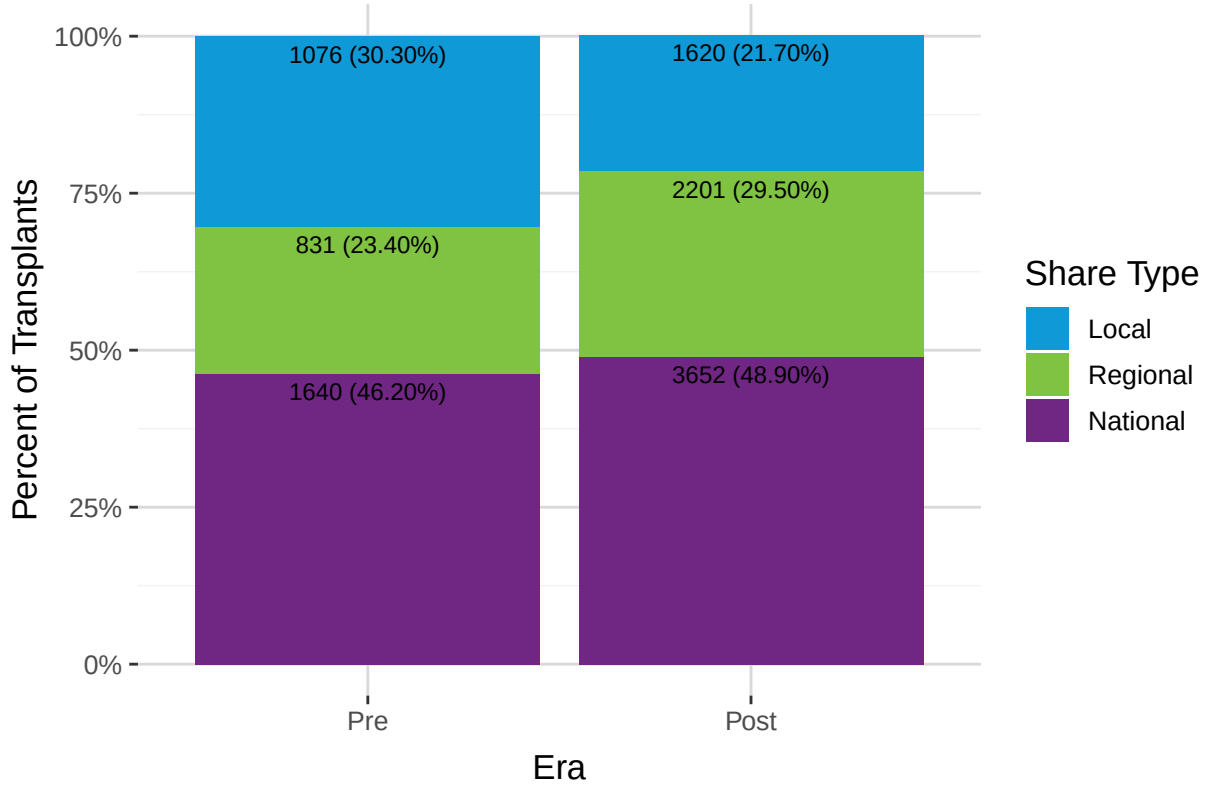
Table 9. Heart Transplants by Distance Traveled, Medical Urgency Status and Era

		Pre-Policy		Post-Policy (Year 1)		Post-Policy (Year 2)		Post-Policy (Overall)	
Distance Group	**Status**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
< 250 NM	Pediatric Status 1A	185	10%	135	6.7%	160	8.4%	295	7.5%
	Pediatric Status 1B	29	1.6%	47	2.3%	40	2.1%	87	2.2%
	Pediatric Status 2	6	0.3%	11	0.5%	7	0.4%	18	0.5%
	Adult Status 1	142	7.7%	110	5.4%	153	8%	263	6.7%
	Adult Status 2	659	35.5%	655	32.4%	762	39.8%	1417	36%
	Adult Status 3	388	20.9%	419	20.8%	287	15%	706	18%
	Adult Status 4	373	20.1%	519	25.7%	408	21.3%	927	23.6%
	Adult Status 5	18	1%	20	1%	14	0.7%	34	0.9%
	Adult Status 6	54	2.9%	103	5.1%	83	4.3%	186	4.7%
250 NM - < 500 NM	Pediatric Status 1A	178	14.1%	181	14.9%	210	14.9%	391	14.9%
	Pediatric Status 1B	44	3.5%	29	2.4%	38	2.7%	67	2.6%
	Pediatric Status 2	7	0.6%	5	0.4%	1	0.1%	6	0.2%
	Adult Status 1	114	9.1%	117	9.6%	185	13.1%	302	11.5%
	Adult Status 2	628	49.9%	611	50.2%	732	52%	1343	51.1%
	Adult Status 3	151	12%	93	7.6%	69	4.9%	162	6.2%
	Adult Status 4	110	8.7%	142	11.7%	124	8.8%	266	10.1%
	Adult Status 5	2	0.2%	7	0.6%	4	0.3%	11	0.4%
	Adult Status 6	25	2%	33	2.7%	45	3.2%	78	3%
500 NM - < 1000 NM	Pediatric Status 1A	47	11.2%	45	10.9%	36	8.4%	81	9.6%
	Pediatric Status 1B	14	3.3%	12	2.9%	5	1.2%	17	2%
	Pediatric Status 2	6	1.4%	7	1.7%	1	0.2%	8	1%
	Adult Status 1	20	4.8%	22	5.4%	19	4.4%	41	4.9%
	Adult Status 2	167	40%	158	38.4%	178	41.5%	336	40%
	Adult Status 3	100	23.9%	75	18.2%	80	18.6%	155	18.5%
	Adult Status 4	41	9.8%	65	15.8%	71	16.6%	136	16.2%
	Adult Status 5	1	0.2%	4	1%	5	1.2%	9	1.1%
	Adult Status 6	22	5.3%	23	5.6%	34	7.9%	57	6.8%
1000 NM - < 1500 NM	Pediatric Status 1A	3	15.8%	5	17.9%	3	7.5%	8	11.8%
	Pediatric Status 1B	0	0%	1	3.6%	1	2.5%	2	2.9%
	Pediatric Status 2	0	0%	1	3.6%	0	0%	1	1.5%
	Adult Status 1	1	5.3%	0	0%	1	2.5%	1	1.5%
	Adult Status 2	5	26.3%	6	21.4%	9	22.5%	15	22.1%
	Adult Status 3	4	21.1%	3	10.7%	6	15%	9	13.2%
	Adult Status 4	6	31.6%	9	32.1%	14	35%	23	33.8%
	Adult Status 5	0	0%	1	3.6%	1	2.5%	2	2.9%
	Adult Status 6	0	0%	2	7.1%	5	12.5%	7	10.3%
1500 NM - < 2500 NM	Adult Status 3	0	0%	2	100%	2	33.3%	4	50%
	Adult Status 4	0	0%	0	0%	1	16.7%	1	12.5%
	Adult Status 6	0	0%	0	0%	3	50%	3	37.5%

Pre: January 08, 2019 - January 08, 2020; Post (Year 1): January 09, 2020 - January 08, 2021; Post (Year 2): January 09, 2021 - January 08, 2022

Figure 14 and Table 10 show the proportion and number of heart transplants by share type and era. Here, "local" refers to hearts recovered and transplanted within the same DSA, "regional" refers to hearts recovered and transplanted in different DSAs but within the same OPTN region, and "national" refers to hearts recovered and transplanted in different OPTN regions. Overall, the number of local transplants decreased post-implementation while regional shares increased. The proportion of national shares remained similar pre- to post-implementation. These findings were consistent across age groups and post-policy years.

Figure 14. Heart Transplants by Share Type



Share types representing less than 5% of the total are not labelled on the plot;
Foreign Canadian shares excluded (n=3 Pre, n=2 Post (Year 1), n=0 Post (Year 2));

Table 10. Heart Transplants by Share Type

		Pre-Policy		Post-Policy (Year 1)		Post-Policy (Year 2)		Post-Policy (Overall)	
Age Group	**Share Type**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Pediatric	Local	92	17.8%	64	13.4%	82	16.3%	146	14.9%
	Regional	127	24.5%	145	30.3%	139	27.7%	284	29%
	National	299	57.7%	270	56.4%	281	56%	551	56.2%
Adult	Local	984	32.5%	769	24.1%	705	21.4%	1474	22.7%
	Regional	704	23.2%	955	29.9%	962	29.2%	1917	29.5%
	National	1341	44.3%	1473	46.1%	1628	49.4%	3101	47.8%
Overall	Local	1076	30.3%	833	22.7%	787	20.7%	1620	21.7%
	Regional	831	23.4%	1100	29.9%	1101	29%	2201	29.5%
	National	1640	46.2%	1743	47.4%	1909	50.3%	3652	48.9%

Foreign Canadian Shares Excluded (n=3 Pre, n=2 Post (Year 1), n=0 Post (Year 2));
Pre-Policy: January 08, 2019 - January 08, 2020;
Post-Policy (Year 1): January 09, 2020 - January 08, 2021;
Post-Policy (Year 2): January 09, 2021 - January 08, 2022;
Post-Policy (Overall): January 09, 2020 - January 08, 2022

Figure 15 and Table 11 show the number and percent of heart transplants by geographic area. Regions 5 and 6 were considered to be in the West; Regions 1, 2, and 9 in the Northeast; Regions 3, 4, and 11 in the South or Southeast; and Regions 7, 8, and 10 were considered to be in the Midwest. There were similar proportions of heart transplants pre- to post-implementation for all geographic areas.

Figure 15. Heart Transplants by Geographic Area

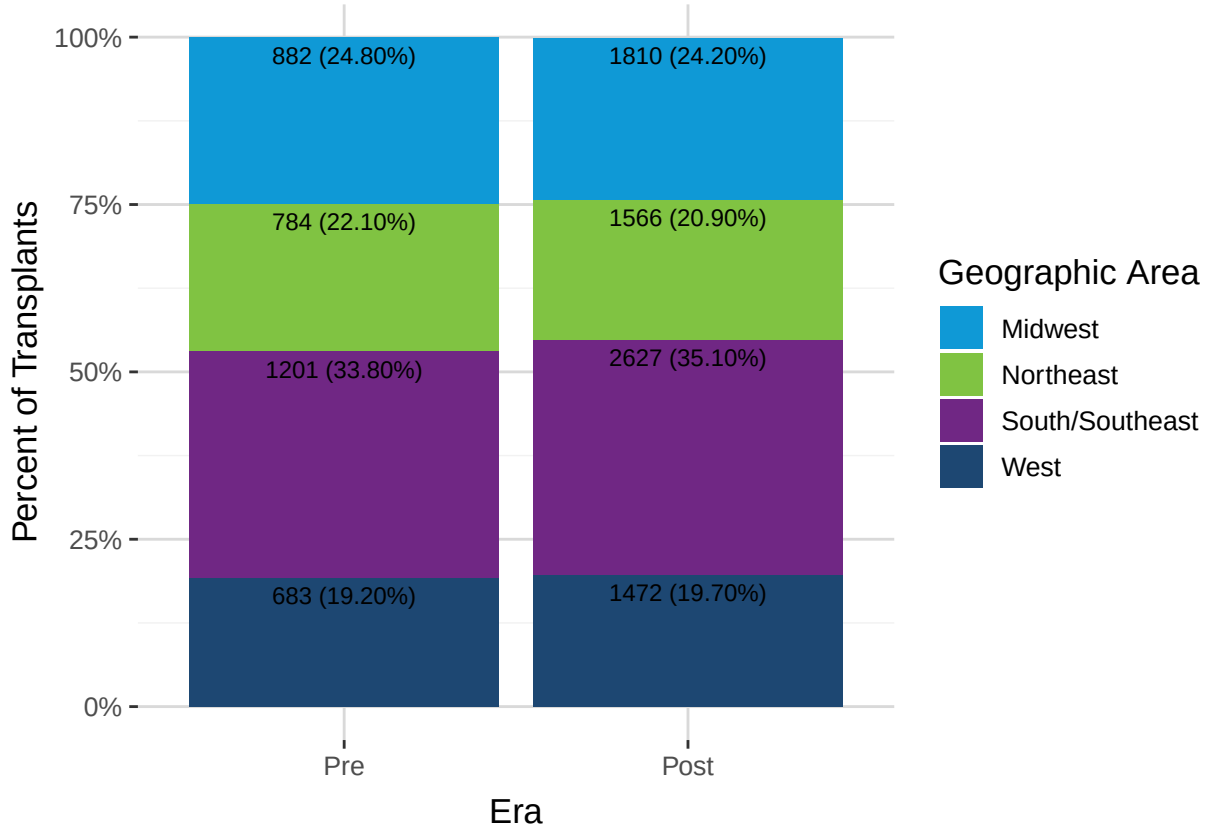


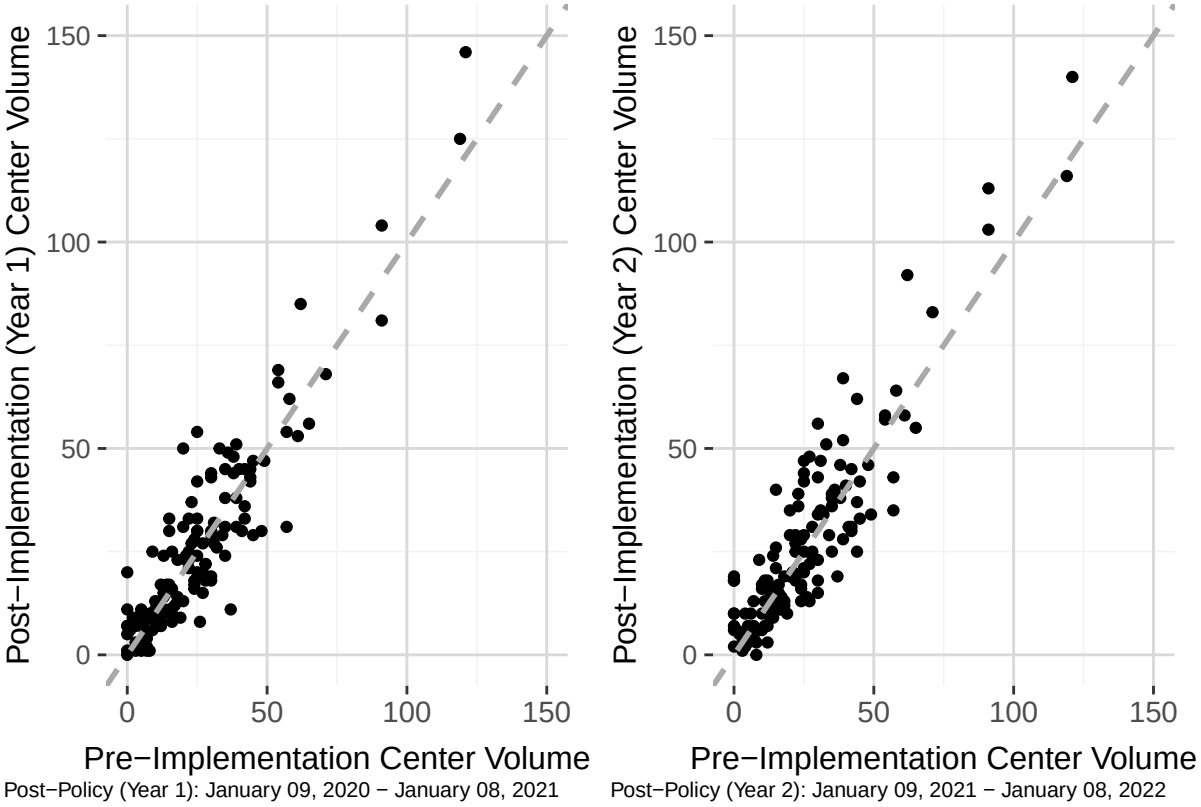
Table 11. Heart Transplants by Geographic Area

		Pre-Policy		Post-Policy (Year 1)		Post-Policy (Year 2)		Post-Policy (Overall)	
Age Group	**Geographic Area**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Pediatric	Midwest	149	28.7%	150	31.3%	140	27.9%	290	29.6%
	Northeast	85	16.4%	60	12.5%	80	15.9%	140	14.3%
	South/Southeast	183	35.3%	176	36.7%	200	39.8%	376	38.3%
	West	102	19.7%	93	19.4%	82	16.3%	175	17.8%
Adult	Midwest	733	24.2%	752	23.5%	768	23.3%	1520	23.4%
	Northeast	699	23.1%	694	21.7%	732	22.2%	1426	22%
	South/Southeast	1018	33.6%	1119	35%	1132	34.4%	2251	34.7%
	West	581	19.2%	634	19.8%	663	20.1%	1297	20%
Overall	Midwest	882	24.8%	902	24.5%	908	23.9%	1810	24.2%
	Northeast	784	22.1%	754	20.5%	812	21.4%	1566	20.9%
	South/Southeast	1201	33.8%	1295	35.2%	1332	35.1%	2627	35.1%
	West	683	19.2%	727	19.8%	745	19.6%	1472	19.7%

Pre-Policy: January 08, 2019 - January 08, 2020;
Post-Policy (Year 1): January 09, 2020 - January 08, 2021;
Post-Policy (Year 2): January 09, 2021 - January 08, 2022;
Post-Policy (Overall): January 09, 2020 - January 08, 2022

Figure 15 compares the number of heart transplants performed by transplant centers pre-policy and post-policy. This figure contains roughly 22 months of COVID-Era data and should be interpreted with caution as certain centers are known to have been significantly impacted by COVID-19. Dots that fall below the diagonal gray line represent centers where transplant volume decreased post-implementation, while those above the line performed more transplants in the year post-implementation. There were 145 transplant centers that performed at least one heart transplant in the pre- and post-policy eras. Of those, 78 performed the same number or more heart transplants in the first year post-implementation than they did pre-implementation; 78 performed the same number or more heart transplants in the second year post-implementation than they did pre-implementation. There were 67 centers that performed fewer heart transplants in the first year post-implementation, with 38 doing more than 25% fewer transplants in the first year post-implementation. Similarly, 67 centers performed fewer heart transplants in the second year post-implementation, with 36 doing more than 25% fewer transplants in the second year post-implementation.

Figure 16. Center Heart Transplant Volume by Era



Post−Policy (Year 1): January 09, 2020 − January 08, 2021

Post−Policy (Year 2): January 09, 2021 − January 08, 2022

Figure 17. Distribution of Distance Between Donor Hospital and Transplant Center

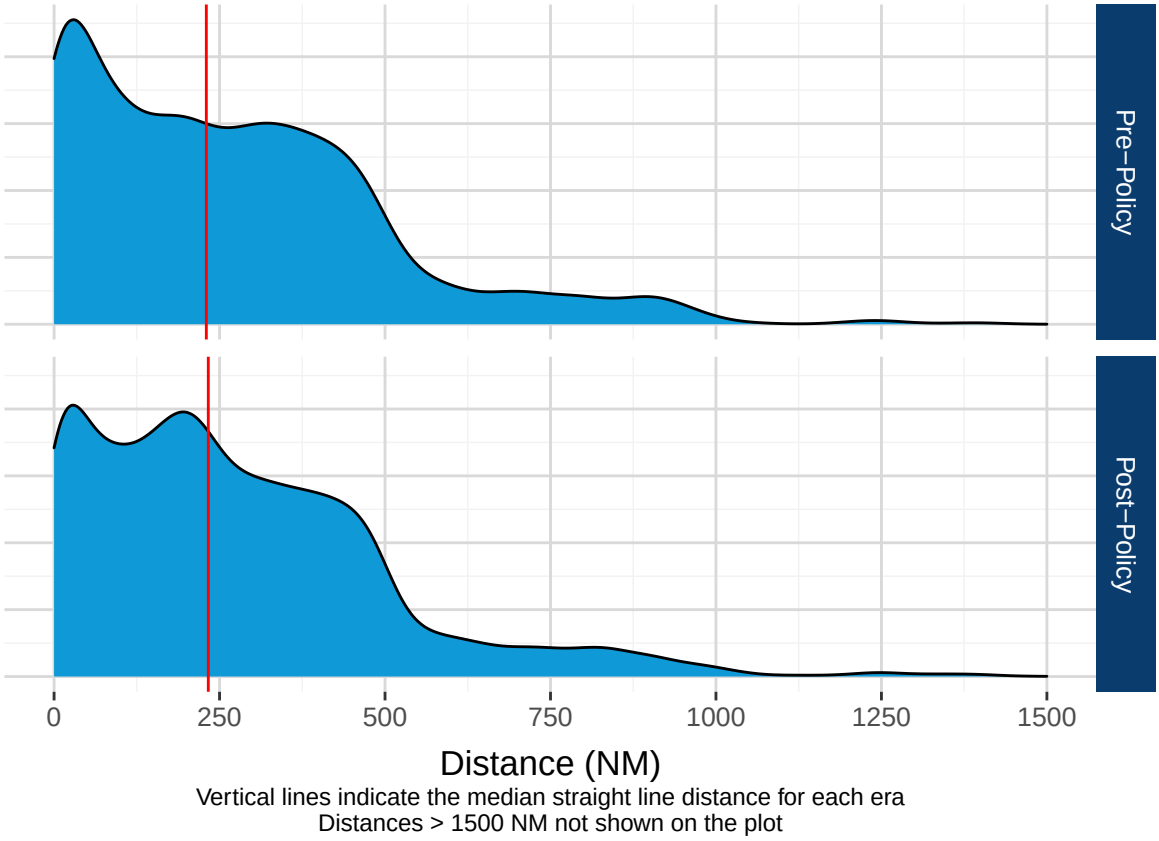


Table 12. Distance Between Donor Hospital and Transplant Center

Era	Min	IQR	Mean	Median	Max
Pre	**0**	**326.00**	**270.97**	**230**	**1402**
Post (Year 1)	0	304.75	272.08	223	1761
Post (Year 2)	0	296.00	288.87	248	2215
Post-Policy (Overall)	**0**	**303.00**	**280.61**	**233**	**2215**

Pre-Policy: January 08, 2019 - January 08, 2020;
Post-Policy (Year 1): January 09, 2020 - January 08, 2021;
Post-Policy (Year 2): January 09, 2021 - January 08, 2022;
Post-Policy (Overall): January 09, 2020 - January 08, 2022

Figure 17 and Table 12 show the distributions of distance traveled by era. Here, distance refers to the total straight line distance between the donor hospital and the transplant center in nautical miles. The median distance traveled increased slightly from 230 pre-implementation to 233 post-implementation. More specifically, the decrease in median travel distance seen in the first year post-policy was offset by a somewhat larger increase in median travel distance in the second year post-policy. More hearts were shared between 125 and 250 nautical miles post-implementation. The inter-quartile range (IQR) is the difference between the 75th percentile and the 25th percentile and represents the middle 50% of the observations. The IQR decreased from 326 pre-implementation to 303 post-implementation. This indicates the middle 50% of observations are closer together post-implementation compared to pre-implementation. These results were consistent in the first two post-policy years.

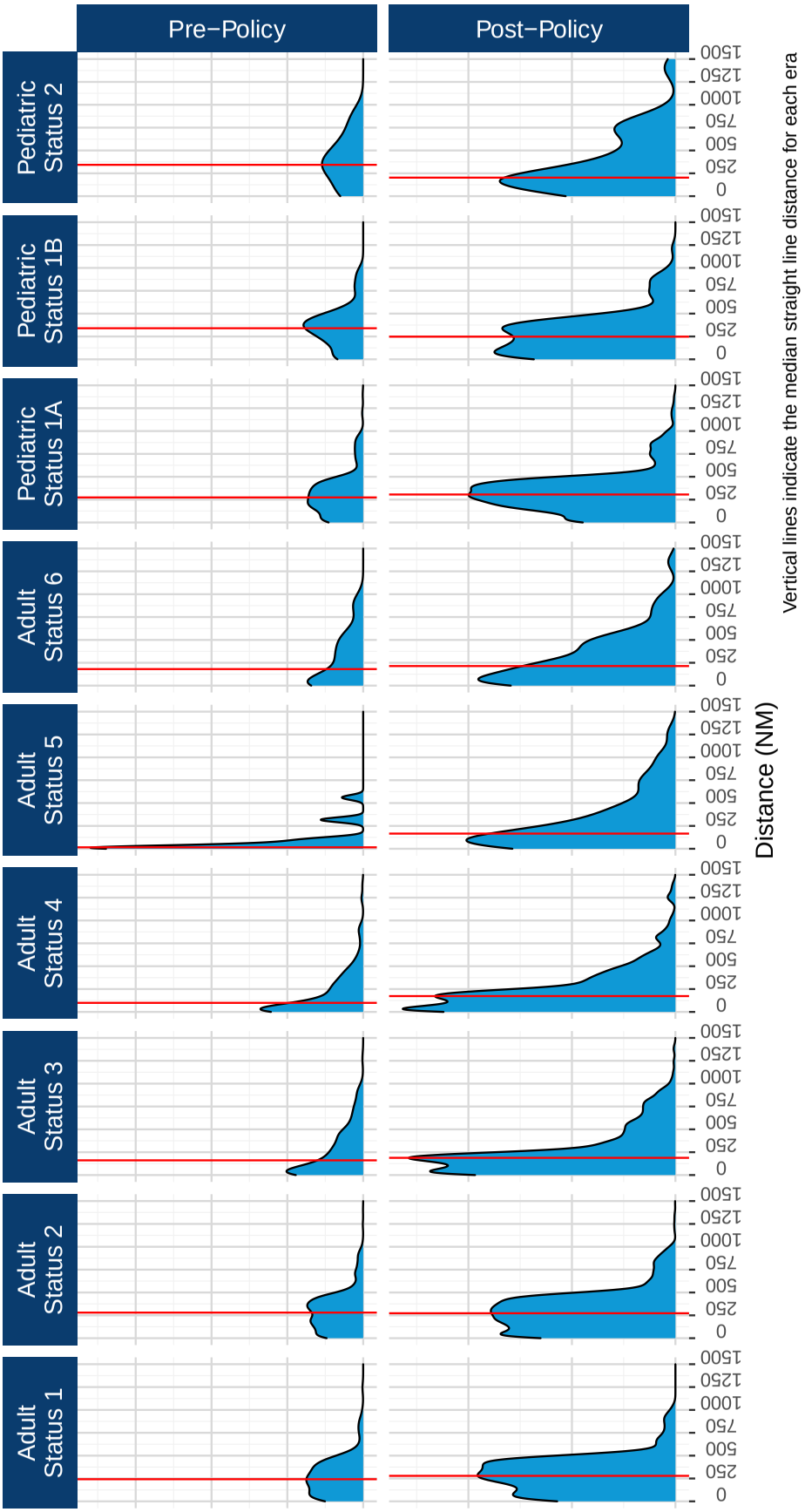


Figure 18. Distribution of Distance Between Donor Hospital and Transplant Center by Medical Urgency Status

Table 13. Distribution of Distance Between Donor Hospital and Transplant Center by Medical Urgency Status

	Pre-Policy		Post-Policy (Year 1)		Post-Policy (Year 2)		Post-Policy (Overall)	
Status	Median	IQR	Median	IQR	Median	IQR	Median	IQR
Pediatric Status 1A	274	275.0	309.5	253.5	303.0	249.0	306.0	252.0
Pediatric Status 1B	340	267.0	234.0	304.0	267.5	319.0	248.0	291.0
Pediatric Status 2	343	342.0	284.0	416.5	170.0	42.0	203.0	348.0
Adult Status 1	242	284.0	280.0	307.0	277.0	265.2	279.0	286.5
Adult Status 2	280	284.5	268.5	292.0	275.0	282.0	273.0	287.0
Adult Status 3	161	371.5	178.0	245.2	198.5	311.2	188.5	255.5
Adult Status 4	99	279.5	165.0	254.5	181.0	276.8	173.0	268.0
Adult Status 5	16	74.0	112.5	243.0	191.0	341.2	166.0	330.8
Adult Status 6	181	447.0	177.0	366.0	265.0	409.5	214.0	376.5

Pre-Policy: January 08, 2019 - January 08, 2020;
Post-Policy (Year 1): January 09, 2020 - January 08, 2021;
Post-Policy (Year 2): January 09, 2021 - January 08, 2022;
Post-Policy (Overall): January 09, 2020 - January 08, 2022

Figure 18 and Table 13 show the distributions of distances traveled by hearts pre- and post-implementation by medical urgency statuses. Adult medical urgency statuses 1 & 2, 3 & 4 and 5 & 6 were grouped together. Median distance traveled increased for pediatric status 1A and adult statuses 3&4 and 5&6 and decreased for pediatric status 1B and 2. Median distance traveled remained similar for adult statuses 1&2. In the second year post-implementation, there was reduced sharing of pediatric status 2 hearts as can be seen by the much narrower IQR. This decrease offsets the increase in sharing of pediatric status 2 hearts seen in the first year post-implementation.

Figure 19. Total Ischemic Time at Transplant by Era

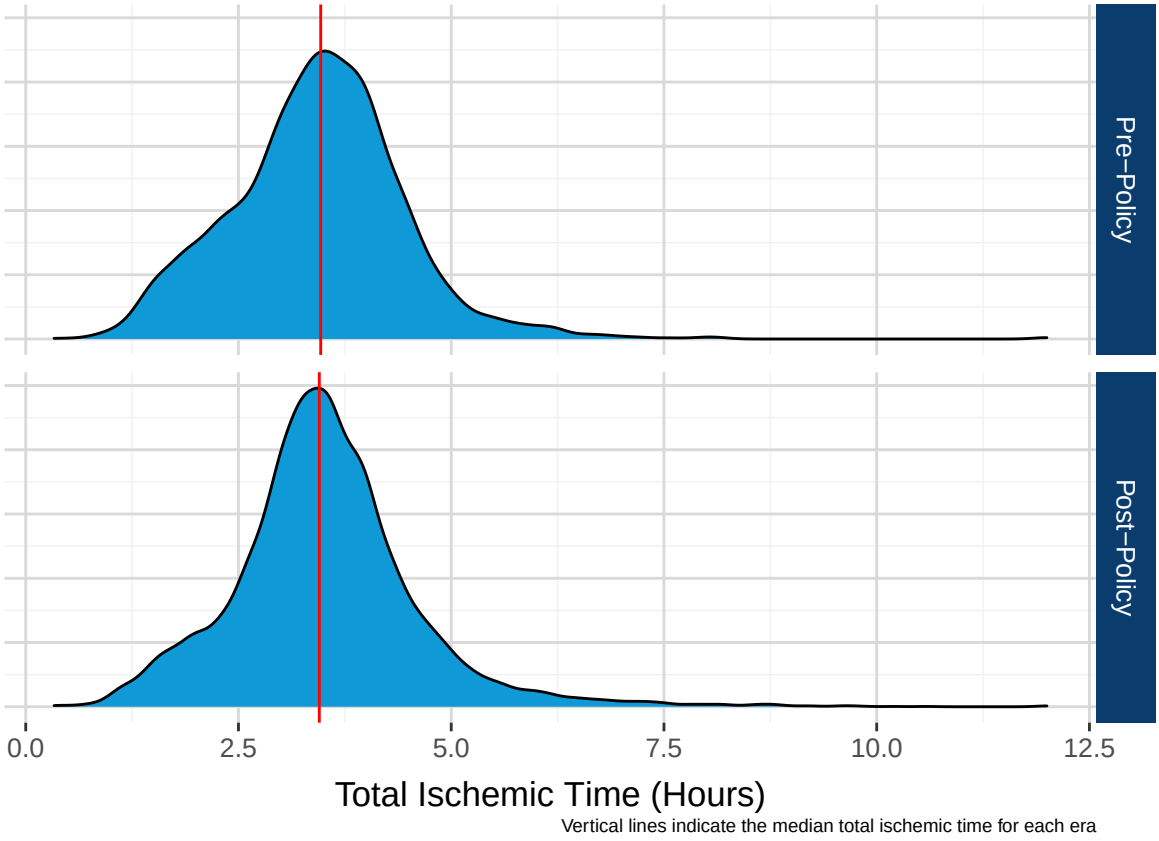


Table 14. Total Ischemic Time at Transplant by Era

Era	Min	IQR	Mean	Median	Max
Pre	**0.33**	**1.22**	**3.44**	**3.47**	**12**
Post (Year 1)	0.35	1.12	3.45	3.40	12
Post (Year 2)	0.35	1.10	3.58	3.52	12
Post-Policy (Overall)	**0.35**	**1.12**	**3.52**	**3.45**	**12**

Note:
Pre-Policy: January 08, 2019 - January 08, 2020;
Post-Policy (Year 1): January 09, 2020 - January 08, 2021;
Post-Policy (Year 2): January 09, 2021 - January 08, 2022;
Post-Policy (Overall): January 09, 2020 - January 08, 2022

Figure 19 and Table 14 show the distribution of total ischemic times at transplant both pre- and post-implementation, where total ischemic time is defined as the sum of cold ischemic time, warm ischemic time, and anastomotic time. Total ischemic times stayed roughly the same, with a median ischemic time of 3.47 hours pre-implementation, compared to a median ischemic time of 3.45 hours post-implementation. The IQR decreased slightly from 1.22 pre-implementation to 1.12 post-implementation, indicating that the middle 50% of ischemic times were closer together post-implementation. This can be seen by the sharper, more distinguished peak in the post-implementation distributions compared to the pre-implementation distribution. Similar patterns were seen when the post-policy period was stratified by year.

Figure 20. Ischemic Time by Distance Traveled Pre- and Post-Implementation

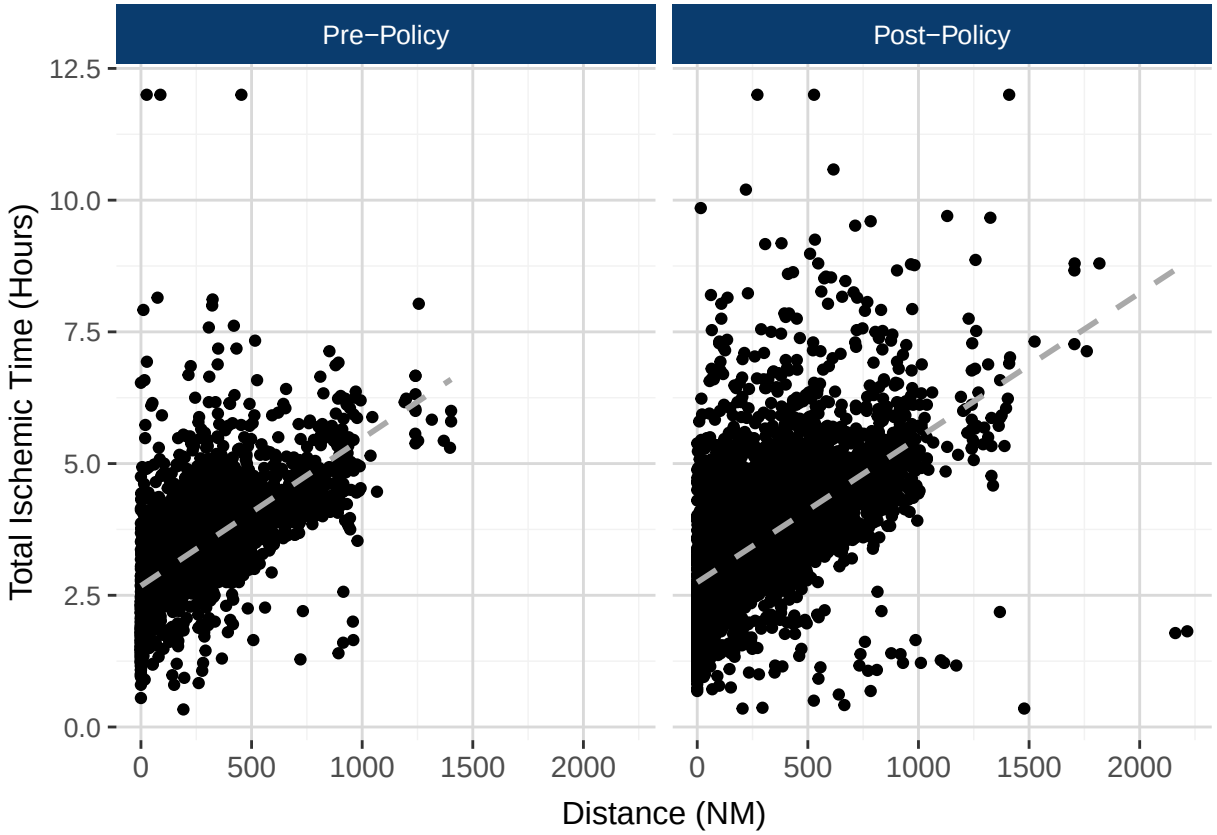


Figure 20 shows the total ischemic time by distance traveled pre- and post-implementation. As distance increased, ischemic time increased at approximately the same rate pre- and post-implementation. The Pearson correlation between distance and ischemic time was 0.63 pre-implementation and 0.59 post-implementation. Similar results were seen when the post-policy period was stratified by year.

Figure 21. Boxplot of the Sequence Number of the Acceptor for Adult Hearts

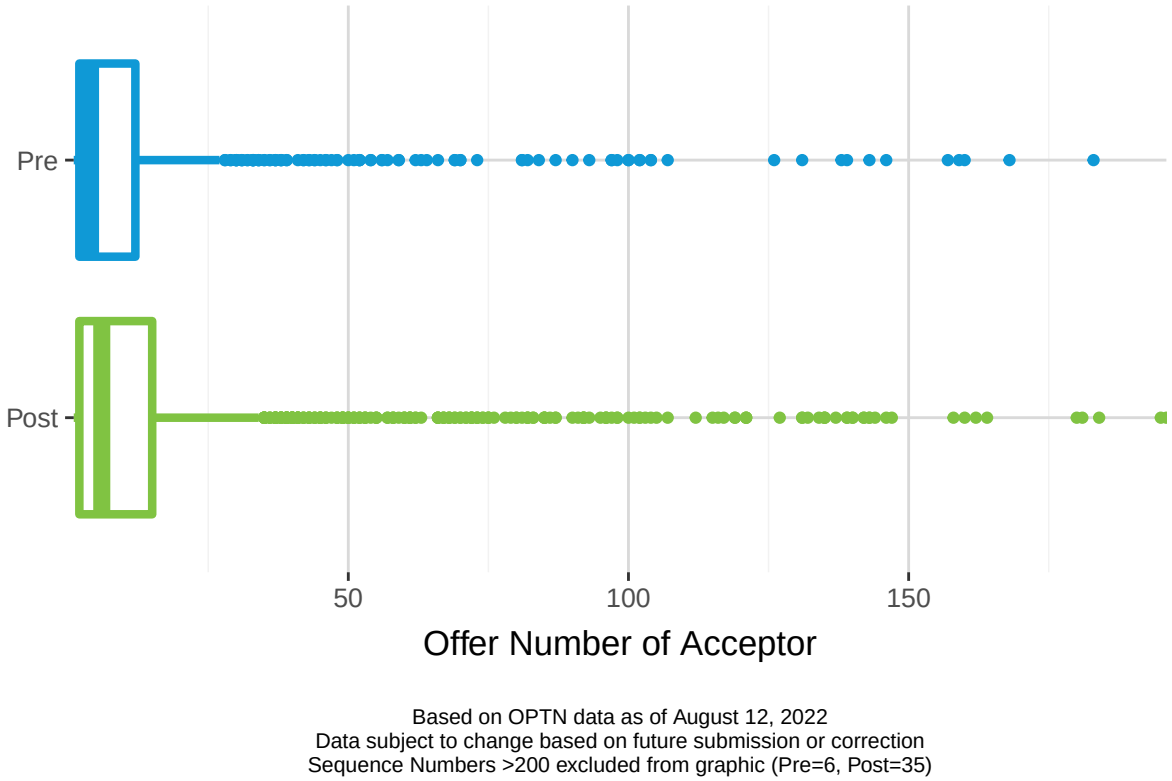


Table 15. Summary of the Sequence Number of the Final Acceptor for Adult Heart Donors

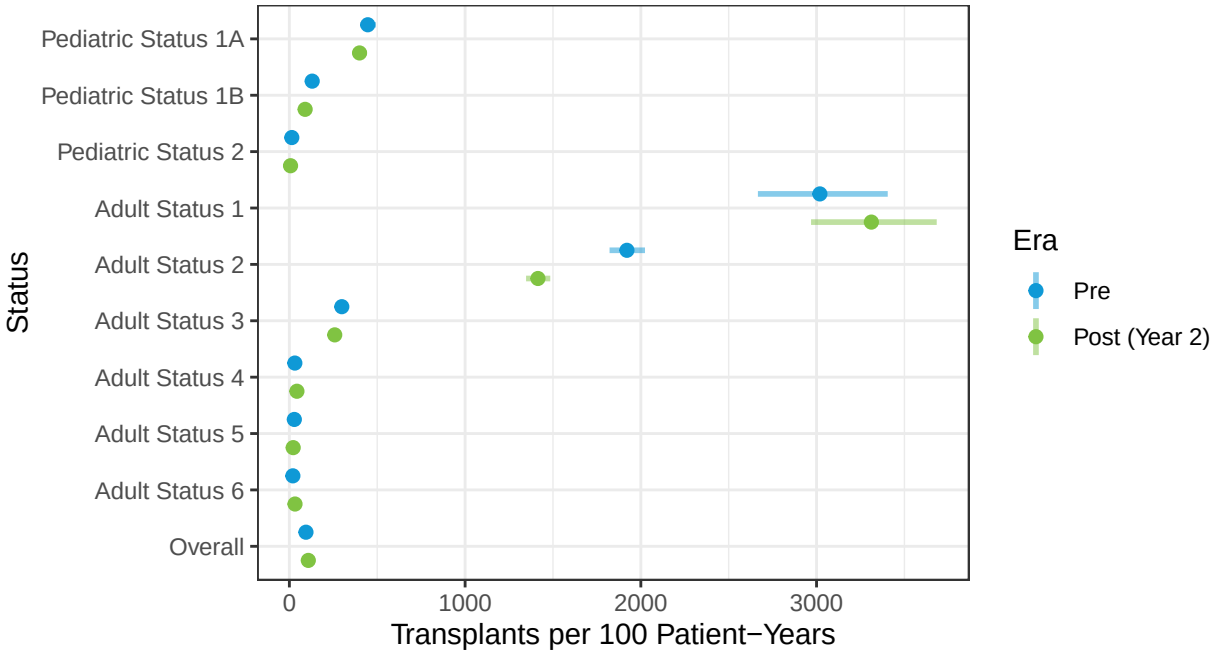
Era	Min	IQR	Mean	Median	Max
Pre-Policy	**1**	**11**	**15.51**	**4**	**660**
Post-Policy (Year 1)	1	15	19.79	5	499
Post-Policy (Year 2)	1	14	25.14	6	1245
Post-Policy (Overall)	**1**	**14**	**22.63**	**6**	**1245**

Note:
Based on OPTN data as of August 12, 2022
Data subject to change based on future submission or correction
Pre-Policy: January 08, 2019 - January 08, 2020;
Post-Policy (Year 1): January 09, 2020 - January 08, 2021;
Post-Policy (Year 2): January 09, 2021 - January 08, 2022;
Post-Policy (Overall): January 09, 2020 - January 08, 2022

Figure 21 and Table 15 show the distribution of sequence numbers for the final acceptors of hearts both pre- and post-implementation. The median sequence number was higher post-implementation. The maximum was smaller in the first year post-implementation, but larger in the second year post-implementation. The IQR was larger post-implementation compared to pre-implementation, indicating that the middle 50% of sequence numbers were farther apart post-implementation (Figure 21).

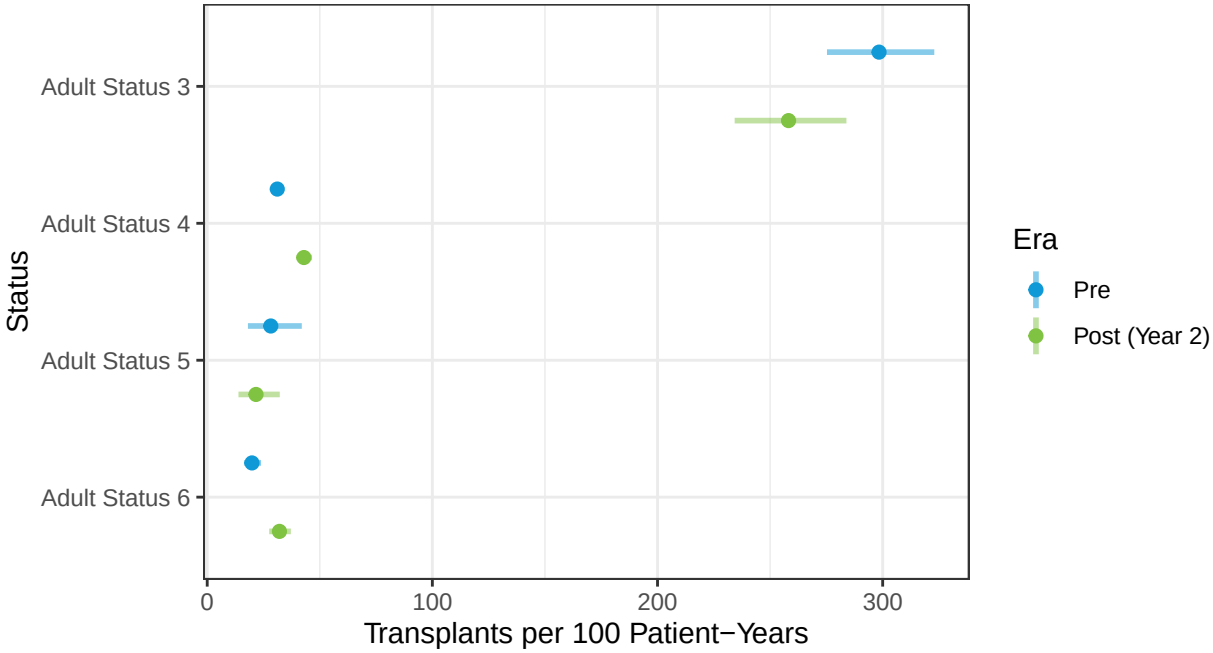
Figures 22 and 23 and Table 16 show the transplant rate overall and by medical urgency status for the pre-policy era and the second year post-policy. Only the second post-policy year was included in these analyses to ensure comparability with the pre-policy period in terms of cohort duration and seasonality. Overall there was a significant increase in the transplant rate in the second year post-policy as can be seen by the non-overlapping confidence intervals in Table 16. There were no significant differences in pediatric transplant rates for any status. Transplant rates were significantly higher in the second year post-policy for adult statuses 4 and 6, and significantly lower in the second year post-policy for adult status 2.

Figure 22. Transplants per 100 Patient-Years Waiting by Medical Urgency Status and Era



Based on OPTN data as of August 12, 2022
Data subject to change based on future data submission or correction
Pre−Policy: January 08, 2019 − January 08, 2020
Post−Policy (Year 2): January 09, 2021 − January 08, 2022
Only the second post−policy year is used to ensure that the duration and seasonality of this cohort are comparable with the pre−policy era.
Repeat transplants are excluded.

Figure 23. Zooming in on Transplants per 100 Patient-Years Waiting by Medical Urgency Status and Era for Adult Statuses 3-6



Based on OPTN data as of August 12, 2022
Data subject to change based on future data submission or correction
Pre−Policy: January 08, 2019 − January 08, 2020
Post−Policy (Year 2): January 09, 2021 − January 08, 2022
Only the second post−policy year is used to ensure that the duration and seasonality of this cohort are comparable with the pre−policy era.
Repeat transplants are excluded.

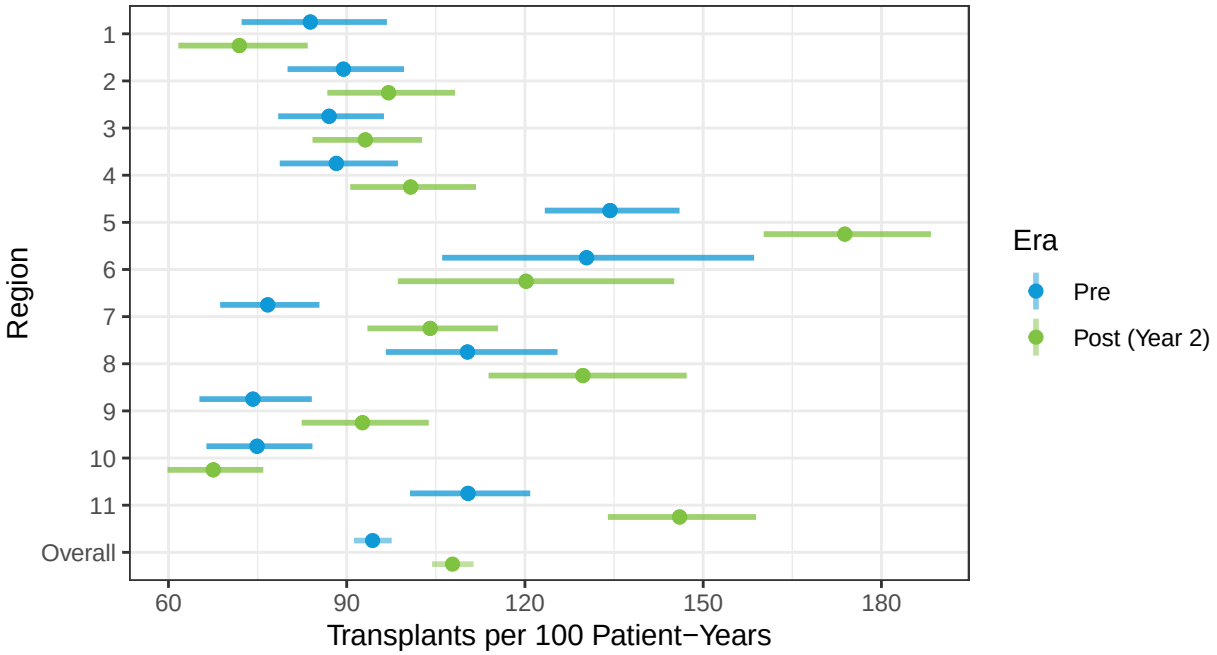
Table 16. Transplants per 100 Patient-Years Waiting by Medical Urgency Status and Era

Status	Era	Patients Ever Waiting	Transplants	Transplants per 100 Patient Years	95% CI
Pediatric Status 1A	Pre	619	399	446.21	[403.50, 492.22]
	Post (Year 2)	626	393	399.29	[360.78, 440.79]
Pediatric Status 1B	Pre	296	76	129.84	[102.30, 162.52]
	Post (Year 2)	335	80	89.69	[71.12, 111.63]
Pediatric Status 2	Pre	242	16	13.86	[7.92, 22.51]
	Post (Year 2)	242	7	6.68	[2.69, 13.77]
Adult Status 1	Pre	345	265	3018.88	[2666.32, 3405.10]
	Post (Year 2)	446	339	3311.96	[2968.75, 3683.98]
Adult Status 2	Pre	1805	1412	1920.91	[1822.01, 2023.78]
	Post (Year 2)	2170	1639	1414.53	[1346.87, 1484.71]
Adult Status 3	Pre	1935	615	298.38	[275.26, 322.92]
	Post (Year 2)	1378	426	258.19	[234.25, 283.91]
Adult Status 4	Pre	3764	500	31.12	[28.45, 33.97]
	Post (Year 2)	3301	592	42.95	[39.56, 46.55]
Adult Status 5	Pre	261	24	28.23	[18.09, 42.01]
	Post (Year 2)	318	24	21.66	[13.88, 32.23]
Adult Status 6	Pre	1740	113	19.88	[16.38, 23.90]
	Post (Year 2)	1559	178	32.08	[27.54, 37.16]
Overall	Pre	7975	3420	94.36	[91.22, 97.57]
	Post (Year 2)	8045	3678	107.81	[104.35, 111.35]

Based on OPTN data as of August 12, 2022
Data subject to change based on future data submission or correction
Pre-Policy: January 08, 2019 - January 08, 2020;
Post-Policy (Year 2): January 09, 2021 - January 08, 2022;
Only the second post-policy year is used to ensure that the duration and seasonality of this cohort are comparable with the pre-policy era.
Repeat transplants are excluded.

Figure 24 and Table 17 show the transplant rate overall and by region. Overall there was a significant increase in the transplant rate in the second year post-policy. Transplant rates were significantly higher in the second year post-policy for regions 5, 7, and 11.

Figure 24. Transplants per 100 Patient-Years Waiting by Region and Era



Based on OPTN data as of August 12, 2022
Data subject to change based on future data submission or correction
Pre−Policy: January 08, 2019 − January 08, 2020
Post−Policy (Year 2): January 09, 2021 − January 08, 2022
Only the second post−policy year is used to ensure that the duration and seasonality of this cohort are comparable with the pre−policy era.
Repeat transplants are excluded.

Table 17. Transplants per 100 Patient-Years Waiting by Region and Era

Region	Era	Patients Ever Waiting	Transplants	Transplants per 100 Patient Years	CI
1	Pre	447	188	83.88	[72.31, 96.76]
	Post (Year 2)	473	175	71.94	[61.68, 83.43]
2	Pre	811	330	89.44	[80.05, 99.63]
	Post (Year 2)	751	323	97.04	[86.75, 108.22]
3	Pre	958	378	87.04	[78.48, 96.27]
	Post (Year 2)	1005	403	93.13	[84.26, 102.68]
4	Pre	796	312	88.26	[78.74, 98.62]
	Post (Year 2)	828	358	100.77	[90.60, 111.76]
5	Pre	1077	552	134.32	[123.35, 146.01]
	Post (Year 2)	1039	599	173.84	[160.19, 188.33]
6	Pre	200	100	130.37	[106.08, 158.57]
	Post (Year 2)	219	108	120.20	[98.60, 145.12]
7	Pre	831	334	76.71	[68.70, 85.39]
	Post (Year 2)	788	355	104.04	[93.50, 115.45]
8	Pre	499	232	110.32	[96.58, 125.47]
	Post (Year 2)	493	241	129.76	[113.89, 147.22]
9	Pre	643	245	74.22	[65.22, 84.12]
	Post (Year 2)	684	298	92.65	[82.43, 103.79]
10	Pre	767	280	74.91	[66.39, 84.22]
	Post (Year 2)	797	279	67.54	[59.85, 75.95]
11	Pre	1022	469	110.42	[100.65, 120.88]
	Post (Year 2)	1030	539	146.03	[133.96, 158.90]
Overall	Pre	7975	3420	94.36	[91.22, 97.57]
	Post (Year 2)	8045	3678	107.81	[104.35, 111.35]

Based on OPTN data as of August 12, 2022
Data subject to change based on future data submission or correction
Pre-Policy: January 08, 2019 - January 08, 2020;
Post-Policy (Year 2): January 09, 2021 - January 08, 2022;
Only the second post-policy year is used to ensure that the duration and seasonality of this cohort are comparable with the pre-policy era.
Repeat transplants are excluded.

The following set of figures examines one-year post-transplant patient survival for heart-alone transplant recipients. Recipients who received any previous transplant were excluded from this analysis, as were multi-organ transplant recipients. Figure 25 displays the one-year post-transplant patient survival for recipients transplanted between 01/08/2019 - 01/08/2020 (pre) and between 01/09/2020 - 01/08/2021 (post). There was no significant difference in one-year post-transplant patient survival between the pre- and post-policy periods (p=0.83).

Figure 25. One-Year Post-Transplant Patient Survival by Era

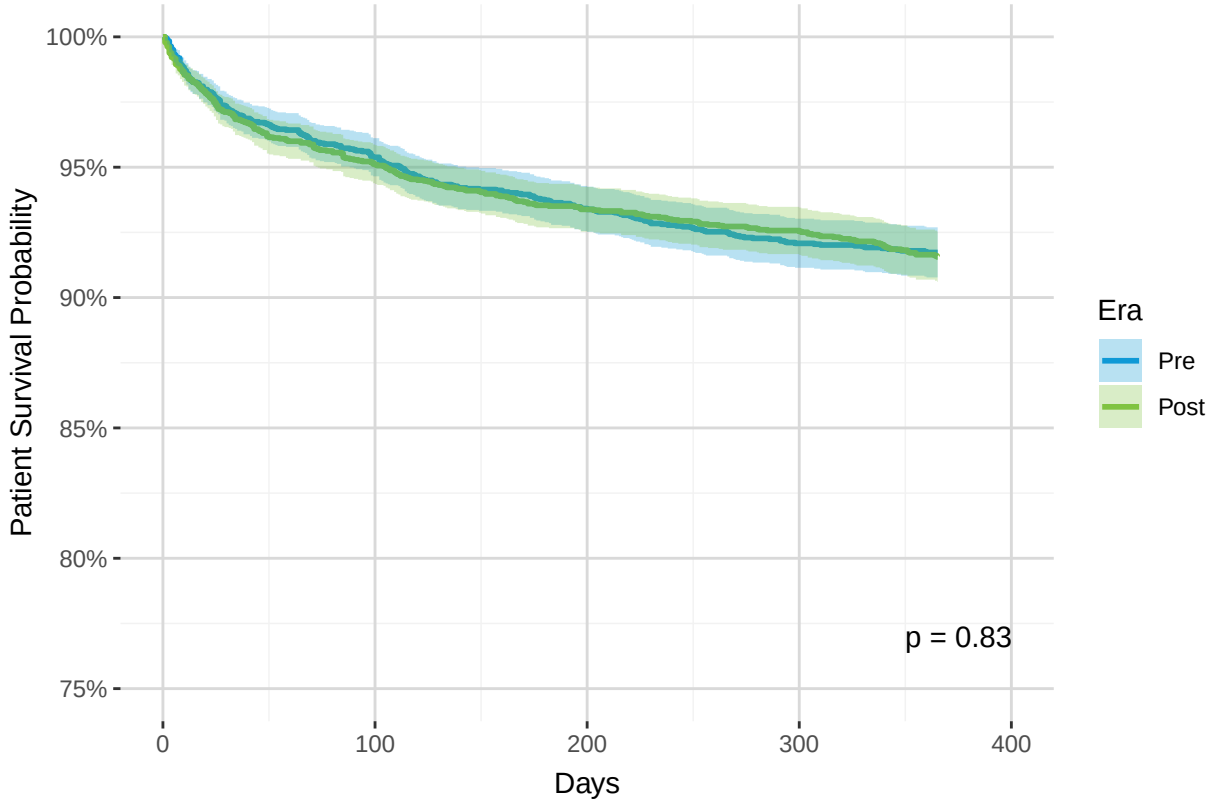
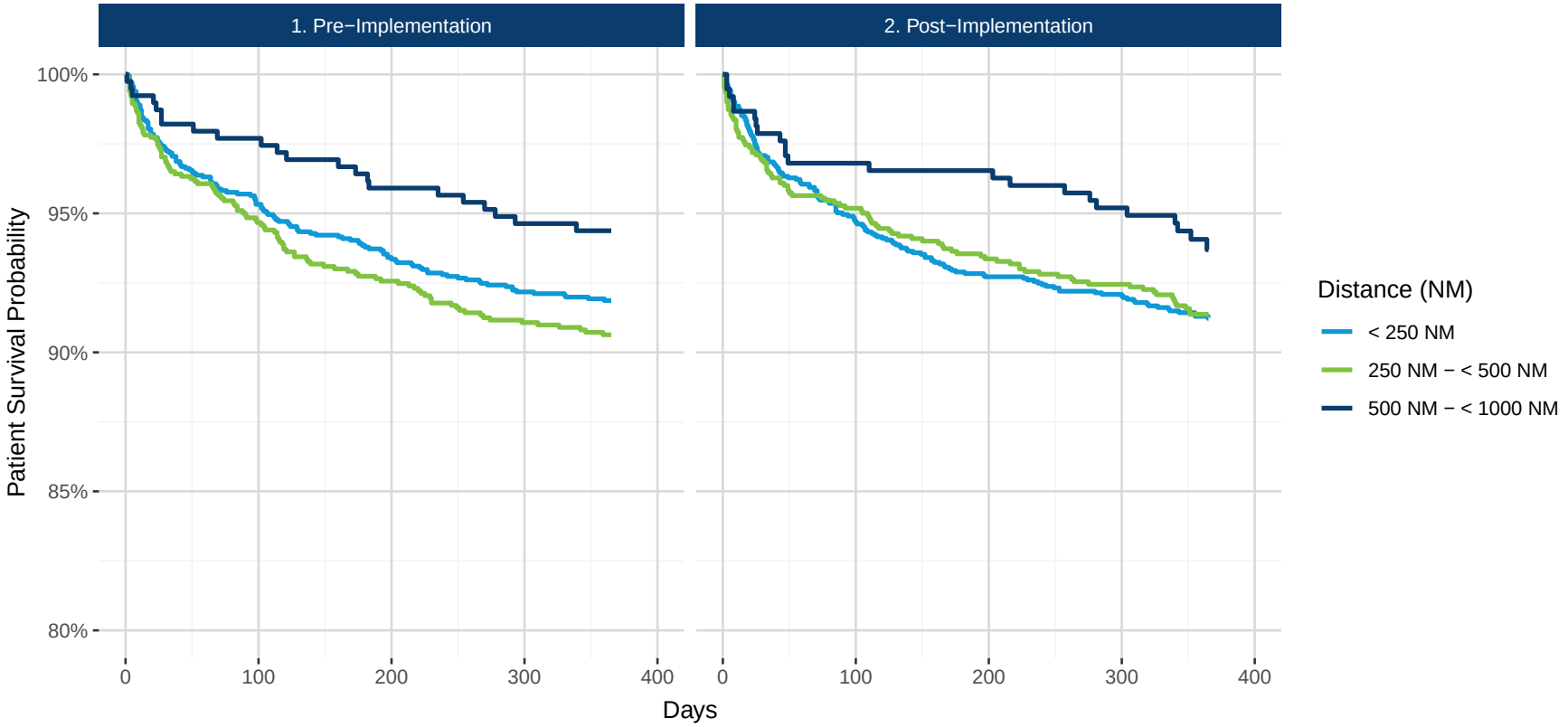


Figure 26 shows the one-year post-transplant patient survival by distance traveled. It is important to note that the post-transplant survival estimates do not adjust for factors like medical urgency status which may differ between distance groups (Figure 12). Pre-implementation recipients who received hearts that traveled 250-<500 NM had the worst one-year post-transplant survival while recipients who received hearts traveling 500-<1000NM had the best one-year post-transplant survival. Post-implementation, one-year post-transplant survival for recipients who received hearts that traveled 250-<500 NM increased slightly, aligning more closely with one-year post-transplant survival for recipients who received hearts that traveled <250 NM. As in the pre-policy period, one-year post-transplant survival for recipients of hearts traveling 500-<1000NM was better than that for recipients of hearts traveling shorter distances.

Figure 26. One-Year Post-Transplant Patient Survival by Distance Group and Era



Repeat transplant recipients and multi−organ transplant recipients are excluded.
Transplants traveling 1000−<1500 NM and 1500−<2500 NM were excluded due to insufficient sample size (see Table 8).

Utilization

This chapter examines differences in heart utilization between two donor cohorts: the 11910 deceased donors with at least one organ recovered for the purpose of transplant between January 08, 2019 and January 08, 2020 (pre-implementation); and the 26464 deceased donors with a least one organ recovered for the purpose of transplant between January 09, 2020 and January 08, 2022 (post-implementation). The post-policy period was further stratified by year: there were 12597 deceased donors with at least one organ recovered for the purpose of transplant in the first year post-policy and 13867 deceased donors with at least one organ recovered for the purpose of transplant in the second year post-policy.

Table 18 shows the heart utilization and discard rates by era overall and for pediatrics and adults. The utilization rate remained similar across eras and the discard rate remained very low across all eras.

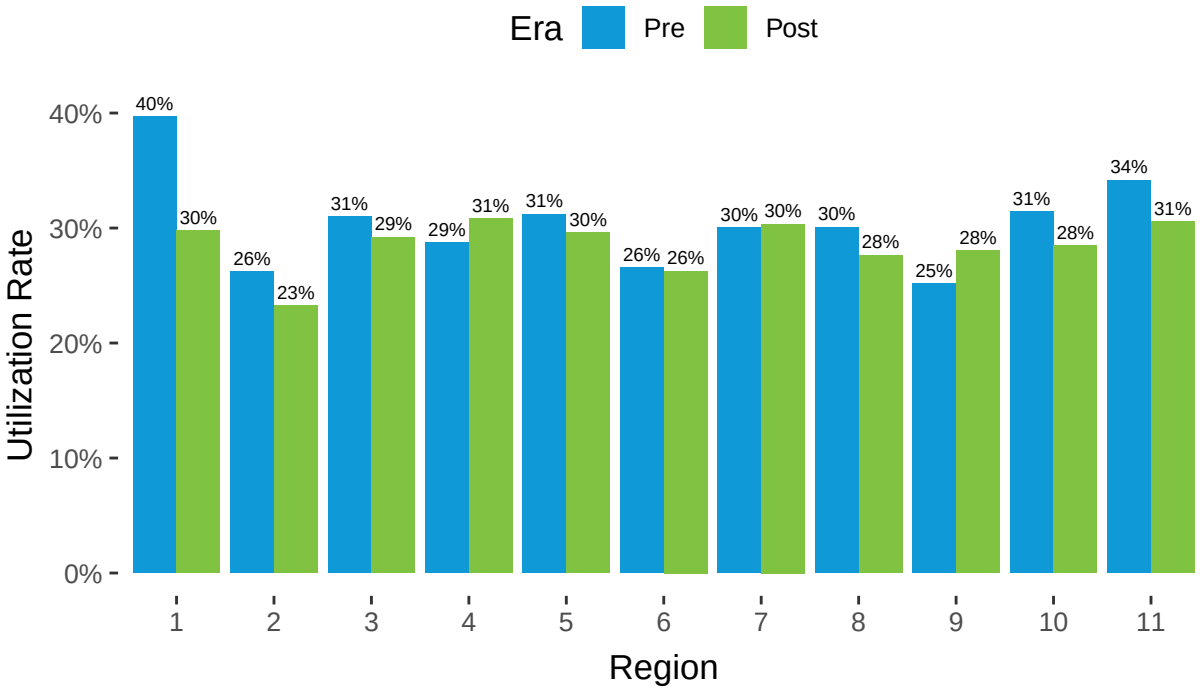
Table 18. Heart Utilization and Discard Rates by Era

Era	Ped/Adult	Utilization	Discard
Pre-Policy	Overall	30.31%	0.85%
	Adult	27.6%	0.95%
	Peds	62.91%	0.35%
Post-Policy (Year 1)	Overall	29.67%	1.01%
	Adult	27.43%	1.08%
	Peds	59.95%	0.57%
Post-Policy (Year 2)	Overall	27.71%	1%
	Adult	25.69%	1.16%
	Peds	55.94%	0%
Post-Policy (Overall)	Overall	28.64%	1.01%
	Adult	26.85%	1.06%
	Peds	59.58%	0.31%

Based on OPTN data as of August 12, 2022
Data subject to change based on future submission or correction
Pre-Policy: January 08, 2019 - January 08, 2020;
Post-Policy (Year 1): January 09, 2020 - January 08, 2021;
Post-Policy (Year 2): January 09, 2021 - January 08, 2022;
Post-Policy (Overall): January 09, 2020 - January 08, 2022

Figure 27 shows the heart utilization rates by region and era. The largest decrease in utilization occurred in Region 1 with a roughly 10% decrease.

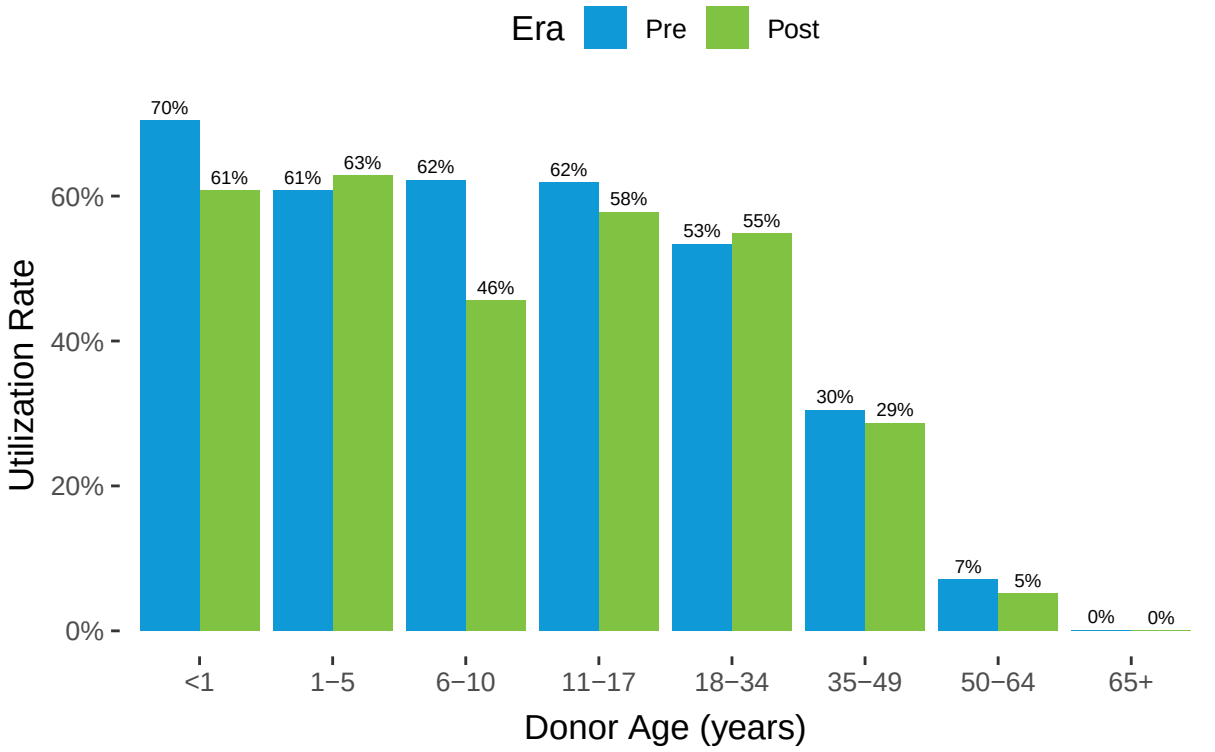
Figure 27. Heart Utilization Rates by Region and Era



Based on OPTN data as of August 12, 2022
Data subject to change based on future data submission or correction
Pre−Policy: January 08, 2019 − January 08, 2020;
Post−Policy: January 09, 2020 − January 08, 2022

Figure 28 and Table 19 show the heart utilization rates by donor age and era. Utilization was highest in ages <1 year pre- and post-implementation and lowest in the over 50 years age groups. Utilization remained similar pre- to post-implementation in all age groups except for ages <1, where it decreased by 9%; and ages 6-10, where it decreased by 16%. These decreases may be partially attributable to the small number of donors in these age groups (see Table 19).

Figure 28. Heart Utilization Rates by Donor Age and Era



Based on OPTN data as of August 12, 2022
Data subject to change based on future data submission or correction

Table 19. Heart Utilization Rates by Donor Age and Era

Age	Era	Number of Deceased Donor Hearts Transplanted	Total Number of Deceased Donors Recovered	Utilization
<1	Pre	93	132	70%
	Post	150	247	61%
1-5	Pre	127	209	61%
	Post	255	406	63%
6-10	Pre	79	127	62%
	Post	98	215	46%
11-17	Pre	276	446	62%
	Post	536	927	58%
18-34	Pre	1769	3315	53%
	Post	3906	7120	55%
35-49	Pre	1019	3345	30%
	Post	2222	7749	29%
50-64	Pre	246	3465	7%
	Post	412	8008	5%
65+	Pre	1	871	0%
	Post	1	1792	0%

Based on OPTN data as of August 12, 2022

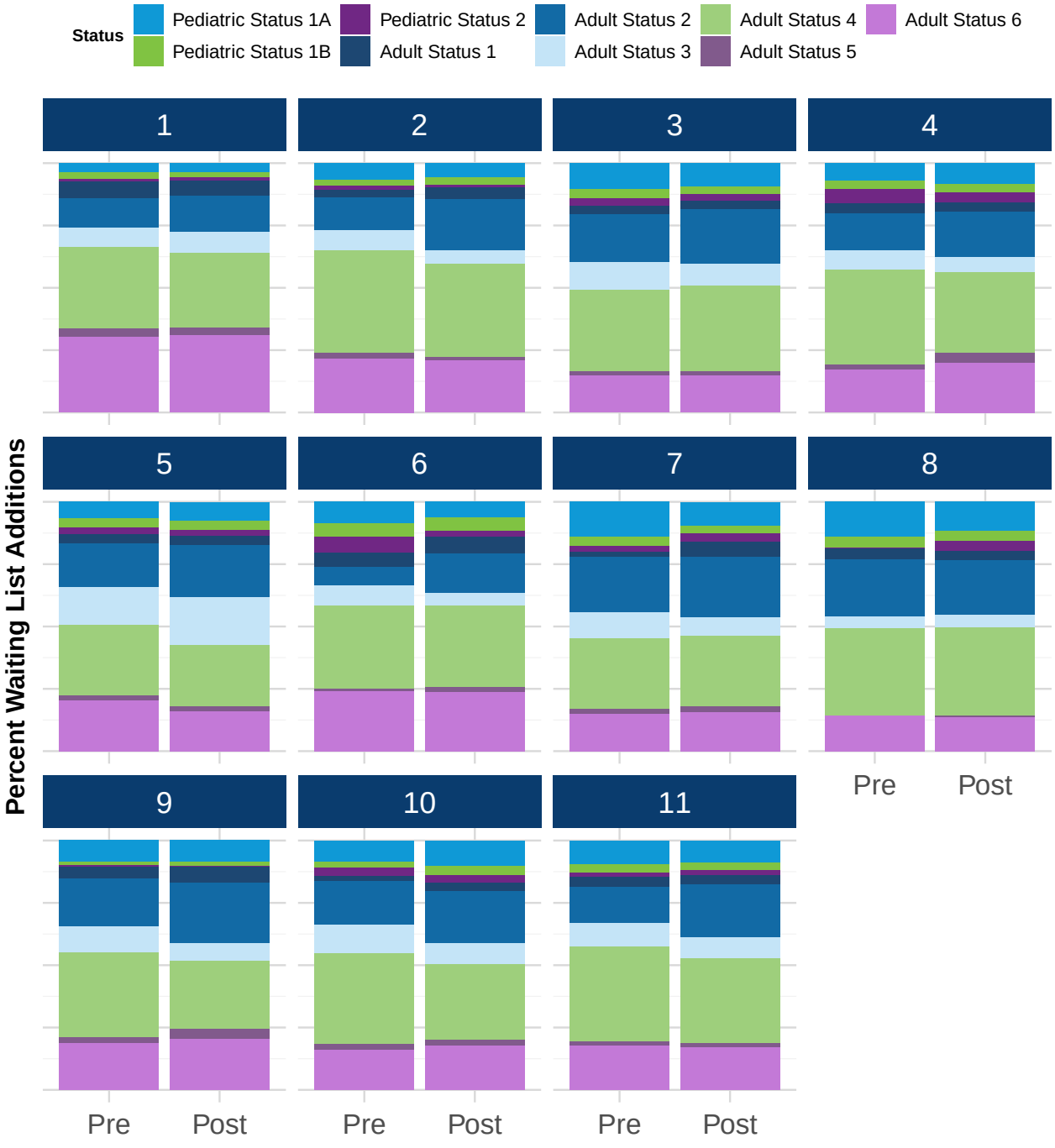
Data subject to change based on future submission or correction

Summary

Two years of monitoring the removal of DSA from heart allocation suggests that there were no major unintended impacts of the policy to heart allocation. More heart transplants were performed between 125-250 NM from the donor hospital. As expected, slightly fewer heart transplants occurred locally (within the same DSA) and more occurred regionally (different DSAs but the same region). Post-implementation, the median distance traveled increased slightly overall, offsetting the decrease seen in the first year post-policy. Median distance traveled also increased for less medically urgent adult heart candidates and more medically urgent pediatric candidates post-policy. While the removal of DSA from heart allocation appears to have affected the distances hearts are traveling, the removal did not appear to significantly affect total ischemic time nor has there been an increase in candidates removed from the waiting list due to death or being too sick to transplant. Waitlist mortality rates did not differ between eras. Transplants rates, on the other hand, increased significantly post-implementation, particularly for adult statuses 4 and 6. There were no significant differences in one-year post-transplant survival overall.

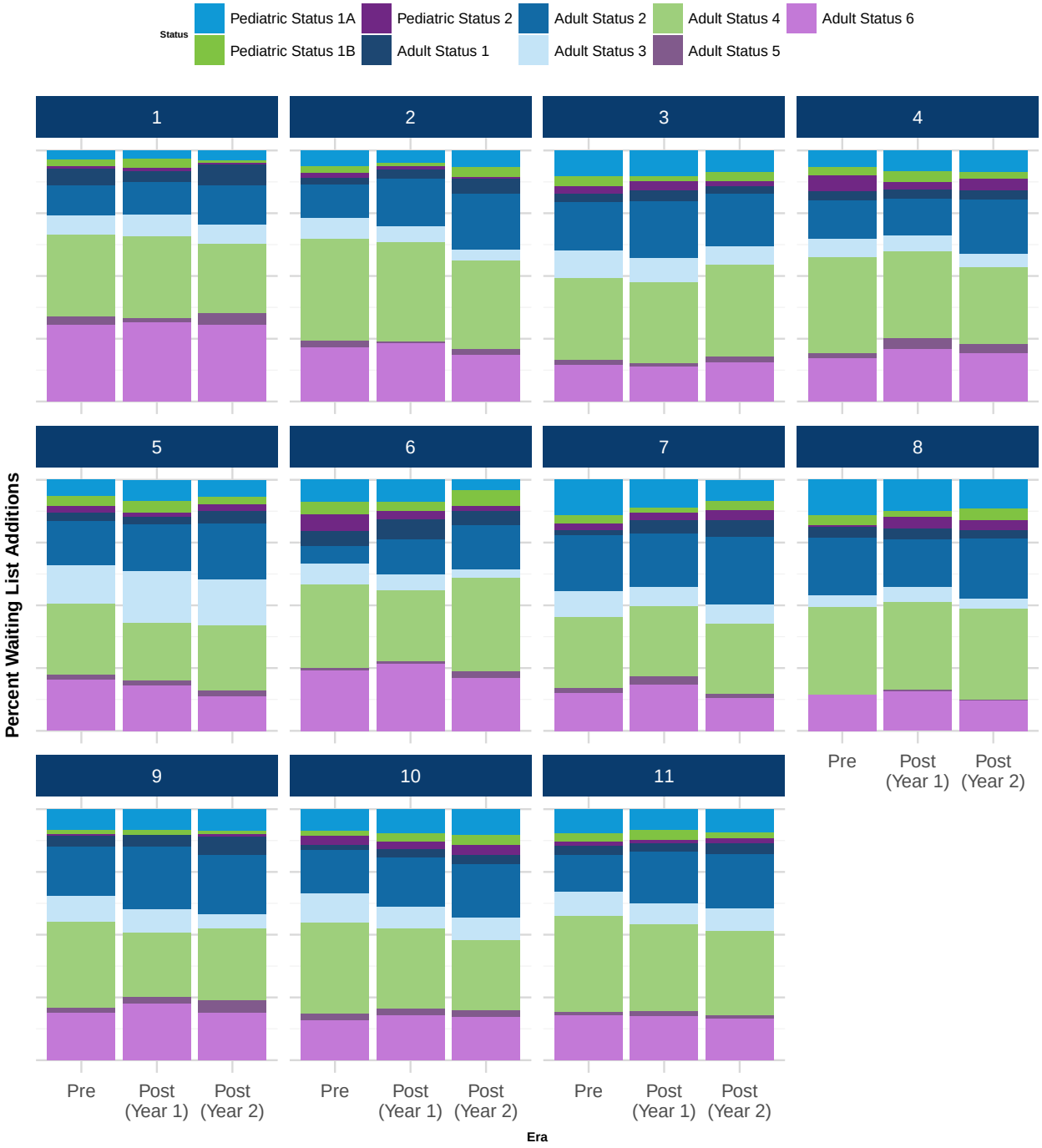
Appendix

Figure A1. Waiting List Additions by Region, Medical Urgency Status and Era



Statuses representing <5% of the total are not labeled on the plot
Temporarily Inactive Statuses Excluded

Figure A1b. Waiting List Additions by Region, Medical Urgency Status and Era (with post−policy era stratified by year)



Statuses representing <5% of the total are not labeled on the plot
Temporarily Inactive Statuses Excluded

Table A1: Waitlist Additions by Region and Medical Urgency Status Pre-Implementation

Region		Adult Status 1	Adult Status 2	Adult Status 3	Adult Status 4	Adult Status 5	Adult Status 6	Pediatric Status 1A	Pediatric Status 1B	Pediatric Status 2	Temporarily Inactive	Total
1	N	14	25	16	68	7	63	8	5	2	5	201
	%	0.30%	0.53%	0.34%	1.46%	0.15%	1.35%	0.17%	0.11%	0.04%	0.11%	4.30%
2	N	14	62	39	193	11	102	31	11	9	2	452
	%	0.30%	1.33%	0.83%	4.13%	0.24%	2.18%	0.66%	0.24%	0.19%	0.04%	9.67%
3	N	17	99	58	168	9	75	53	20	15	3	479
	%	0.36%	2.12%	1.24%	3.60%	0.19%	1.60%	1.13%	0.43%	0.32%	0.06%	10.25%
4	N	17	68	34	171	10	77	31	15	27	11	408
	%	0.36%	1.46%	0.73%	3.66%	0.21%	1.65%	0.66%	0.32%	0.58%	0.24%	8.73%
5	N	24	117	99	188	13	134	44	25	17	13	619
	%	0.51%	2.50%	2.12%	4.02%	0.28%	2.87%	0.94%	0.53%	0.36%	0.28%	13.25%
6	N	8	10	11	46	1	33	12	7	9	2	121
	%	0.17%	0.21%	0.24%	0.98%	0.02%	0.71%	0.26%	0.15%	0.19%	0.04%	2.59%
7	N	8	93	42	117	8	62	58	15	10	8	388
	%	0.17%	1.99%	0.90%	2.50%	0.17%	1.33%	1.24%	0.32%	0.21%	0.17%	8.30%
8	N	14	71	15	109	0	45	44	13	2	5	298
	%	0.30%	1.52%	0.32%	2.33%	0.00%	0.96%	0.94%	0.28%	0.04%	0.11%	6.38%
9	N	15	64	34	113	7	62	28	5	2	1	323
	%	0.32%	1.37%	0.73%	2.42%	0.15%	1.33%	0.60%	0.11%	0.04%	0.02%	6.91%
10	N	9	72	47	151	10	66	36	9	14	14	391
	%	0.19%	1.54%	1.01%	3.23%	0.21%	1.41%	0.77%	0.19%	0.30%	0.30%	8.37%
11	N	27	99	67	261	11	122	66	23	11	10	653
	%	0.58%	2.12%	1.43%	5.59%	0.24%	2.61%	1.41%	0.49%	0.24%	0.21%	13.97%

Table A2: Waitlist Additions by Region and Medical Urgency Status Post-Implementation

Region		Adult Status 1	Adult Status 2	Adult Status 3	Adult Status 4	Adult Status 5	Adult Status 6	Pediatric Status 1A	Pediatric Status 1B	Pediatric Status 2	Temporarily Inactive	Total
1	N	30	69	39	143	15	147	18	10	5	17	461
	%	0.32%	0.73%	0.41%	1.51%	0.16%	1.55%	0.19%	0.11%	0.05%	0.18%	4.87%
2	N	41	171	46	311	13	173	49	23	8	4	804
	%	0.43%	1.81%	0.49%	3.29%	0.14%	1.83%	0.52%	0.24%	0.08%	0.04%	8.50%
3	N	42	253	101	400	22	172	110	35	31	6	1100
	%	0.44%	2.67%	1.07%	4.23%	0.23%	1.82%	1.16%	0.37%	0.33%	0.06%	11.63%
4	N	33	167	52	294	35	180	77	31	35	10	838
	%	0.35%	1.77%	0.55%	3.11%	0.37%	1.90%	0.81%	0.33%	0.37%	0.11%	8.86%
5	N	53	296	275	348	30	226	110	51	35	20	1338
	%	0.56%	3.13%	2.91%	3.68%	0.32%	2.39%	1.16%	0.54%	0.37%	0.21%	14.15%
6	N	18	43	13	89	5	64	17	14	7	4	249
	%	0.19%	0.45%	0.14%	0.94%	0.05%	0.68%	0.18%	0.15%	0.07%	0.04%	2.63%
7	N	51	206	65	239	20	133	83	24	30	9	797
	%	0.54%	2.18%	0.69%	2.53%	0.21%	1.41%	0.88%	0.25%	0.32%	0.10%	8.43%
8	N	23	132	30	216	3	83	72	23	25	8	559
	%	0.24%	1.40%	0.32%	2.28%	0.03%	0.88%	0.76%	0.24%	0.26%	0.08%	5.91%
9	N	43	169	51	190	27	143	59	12	3	1	682
	%	0.45%	1.79%	0.54%	2.01%	0.29%	1.51%	0.62%	0.13%	0.03%	0.01%	7.21%
10	N	29	174	73	254	22	148	85	31	28	13	785
	%	0.31%	1.84%	0.77%	2.69%	0.23%	1.56%	0.90%	0.33%	0.30%	0.14%	8.30%
11	N	46	272	112	435	23	218	114	39	25	9	1220
	%	0.49%	2.88%	1.18%	4.60%	0.24%	2.30%	1.21%	0.41%	0.26%	0.10%	12.90%

Table A3: Waitlist Additions by Region and Medical Urgency Status Post-Implementation (Year 1)

Region		Adult Status 1	Adult Status 2	Adult Status 3	Adult Status 4	Adult Status 5	Adult Status 6	Pediatric Status 1A	Pediatric Status 1B	Pediatric Status 2	Temporarily Inactive	Total
1	N	10	30	20	75	4	72	8	8	3	6	219
	%	0.22%	0.66%	0.44%	1.66%	0.09%	1.59%	0.18%	0.18%	0.07%	0.13%	4.85%
2	N	15	76	26	159	4	93	20	6	5	2	393
	%	0.33%	1.68%	0.58%	3.52%	0.09%	2.06%	0.44%	0.13%	0.11%	0.04%	8.70%
3	N	24	124	55	177	8	76	57	12	19	4	521
	%	0.53%	2.75%	1.22%	3.92%	0.18%	1.68%	1.26%	0.27%	0.42%	0.09%	11.53%
4	N	14	60	25	141	18	84	34	17	13	5	376
	%	0.31%	1.33%	0.55%	3.12%	0.40%	1.86%	0.75%	0.38%	0.29%	0.11%	8.32%
5	N	19	133	145	159	14	127	60	31	14	15	657
	%	0.42%	2.94%	3.21%	3.52%	0.31%	2.81%	1.33%	0.69%	0.31%	0.33%	14.55%
6	N	10	18	8	36	1	34	11	5	4	2	118
	%	0.22%	0.40%	0.18%	0.80%	0.02%	0.75%	0.24%	0.11%	0.09%	0.04%	2.61%
7	N	22	86	31	113	13	75	45	8	12	1	385
	%	0.49%	1.90%	0.69%	2.50%	0.29%	1.66%	1.00%	0.18%	0.27%	0.02%	8.52%
8	N	12	54	17	99	2	44	35	7	13	6	263
	%	0.27%	1.20%	0.38%	2.19%	0.04%	0.97%	0.77%	0.15%	0.29%	0.13%	5.82%
9	N	15	77	29	80	8	70	26	6	0	1	305
	%	0.33%	1.70%	0.64%	1.77%	0.18%	1.55%	0.58%	0.13%	0.00%	0.02%	6.75%
10	N	14	86	37	138	12	77	42	15	12	8	406
	%	0.31%	1.90%	0.82%	3.06%	0.27%	1.70%	0.93%	0.33%	0.27%	0.18%	8.99%
11	N	19	126	50	210	12	107	51	23	10	6	575
	%	0.42%	2.79%	1.11%	4.65%	0.27%	2.37%	1.13%	0.51%	0.22%	0.13%	12.73%

Table A4: Waitlist Additions by Region and Medical Urgency Status Post-Implementation (Year 2)

Region		Adult Status 1	Adult Status 2	Adult Status 3	Adult Status 4	Adult Status 5	Adult Status 6	Pediatric Status 1A	Pediatric Status 1B	Pediatric Status 2	Temporarily Inactive	Total
1	N	20	39	19	68	11	75	10	2	2	11	242
	%	0.40%	0.79%	0.38%	1.38%	0.22%	1.52%	0.20%	0.04%	0.04%	0.22%	4.90%
2	N	26	95	20	152	9	80	29	17	3	2	411
	%	0.53%	1.92%	0.40%	3.08%	0.18%	1.62%	0.59%	0.34%	0.06%	0.04%	8.32%
3	N	18	129	46	223	14	96	53	23	12	2	579
	%	0.36%	2.61%	0.93%	4.51%	0.28%	1.94%	1.07%	0.47%	0.24%	0.04%	11.72%
4	N	19	107	27	153	17	96	43	14	22	5	462
	%	0.38%	2.17%	0.55%	3.10%	0.34%	1.94%	0.87%	0.28%	0.45%	0.10%	9.35%
5	N	34	163	130	189	16	99	50	20	21	5	681
	%	0.69%	3.30%	2.63%	3.82%	0.32%	2.00%	1.01%	0.40%	0.42%	0.10%	13.78%
6	N	8	25	5	53	4	30	6	9	3	2	131
	%	0.16%	0.51%	0.10%	1.07%	0.08%	0.61%	0.12%	0.18%	0.06%	0.04%	2.65%
7	N	29	120	34	126	7	58	38	16	18	8	412
	%	0.59%	2.43%	0.69%	2.55%	0.14%	1.17%	0.77%	0.32%	0.36%	0.16%	8.34%
8	N	11	78	13	117	1	39	37	16	12	2	296
	%	0.22%	1.58%	0.26%	2.37%	0.02%	0.79%	0.75%	0.32%	0.24%	0.04%	5.99%
9	N	28	92	22	110	19	73	33	6	3	0	377
	%	0.57%	1.86%	0.45%	2.23%	0.38%	1.48%	0.67%	0.12%	0.06%	0.00%	7.63%
10	N	15	88	36	116	10	71	43	16	16	5	379
	%	0.30%	1.78%	0.73%	2.35%	0.20%	1.44%	0.87%	0.32%	0.32%	0.10%	7.67%
11	N	27	146	62	225	11	111	63	16	15	3	645
	%	0.55%	2.95%	1.25%	4.55%	0.22%	2.25%	1.27%	0.32%	0.30%	0.06%	13.05%

Figure A2. Transplants by Region, Medical Urgency Status and Era

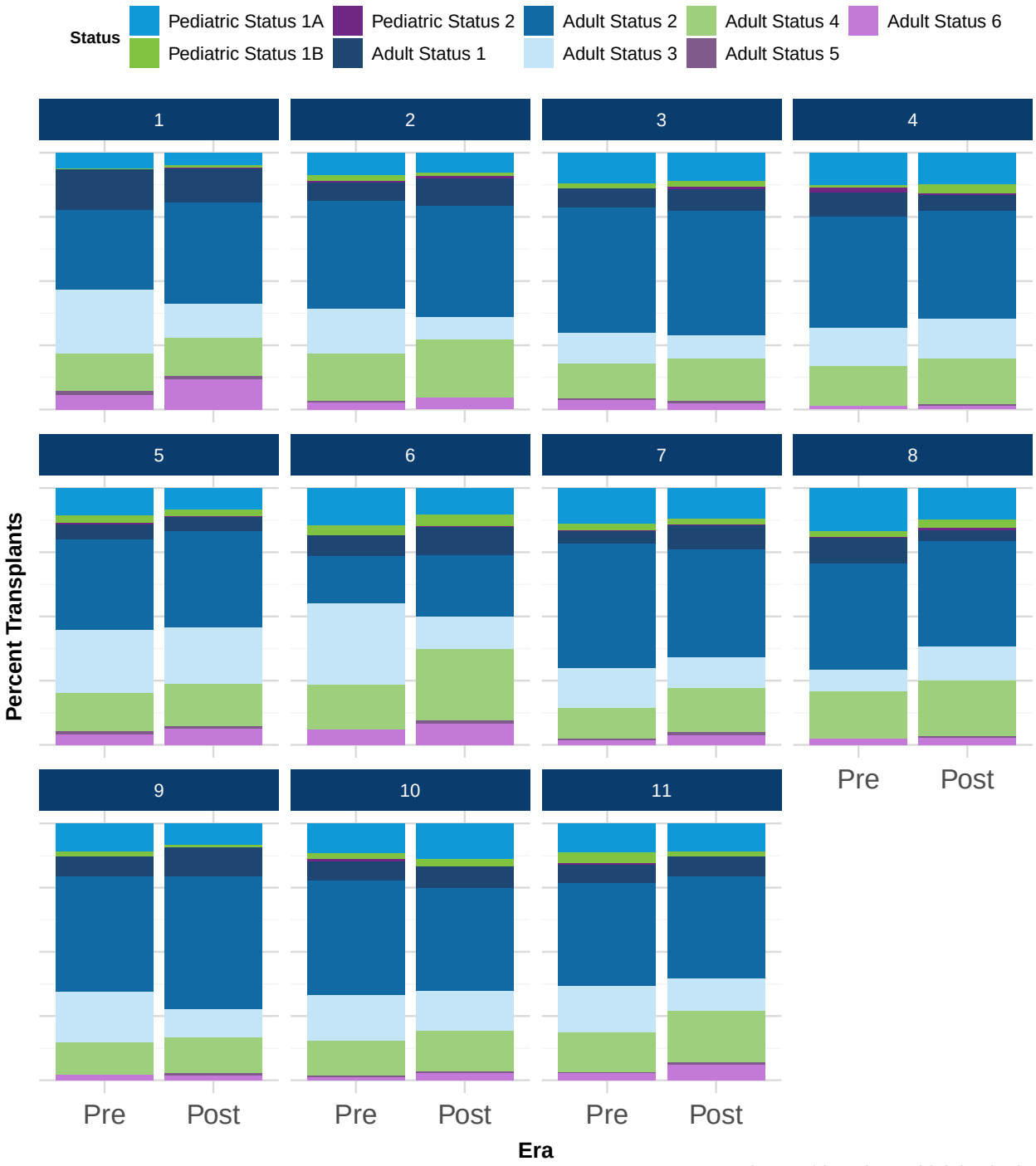
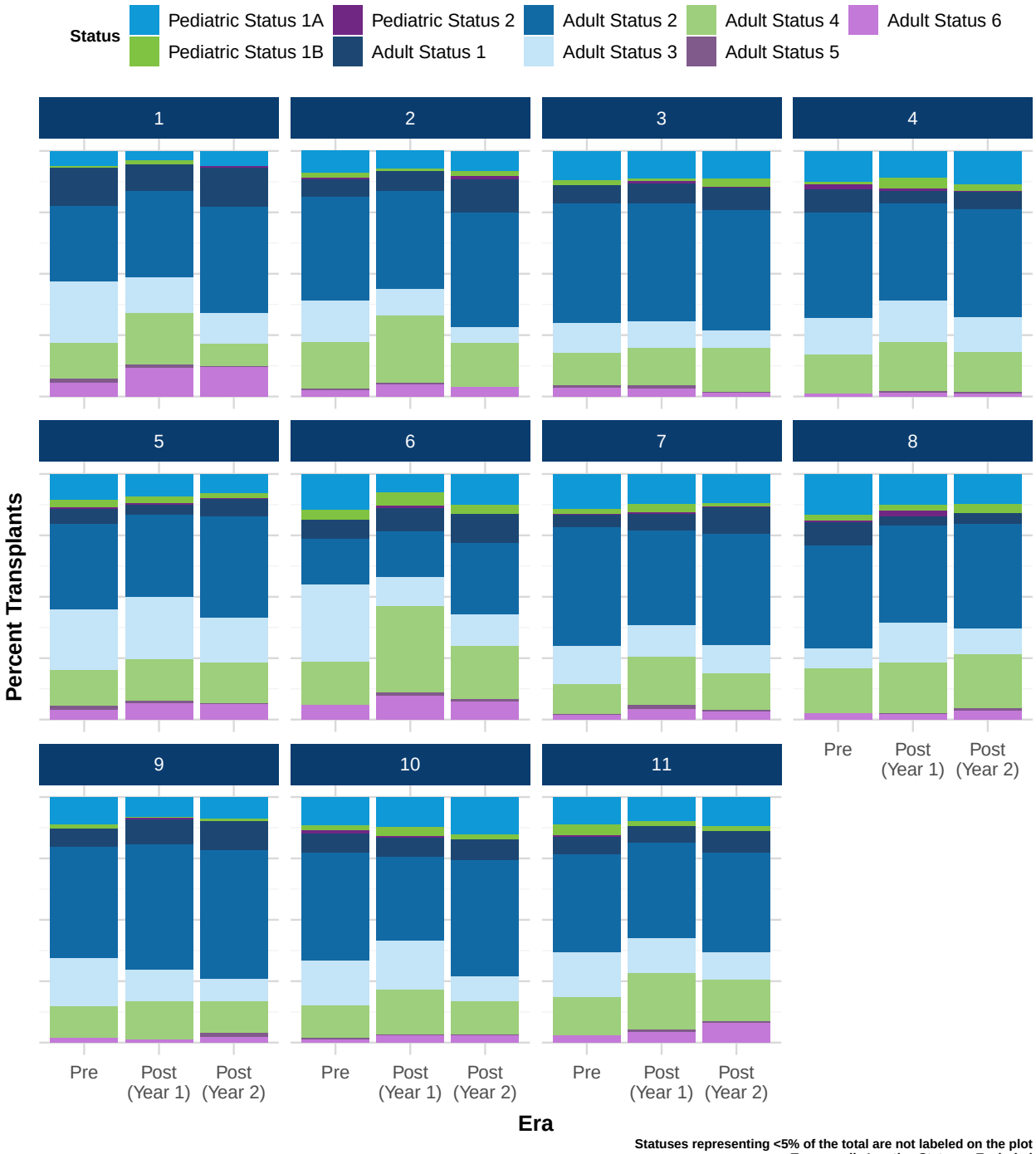


Figure A2b. Transplants by Region, Medical Urgency Status and Era (with post−policy era stratified by year)



Statuses representing <5% of the total are not labeled on the plot
Temporarily Inactive Statuses Excluded

Table A5: Heart Transplants by Region and Medical Urgency Status Pre-Implementation

Region		Pediatric Status 1A	Pediatric Status 1B	Pediatric Status 2	Adult Status 1	Adult Status 2	Adult Status 3	Adult Status 4	Adult Status 5	Adult Status 6	Total
1	N	12	1	0	30	60	48	28	3	11	151
	%	0.34%	0.03%	0.00%	0.85%	1.69%	1.35%	0.79%	0.08%	0.31%	4.25%
2	N	30	7	2	25	142	58	63	2	9	264
	%	0.85%	0.20%	0.06%	0.70%	4.00%	1.63%	1.77%	0.06%	0.25%	7.44%
3	N	47	7	0	30	190	48	52	3	14	322
	%	1.32%	0.20%	0.00%	0.85%	5.35%	1.35%	1.46%	0.08%	0.39%	9.07%
4	N	40	4	6	30	138	48	50	0	4	266
	%	1.13%	0.11%	0.17%	0.85%	3.89%	1.35%	1.41%	0.00%	0.11%	7.49%
5	N	62	17	4	35	203	143	86	8	23	464
	%	1.75%	0.48%	0.11%	0.99%	5.72%	4.03%	2.42%	0.23%	0.65%	13.07%
6	N	15	4	0	8	19	32	18	0	6	78
	%	0.42%	0.11%	0.00%	0.23%	0.54%	0.90%	0.51%	0.00%	0.17%	2.20%
7	N	49	8	1	18	168	54	42	2	6	298
	%	1.38%	0.23%	0.03%	0.51%	4.73%	1.52%	1.18%	0.06%	0.17%	8.39%
8	N	41	6	1	24	102	20	45	0	6	194
	%	1.15%	0.17%	0.03%	0.68%	2.87%	0.56%	1.27%	0.00%	0.17%	5.46%
9	N	28	5	0	19	114	50	32	0	5	216
	%	0.79%	0.14%	0.00%	0.54%	3.21%	1.41%	0.90%	0.00%	0.14%	6.08%
10	N	34	6	3	22	128	52	39	2	3	245
	%	0.96%	0.17%	0.08%	0.62%	3.61%	1.46%	1.10%	0.06%	0.08%	6.90%
11	N	55	22	2	36	195	90	75	1	14	400
	%	1.55%	0.62%	0.06%	1.01%	5.49%	2.54%	2.11%	0.03%	0.39%	11.27%

Table A6: Heart Transplants by Region and Medical Urgency Status Post-Implementation

Region		Pediatric Status 1A	Pediatric Status 1B	Pediatric Status 2	Adult Status 1	Adult Status 2	Adult Status 3	Adult Status 4	Adult Status 5	Adult Status 6	Total
1	N	18	3	1	48	141	48	54	4	42	259
	%	0.24%	0.04%	0.01%	0.64%	1.89%	0.64%	0.72%	0.05%	0.56%	3.46%
2	N	50	10	5	70	280	57	145	2	29	472
	%	0.67%	0.13%	0.07%	0.94%	3.75%	0.76%	1.94%	0.03%	0.39%	6.31%
3	N	94	19	6	71	406	77	138	7	20	673
	%	1.26%	0.25%	0.08%	0.95%	5.43%	1.03%	1.85%	0.09%	0.27%	9.00%
4	N	87	24	4	44	292	108	125	5	9	559
	%	1.16%	0.32%	0.05%	0.59%	3.91%	1.44%	1.67%	0.07%	0.12%	7.48%
5	N	108	31	5	71	475	277	212	9	81	967
	%	1.44%	0.41%	0.07%	0.95%	6.35%	3.71%	2.84%	0.12%	1.08%	12.94%
6	N	21	9	1	22	49	25	57	2	17	127
	%	0.28%	0.12%	0.01%	0.29%	0.66%	0.33%	0.76%	0.03%	0.23%	1.70%
7	N	84	16	3	63	293	84	120	7	26	543
	%	1.12%	0.21%	0.04%	0.84%	3.92%	1.12%	1.61%	0.09%	0.35%	7.26%
8	N	61	16	5	20	203	65	106	3	14	370
	%	0.82%	0.21%	0.07%	0.27%	2.72%	0.87%	1.42%	0.04%	0.19%	4.95%
9	N	48	4	1	63	288	62	78	5	10	466
	%	0.64%	0.05%	0.01%	0.84%	3.85%	0.83%	1.04%	0.07%	0.13%	6.23%
10	N	85	18	2	51	250	95	100	3	17	501
	%	1.14%	0.24%	0.03%	0.68%	3.34%	1.27%	1.34%	0.04%	0.23%	6.70%
11	N	119	23	0	84	434	138	218	9	66	798
	%	1.59%	0.31%	0.00%	1.12%	5.81%	1.85%	2.92%	0.12%	0.88%	10.68%

Table A7: Heart Transplants by Region and Medical Urgency Status Post-Implementation (Year 1)

Region		Pediatric Status 1A	Pediatric Status 1B	Pediatric Status 2	Adult Status 1	Adult Status 2	Adult Status 3	Adult Status 4	Adult Status 5	Adult Status 6	Total
1	N	7	3	0	20	64	26	38	3	21	120
	%	0.19%	0.08%	0.00%	0.54%	1.74%	0.71%	1.03%	0.08%	0.57%	3.26%
2	N	23	3	1	25	128	35	87	2	16	215
	%	0.63%	0.08%	0.03%	0.68%	3.48%	0.95%	2.37%	0.05%	0.44%	5.85%
3	N	48	5	5	34	207	47	66	5	14	346
	%	1.31%	0.14%	0.14%	0.92%	5.63%	1.28%	1.79%	0.14%	0.38%	9.41%
4	N	36	14	3	17	128	55	65	2	5	253
	%	0.98%	0.38%	0.08%	0.46%	3.48%	1.50%	1.77%	0.05%	0.14%	6.88%
5	N	59	17	4	26	211	162	107	6	42	479
	%	1.60%	0.46%	0.11%	0.71%	5.74%	4.40%	2.91%	0.16%	1.14%	13.02%
6	N	7	5	1	9	17	11	33	1	9	50
	%	0.19%	0.14%	0.03%	0.24%	0.46%	0.30%	0.90%	0.03%	0.24%	1.36%
7	N	40	11	2	22	127	41	65	5	14	243
	%	1.09%	0.30%	0.05%	0.60%	3.45%	1.11%	1.77%	0.14%	0.38%	6.61%
8	N	31	6	5	9	97	39	51	1	5	187
	%	0.84%	0.16%	0.14%	0.24%	2.64%	1.06%	1.39%	0.03%	0.14%	5.08%
9	N	21	1	1	26	128	33	39	0	3	210
	%	0.57%	0.03%	0.03%	0.71%	3.48%	0.90%	1.06%	0.00%	0.08%	5.71%
10	N	40	13	2	26	113	66	60	2	9	260
	%	1.09%	0.35%	0.05%	0.71%	3.07%	1.79%	1.63%	0.05%	0.24%	7.07%
11	N	54	11	0	35	210	77	124	5	23	387
	%	1.47%	0.30%	0.00%	0.95%	5.71%	2.09%	3.37%	0.14%	0.63%	10.52%

Table A8: Heart Transplants by Region and Medical Urgency Status Post-Implementation (Year 2)

Region		Pediatric Status 1A	Pediatric Status 1B	Pediatric Status 2	Adult Status 1	Adult Status 2	Adult Status 3	Adult Status 4	Adult Status 5	Adult Status 6	Total
1	N	11	0	1	28	77	22	16	1	21	139
	%	0.29%	0.00%	0.03%	0.74%	2.03%	0.58%	0.42%	0.03%	0.55%	3.66%
2	N	27	7	4	45	152	22	58	0	13	257
	%	0.71%	0.18%	0.11%	1.19%	4.00%	0.58%	1.53%	0.00%	0.34%	6.77%
3	N	46	14	1	37	199	30	72	2	6	327
	%	1.21%	0.37%	0.03%	0.97%	5.24%	0.79%	1.90%	0.05%	0.16%	8.61%
4	N	51	10	1	27	164	53	60	3	4	306
	%	1.34%	0.26%	0.03%	0.71%	4.32%	1.40%	1.58%	0.08%	0.11%	8.06%
5	N	49	14	1	45	264	115	105	3	39	488
	%	1.29%	0.37%	0.03%	1.19%	6.95%	3.03%	2.77%	0.08%	1.03%	12.85%
6	N	14	4	0	13	32	14	24	1	8	77
	%	0.37%	0.11%	0.00%	0.34%	0.84%	0.37%	0.63%	0.03%	0.21%	2.03%
7	N	44	5	1	41	166	43	55	2	12	300
	%	1.16%	0.13%	0.03%	1.08%	4.37%	1.13%	1.45%	0.05%	0.32%	7.90%
8	N	30	10	0	11	106	26	55	2	9	183
	%	0.79%	0.26%	0.00%	0.29%	2.79%	0.68%	1.45%	0.05%	0.24%	4.82%
9	N	27	3	0	37	160	29	39	5	7	256
	%	0.71%	0.08%	0.00%	0.97%	4.21%	0.76%	1.03%	0.13%	0.18%	6.74%
10	N	45	5	0	25	137	29	40	1	8	241
	%	1.19%	0.13%	0.00%	0.66%	3.61%	0.76%	1.05%	0.03%	0.21%	6.35%
11	N	65	12	0	49	224	61	94	4	43	411
	%	1.71%	0.32%	0.00%	1.29%	5.90%	1.61%	2.48%	0.11%	1.13%	10.82%