

OPTN Liver & Intestinal Transplantation Committee

Descriptive Data Request

# Two Year Monitoring Report of Liver and Intestine Acuity Circle Allocation Removal of DSA and Region as Units of Allocation

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## Purpose

The purpose of this report is to look at high-level metrics revealing the performance of the system and any potential consequences that may require changes to policy, programming, or clinical practice. This report, performed on behalf of the Organ Procurement and Transplantation Network (OPTN) Liver and Intestinal Transplantation Committee, will be the final post-implementation monitoring report. The OPTN will respond to further requests by the Committee as well as relay appropriate requests to the Scientific Registry of Transplant Recipients (SRTR) related to these changes.

## Monitoring Plan

Monitoring of the effect of policy changes implemented on February 04, 2020 will focus on changes in the match process, waiting list population, liver transplant recipient population, and deceased donor utilization. Specifically, analyses will provide comparisons pre- and post-policy implementation and include:

- Changes in the number of livers and intestines recovered and transplanted
- Impact on the national liver discard and utilization rates
- Changes in the median allocation Model for End-Stage Liver Disease (MELD) or Pediatric End-Stage Liver Disease (PELD) score at transplant
- Changes in the distance (in nautical miles, NM) from the donor hospital to the transplant center for deceased donor liver and intestine transplants
- Impact on the number of liver and intestine candidates removed from the waiting list by reported removal reason
- Changes in the sequence number of liver transplant recipient
- Changes in the time from an Organ Procurement Organization's (OPO) first electronic notification of an offer to cross clamp for deceased donor livers
- Waiting list drop out rates by exception status
- Changes in deceased donor liver transplant recipients by exception status, and associated allocation scores

## Data and Methods

### Data Sources:

These analyses use data from the OPTN waiting list, Potential Transplant Recipient (PTR) data, as well as the Transplant Candidate Registration (TCR), Transplant Recipient Registration (TRR), Transplant Recipient Followup (TRF), and Deceased Donor Registration (DDR) forms. Analyses are based on OPTN data as of June 17, 2022 and are subject to change based on any future data submission or correction.

### Cohorts:

The cohorts examined contain periods of 730 days, or two years of data before and after the liver policy change, for most metrics, excluding post-transplant survival.

In the *Liver Waiting List* section, new registrations added to the liver waiting list are used. The pre- and post-policy eras are defined as 02/03/2018 - 02/03/2020 and 02/04/2020 - 02/03/2022, respectively. For waitlist dropout and transplant rates in this section, cohorts are defined as liver-alone registrations ever waiting during the pre- and post-policy periods. Multi-organ listings are excluded from rates. Adult (age 18 or older at listing) and pediatric (age <18 at listing) sections are included. A cumulative incidence section is also included looking at cumulative incidence of transplant and waitlist deaths or removals for too sick.

The *Deceased Donor Liver Transplants* section includes cohorts of deceased donor, liver-alone transplant recipients as well as deceased donor, liver multi-organ transplant recipients, labeled accordingly. Deceased donor liver-alone transplants are further broken down into adult (age 18 or older at transplant) and pediatric (age <18 at transplant) sections, to elicit differences in patterns for these two groups. Cohorts of transplants are defined during 02/03/2018 - 02/03/2020 and 02/04/2020 - 02/03/2022 pre- and post-policy. Post-transplant patient survival is also included in this section, and contains cohorts of all-age deceased donor liver-alone transplant recipients from 02/03/2018 -

02/03/2019 and 02/04/2020 - 02/03/2021, pre- and post-policy, respectively, to allow for one year of follow-up time.

Data in the *Offer Rates* section includes offers for liver-alone registrations ever waiting during 02/03/2018 - 02/03/2020 (pre) and 02/04/2020 - 02/03/2022 (post), stratified by a number of candidate characteristics. Multi-organ listings are excluded from these rates.

A number of data sets are used to provide the metrics in the *Liver Utilization* section. Data on all deceased organ donors from which at least one organ was recovered for the purpose of transplantation was used for liver utilization rates, while the subset of these donors that had a liver recovered were used for liver discard rates as well as volume of deceased liver donors procured. The pre- and post-policy eras were defined as 02/03/2018 - 02/03/2020 and 02/04/2020 - 02/03/2022, respectively. Deceased donor liver match runs with a final acceptance during these pre- and post-policy eras are also used. Deceased donor, liver-alone transplants were used to evaluate donor-to-recipient age comparisons, defined by the periods also used in the *Deceased Donor Liver Transplants* section.

The *Intestine* section reviews new registrations added to the intestine waiting list, registrations removed from the intestine waiting list due to reasons of death or too sick to transplant, cumulative incidence of transplant and removal for death or too sick to transplant, deceased intestine donors recovered, and deceased donor intestine transplants. One year post-transplant patient survival is also included in this section. The time periods defined for each data set are the same as in the liver sections. This section includes both intestine-alone and intestine multi-organ transplants.

Additional information is provided in the *Appendix*, including characteristics of liver registrations, additional waitlist dropout and transplant rates, liver-alone registrations removed from the waitlist due to death or too sick, and additional deceased donor transplant information.

## A Note About COVID-19

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. Based on the WHO's declaration of the pandemic and the national state of emergency, the post-implementation monitoring for this report contains roughly 23 months of COVID-19 Era data. Given the impact that has been seen on the U.S. transplant and donation community ([unos.org/covid](https://unos.org/covid)) the true impact of this policy change is very challenging to determine.

## Methods

Counts and percentages are used to summarize categorical variables or characteristics, while density curves and distribution summaries (minimum, maximum, mean, median, percentiles) are provided for continuous characteristics. If statistical tests of comparison were performed, Chi-Square tests were used for categorical comparisons pre- vs. post-policy. Non-parametric Kruskal-Wallis and Mann-Whitney rank sum tests were used for comparisons in mean and median values pre- vs. post-policy, respectively, when the assumption of normality of the distribution may not hold. The Kolmogorov-Smirnov test was used to compare full distributions of continuous variables pre- vs. post-policy. The Fligner-Killeen test compared the variance in median MELD at transplant (MMaT) pre- vs. post-policy, as it is a robust non-parametric test against departures from normality.

For waiting list dropout (for reasons of death or too sick to transplant) rates, all liver-alone registrations ever on the waiting list were included, even if listed for less than one day or never active. For transplant rate and offer rate analysis, only liver-alone registrations on the waiting list for at least one day were included. These rate analyses are registration-based, not candidate-based. That is, a single candidate may have had a liver registration at multiple transplant centers. Each such registration was counted separately in the analysis and contributed to the appropriate eras and characteristic group. However, if a candidate had multiple registrations that, on the same day, were in the same characteristic group, this active person-day was only counted once in the transplant and offer rate denominator. While waiting time for each registration is contributed for each candidate, only one event per candidate is recorded. This is taken as the first occurrence.

Dropout rates expressed by removals per 100 person-years were calculated by dividing the number of removals for death or too sick to transplant by the number of years patients spent waiting. Dividing by the number of person-years serves to normalize the rates to account for often drastic differences in the number of candidates and durations of time waited (within each era) by different patient characteristics. For each time interval, all waiting time (active and inactive) within the interval was used to calculate person-years. Since some candidates may spend several months or years on the waiting list, a candidate may contribute waiting time to both eras, but a removal is attributed only to the era and characteristic group in which it occurred. Some candidates may also be multi-listed at a number of transplant programs and thus have multiple registrations. Waiting time for each registration is contributed for each candidate, but only one removal per candidate is included in the calculation.

Transplant rates as expressed by transplants per 100 active person-years were calculated by dividing the number of deceased donor liver-alone transplants by the number of active years patients spent waiting. For each time interval, only active waiting time within the interval analyzed was used for the person-years calculation since candidates may only receive offers and thus transplants when in an active status. Since some candidates may spend several months or years on the waiting list, a candidate may contribute waiting time to both eras, but a transplant is attributed only to the era and characteristic group in which it occurred.

Offer rates as expressed by offers per active person-year were calculated by dividing the number of offers received by the number of active years patients spent waiting.

For dropout and transplant rates by exception status group and era, the associated waiting time from a candidate registration was attributed to the person-years under "HCC exception" if there was ever an approved liver MELD or PELD exception request for HCC diagnosis (within that era). This does not include HCC diagnoses submitted under "Other specify". Similarly, associated waiting time for a candidate registration was attributed to the person-years under "Non-HCC exception" if an approved liver MELD or PELD exception request for a diagnosis other than HCC occurred within that era. If a registration had multiple forms submitted within an era for both HCC and non-HCC exception types, the first of these that was submitted was used. All other candidates' person-years waiting was attributed to the non-exception status group. This exception status definition differs from that used when counting waiting list removals or transplants, where such group membership is defined as the exception status at the time of event rather than ever during the policy period; thus, counts may not align with events from rates based on these definitions.

Cumulative incidence of transplant and cumulative incidence of waitlist removal for death or too sick to transplant were based on a Fine-Gray competing risks analysis. For the purpose of these analyses, days waiting is total days on the waitlist, regardless of active status. A candidate is considered transplanted if they were removed from the waitlist after receiving either a deceased or living donor liver transplant. A death on the waitlist is defined as removal from the waitlist as a result of death or becoming too sick to transplant. Data were censored if registrations were listed in the pre-policy era but removed in the post-policy era or if an event occurred after the end of the cohort period (02/03/2022).

Post-transplant patient survival was calculated for the subset of deceased donor, liver-alone transplant recipients with at least one year of follow-up. Survival curves and point estimates were constructed using unadjusted Kaplan-Meier methodology and compared using the log-rank test.

## Executive Summary

This report provides a review at two years under acuity circle (AC) allocation changes. Even with roughly 23 of the 24 months of the post-policy period during the COVID-19 pandemic, many of the results in this report continue to align with the intended outcomes of the policy change that were supported by the SRTR modeling predictions prior to the implementation of this proposal. Some of the main findings from this report include:

- Coinciding with the COVID-19 global pandemic, nationally, there were:
  - **461** more adult (age 18+ at listing) and **102** fewer pediatric (age <18 at listing) registrations added to the liver waiting list post-policy
  - **716** more adult (age 18+ at transplant) and **84** fewer pediatric (age <18 at transplant) deceased donor, liver-alone transplant recipients post-policy
  - **207** fewer adult (age 18+ at listing) and **18** fewer pediatric (age <18 at listing) registrations removed for death or too sick post-policy
  - **124** more simultaneous liver-kidney transplant recipients post-policy
  - **1005** more adult (age 18+ at donation) and **69** fewer pediatric (age <18 at donation) deceased liver donors recovered post-policy
- Transplant rates significantly increased for liver-alone candidates with MELD or PELD scores of 15 and lower and 29 and higher as well as for Status 1A/1B candidates
- The national median transplant score (MTS) for adults remained unchanged at 28, and decreased from 35 to 30 for pediatric transplant recipients
- The variance in MTS decreased post-policy by OPTN region, DSA, and state, although changes were not statistically significant
- Distances between donor hospital and transplant program increased for deceased donor, liver-alone recipients
  - Increased distances occurred most often for adult recipients with MELD scores 29 and higher or Status 1A
  - The proportion of national shares increased from 18% to 60% for pediatric recipients
  - Median cold ischemia time increased by 10 minutes for adult and 27 minutes for pediatric recipients
- Unadjusted post-transplant patient survival decreased from 93.5% pre-policy to 93.1% post-policy, and changes were not statistically significant
- Offer rates increased for all MELD or PELD score or status groups post-policy
- The liver discard rate increased slightly and the liver utilization rate decreased pre- to post-policy
- Nationally, there were:
  - **43** more intestine registrations added to the intestine waiting list post-policy
  - No change in the number of deceased donor intestine transplants post-policy
  - **1** more intestine registration removed for death or too sick post-policy
  - **10** fewer deceased intestine donors recovered post-policy

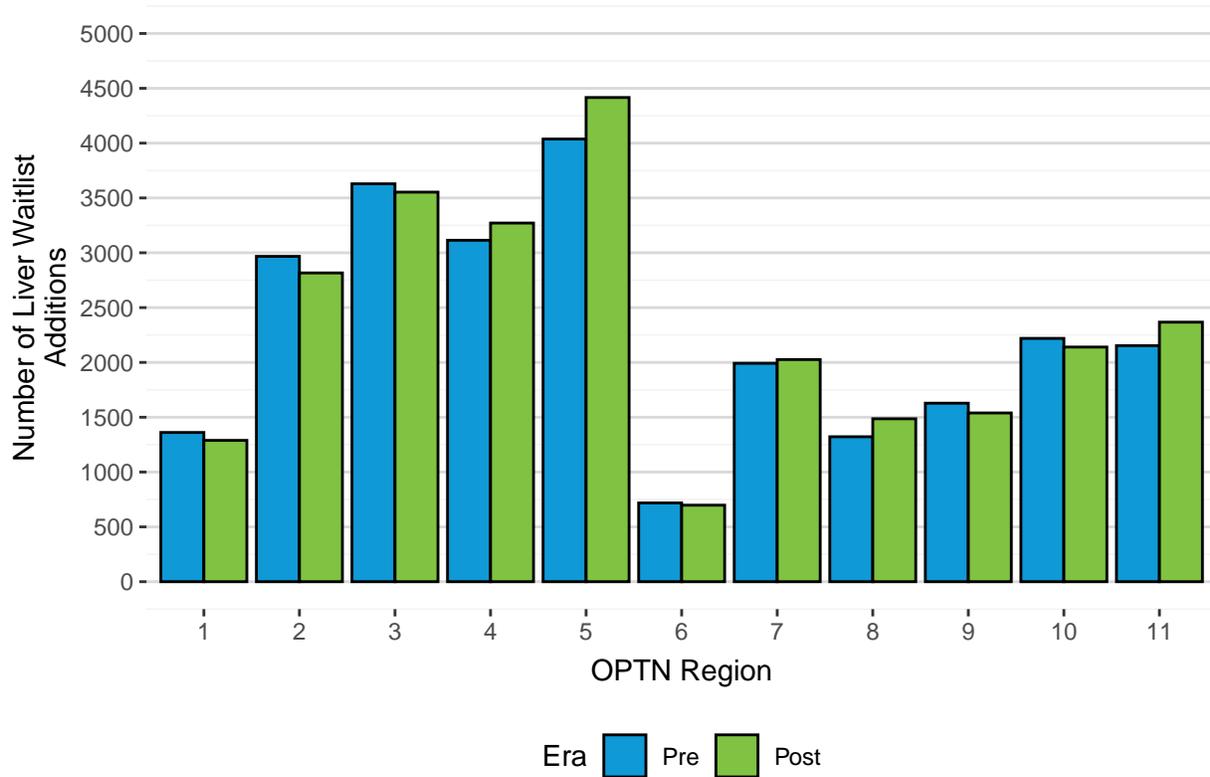
## Results

### Section I. Liver Waitlist

#### Adult Registration Additions

A registration was considered adult if the candidate was 18 years or older at listing. There were slightly more new adult liver waitlist registrations post-policy compared to pre-policy (percent change 1.8%). The proportions of waitlist additions among regions were fairly consistent.

**Figure 1. Adult Registrations Added to Liver Waitlist by OPTN Region of Listing Center and Era**



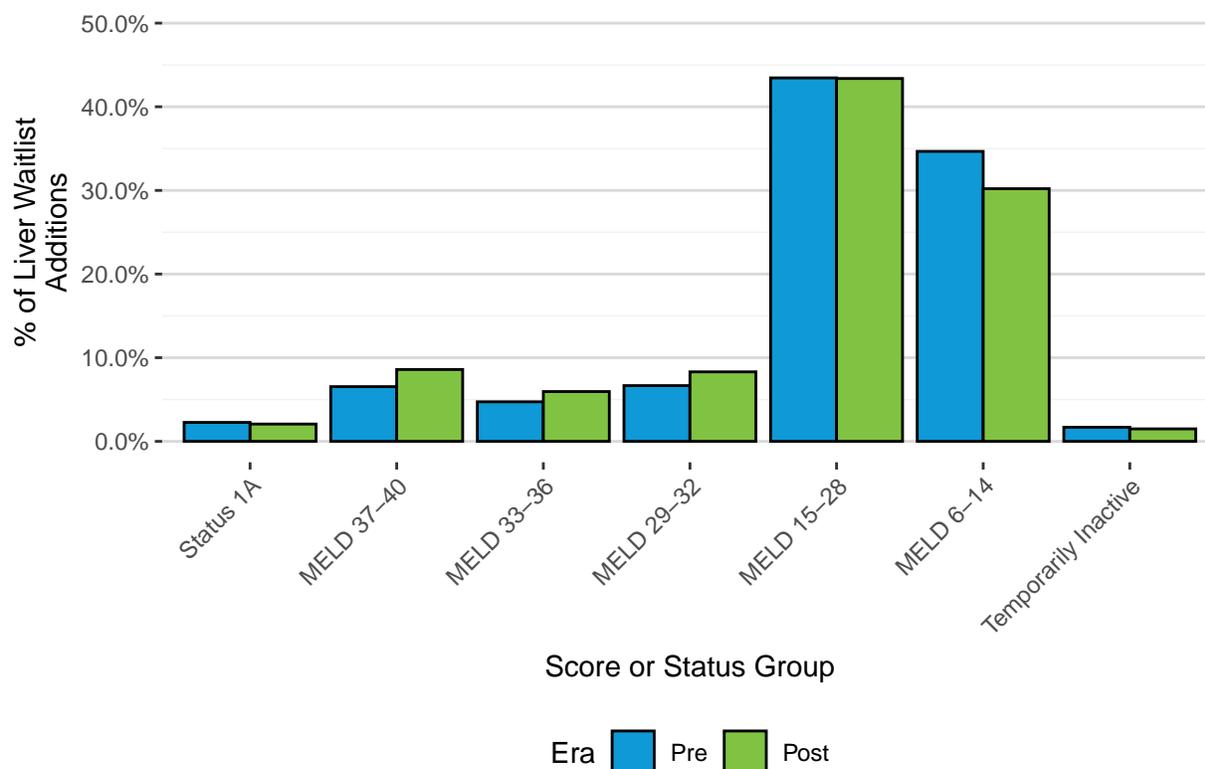
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 1. Number and Percent of Adult Registrations Added to Liver Waitlist by OPTN Region of Listing Center and Era**

OPTN Region	Pre-Policy	Post-Policy
1	1361 (5.4%)	1289 (5.0%)
2	2967 (11.8%)	2816 (11.0%)
3	3629 (14.4%)	3553 (13.9%)
4	3114 (12.4%)	3271 (12.8%)
5	4037 (16.1%)	4416 (17.2%)
6	718 (2.9%)	698 (2.7%)
7	1992 (7.9%)	2026 (7.9%)
8	1322 (5.3%)	1486 (5.8%)
9	1628 (6.5%)	1539 (6.0%)
10	2219 (8.8%)	2140 (8.4%)
11	2153 (8.6%)	2367 (9.2%)
Total	25140 (100.0%)	25601 (100.0%)

Post-policy there was a slightly larger proportion of adult registrations added to the waitlist with higher MELD scores (MELD 37-40, MELD 33-36, MELD 29-32) and a slightly smaller proportion of MELD 6-14 registrations added.

**Figure 2. Adult Registrations Added to Liver Waitlist by MELD Score or Status at Listing and Era**



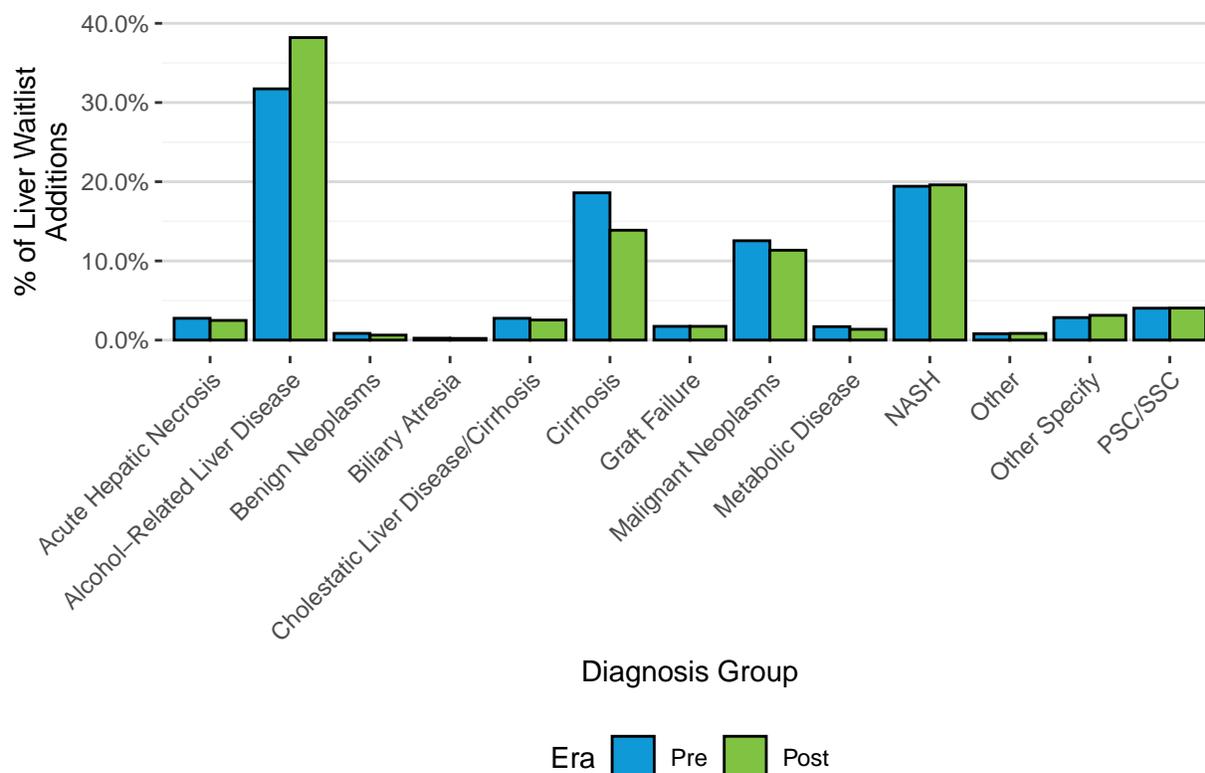
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 2. Number and Percent of Adult Registrations Added to Liver Waitlist by MELD Score or Status at Listing and Era**

Score or Status Group	Pre-Policy	Post-Policy
Status 1A	569 (2.3%)	530 (2.1%)
MELD 37-40	1644 (6.5%)	2199 (8.6%)
MELD 33-36	1189 (4.7%)	1524 (6.0%)
MELD 29-32	1675 (6.7%)	2127 (8.3%)
MELD 15-28	10924 (43.5%)	11106 (43.4%)
MELD 6-14	8715 (34.7%)	7733 (30.2%)
Temporarily Inactive	424 (1.7%)	382 (1.5%)
Total	25140 (100.0%)	25601 (100.0%)

Proportions of waitlist additions by diagnosis groups remained consistent pre- and post-policy with a notable increase (percent change 22.6%) in the number of waitlist additions with an alcohol-related liver disease post-policy and a decrease (percent change -24.0%) in the number of waitlist additions with cirrhosis post-policy.

**Figure 3. Adult Registrations Added to Liver Waitlist by Diagnosis Group and Era**



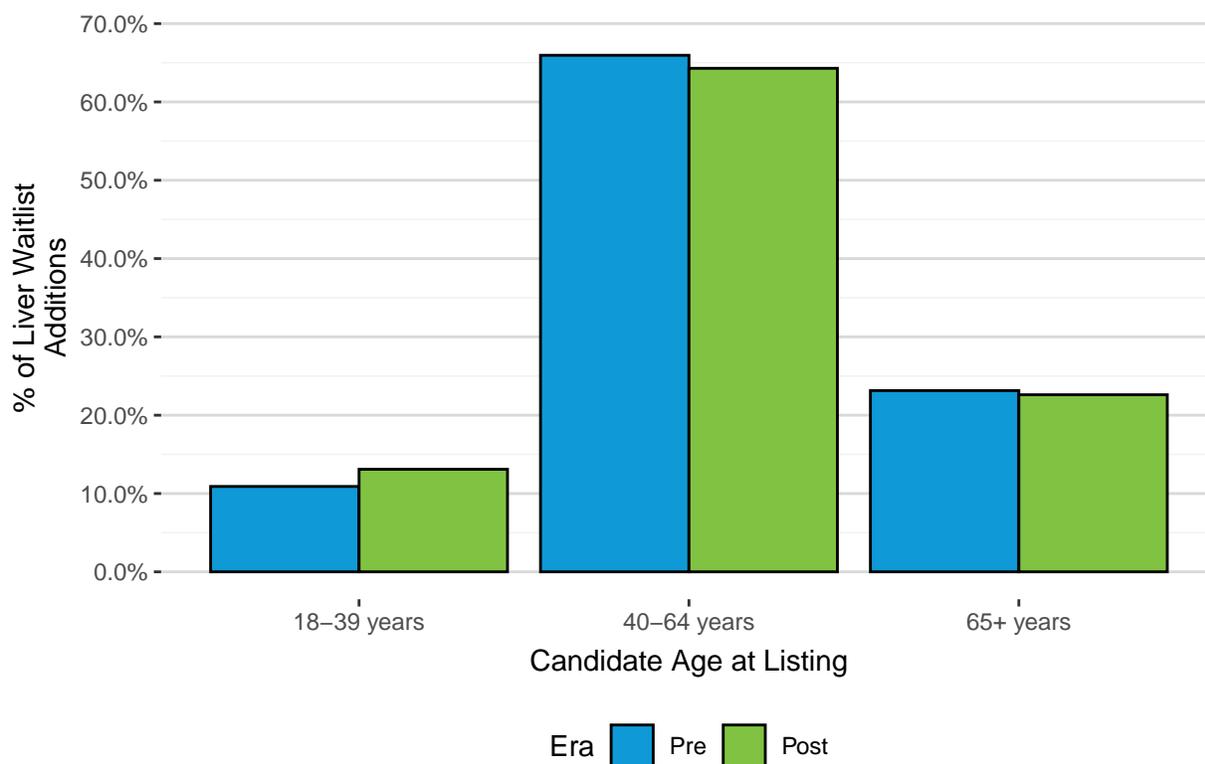
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 3. Number and Percent of Adult Registrations Added to Liver Waitlist by Diagnosis Group and Era**

Diagnosis Group	Pre-Policy	Post-Policy
Acute Hepatic Necrosis	693 (2.8%)	636 (2.5%)
Alcohol-Related Liver Disease	7977 (31.7%)	9781 (38.2%)
Benign Neoplasms	213 (0.8%)	161 (0.6%)
Biliary Atresia	60 (0.2%)	53 (0.2%)
Cholestatic Liver Disease/Cirrhosis	692 (2.8%)	649 (2.5%)
Cirrhosis	4676 (18.6%)	3552 (13.9%)
Graft Failure	436 (1.7%)	444 (1.7%)
Malignant Neoplasms	3154 (12.5%)	2906 (11.4%)
Metabolic Disease	427 (1.7%)	349 (1.4%)
NASH	4883 (19.4%)	5017 (19.6%)
Other	201 (0.8%)	216 (0.8%)
Other Specify	715 (2.8%)	801 (3.1%)
PSC/SSC	1013 (4.0%)	1036 (4.0%)
Total	25140 (100.0%)	25601 (100.0%)

Post-policy, there was a higher proportion of adult candidates added to the waitlist in the 18-39 years age category (13.1% post-policy vs. 10.9% pre-policy).

**Figure 4. Adult Registrations Added to Liver Waitlist by Candidate Age at Listing and Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

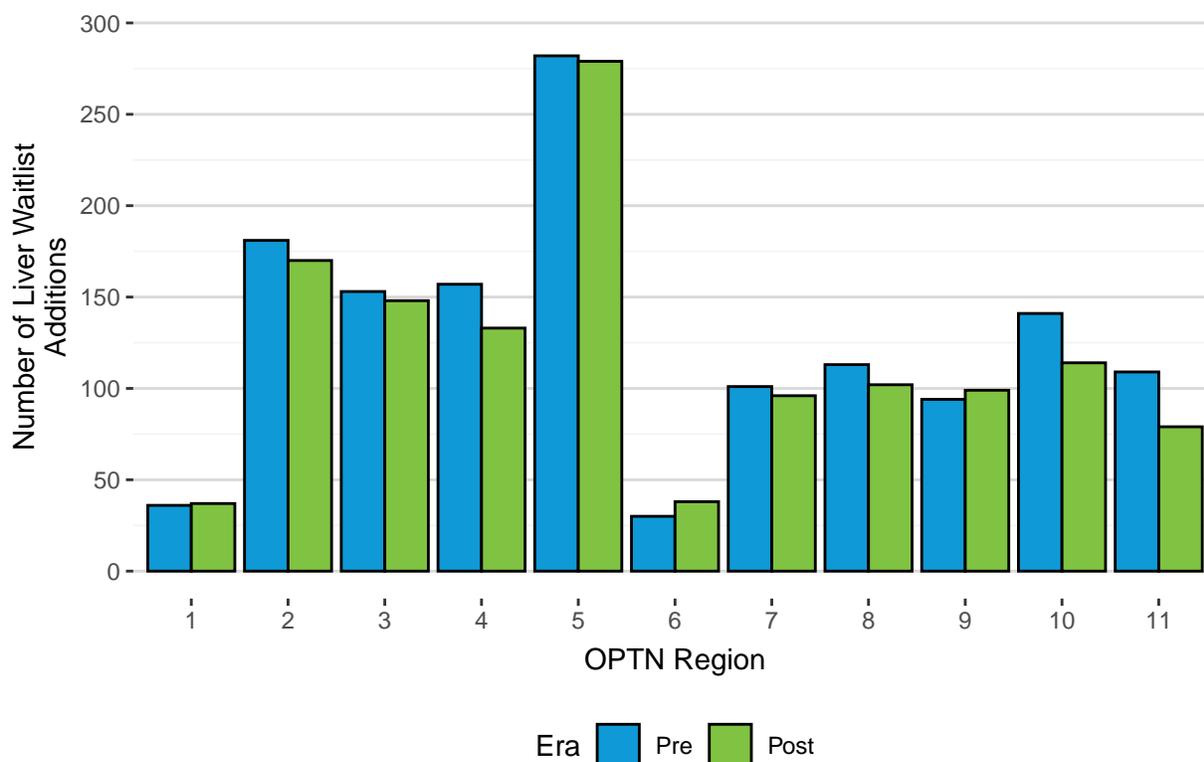
**Table 4. Number and Percent of Adult Registrations Added to Liver Waitlist by Candidate Age at Listing and Era**

Candidate Age at Listing	Pre-Policy	Post-Policy
18-39 years	2741 (10.9%)	3353 (13.1%)
40-64 years	16581 (66.0%)	16460 (64.3%)
65+ years	5818 (23.1%)	5788 (22.6%)
Total	25140 (100.0%)	25601 (100.0%)

### Pediatric Registration Additions

A registration was considered pediatric if the candidate was less than 18 years old at listing. There were fewer pediatric registrations added to the waitlist (percent change -7.3%) post-policy compared to pre-policy.

**Figure 5. Pediatric Registrations Added to Liver Waitlist by OPTN Region of Listing Center and Era**



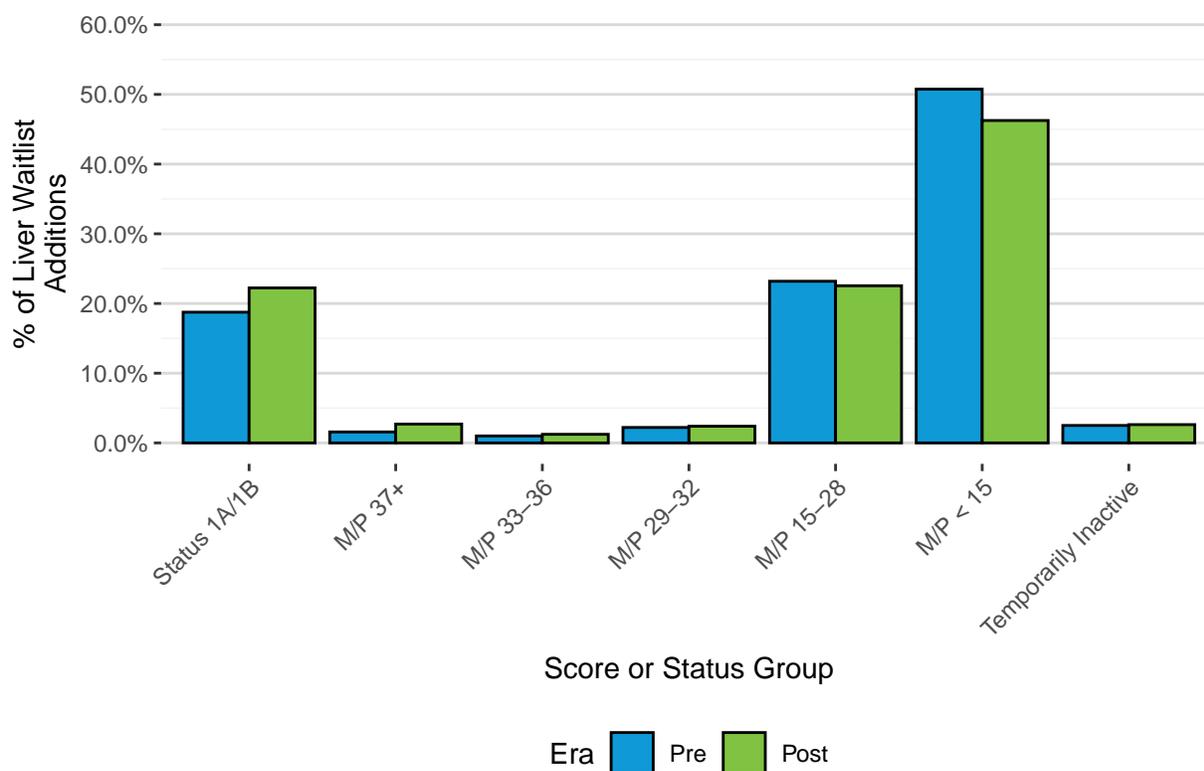
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 5. Number and Percent of Pediatric Registrations Added to Liver Waitlist by OPTN Region of Listing Center and Era**

OPTN Region	Pre-Policy	Post-Policy
1	36 (2.6%)	37 (2.9%)
2	181 (13.0%)	170 (13.1%)
3	153 (11.0%)	148 (11.4%)
4	157 (11.2%)	133 (10.3%)
5	282 (20.2%)	279 (21.5%)
6	30 (2.1%)	38 (2.9%)
7	101 (7.2%)	96 (7.4%)
8	113 (8.1%)	102 (7.9%)
9	94 (6.7%)	99 (7.6%)
10	141 (10.1%)	114 (8.8%)
11	109 (7.8%)	79 (6.1%)
Total	1397 (100.0%)	1295 (100.0%)

Proportions of pediatric waitlist additions remained fairly consistent pre- and post-policy with a slightly higher proportion of Status 1A/1B registrations added to the waitlist post-policy and a slightly lower proportion of MELD or PELD <15 registrations added to the waitlist post-policy.

**Figure 6. Pediatric Registrations Added to Liver Waitlist by MELD or PELD Score or Status at Listing and Era**



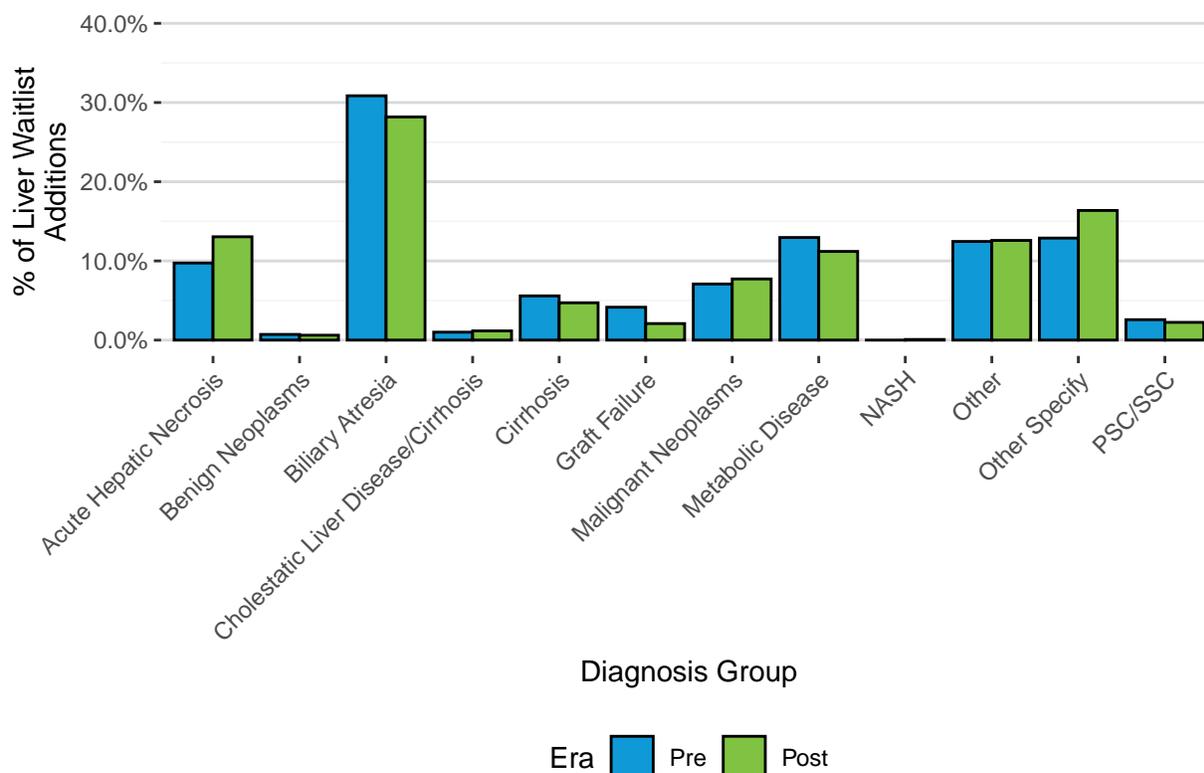
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 6. Number and Percent of Pediatric Registrations Added to Liver Waitlist by MELD or PELD Score or Status at Listing and Era**

Score or Status Group	Pre-Policy	Post-Policy
Status 1A/1B	262 (18.8%)	288 (22.2%)
M/P 37+	22 (1.6%)	35 (2.7%)
M/P 33-36	14 (1.0%)	16 (1.2%)
M/P 29-32	31 (2.2%)	31 (2.4%)
M/P 15-28	324 (23.2%)	292 (22.5%)
M/P < 15	709 (50.8%)	599 (46.3%)
Temporarily Inactive	35 (2.5%)	34 (2.6%)
Total	1397 (100.0%)	1295 (100.0%)

Overall, the distribution of pediatric waitlist additions by diagnosis group was similar pre- and post-policy. Post-policy there was an increase in the proportion of registrations added with a diagnosis of acute hepatic necrosis and a decrease in the proportion of registrations added with a diagnosis of biliary atresia and metabolic disease.

**Figure 7. Pediatric Registrations Added to Liver Waitlist by Diagnosis Group and Era**



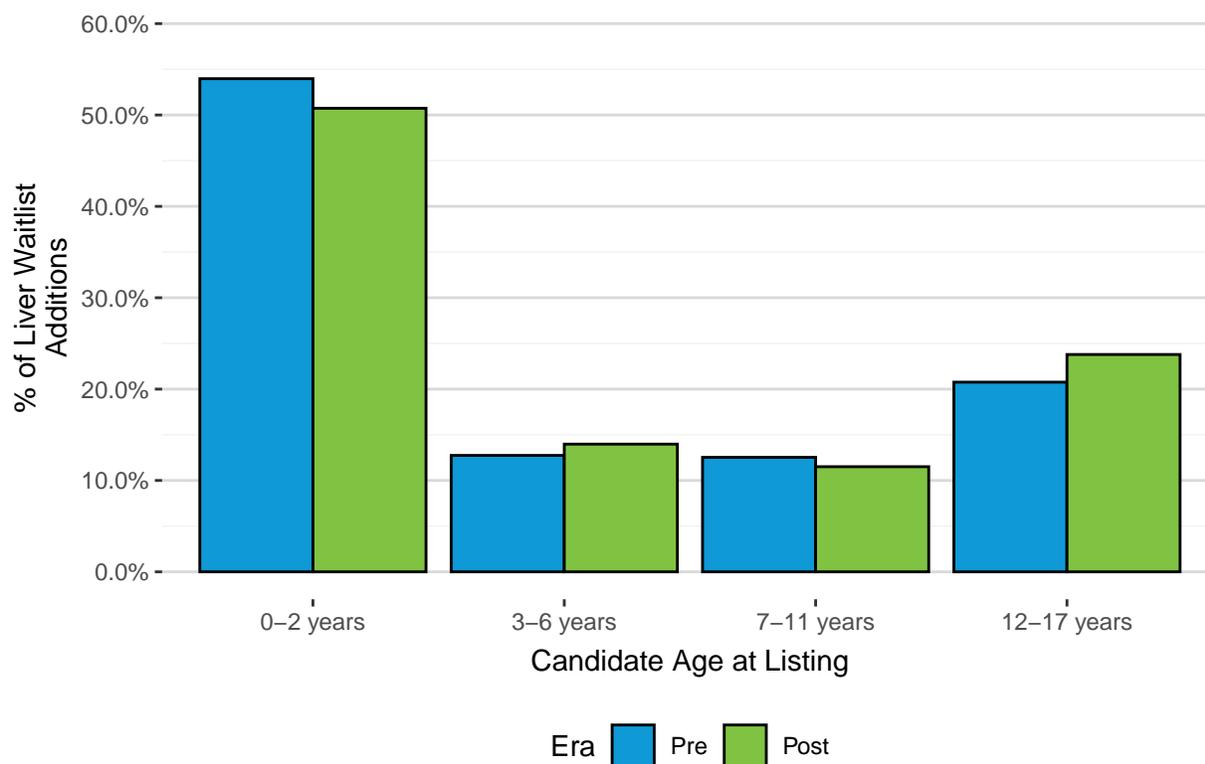
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 7. Number and Percent of Pediatric Registrations Added to Liver Waitlist by Diagnosis Group and Era**

Diagnosis Group	Pre-Policy	Post-Policy
Acute Hepatic Necrosis	136 (9.7%)	169 (13.1%)
Benign Neoplasms	10 (0.7%)	8 (0.6%)
Biliary Atresia	431 (30.9%)	365 (28.2%)
Cholestatic Liver Disease/Cirrhosis	14 (1.0%)	15 (1.2%)
Cirrhosis	78 (5.6%)	61 (4.7%)
Graft Failure	58 (4.2%)	27 (2.1%)
Malignant Neoplasms	99 (7.1%)	100 (7.7%)
Metabolic Disease	181 (13.0%)	145 (11.2%)
NASH	0 (0.0%)	1 (0.1%)
Other	174 (12.5%)	163 (12.6%)
Other Specify	180 (12.9%)	212 (16.4%)
PSC/SSC	36 (2.6%)	29 (2.2%)
Total	1397 (100.0%)	1295 (100.0%)

Post-policy, there were fewer candidates 0-2 years old at listing and more candidates 12-17 years old at listing added to the waitlist.

**Figure 8. Pediatric Registrations Added to Liver Waitlist by Candidate Age at Listing and Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 8. Number and Percent of Pediatric Registrations Added to Liver Waitlist by Candidate Age at Listing and Era**

Candidate Age at Listing	Pre-Policy	Post-Policy
0-2 years	754 (54.0%)	657 (50.7%)
3-6 years	178 (12.7%)	181 (14.0%)
7-11 years	175 (12.5%)	149 (11.5%)
12-17 years	290 (20.8%)	308 (23.8%)
Total	1397 (100.0%)	1295 (100.0%)

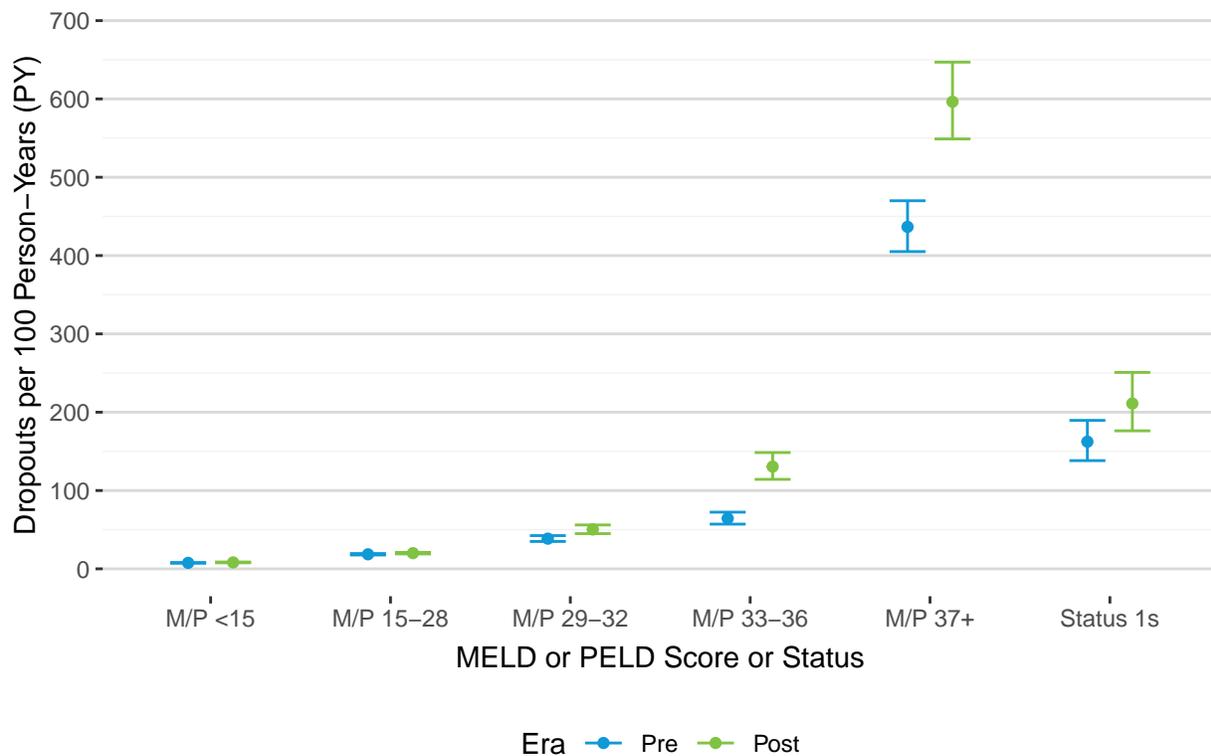
**Waitlist Removal Rates**

The following section looks at waitlist removal rates by MELD or PELD score or status and various stratifications. Additional waitlist removal rates by candidate ABO, candidate race/ethnicity, and candidate sex are in the **Appendix**.

Changes in the amount of waiting time and number of events for each score group determine changes in rates. In most cases of significant findings, there were fewer person-years, resulting in significantly different rates. Wide confidence intervals indicate small sample sizes.

Rates of removal for death or too sick to transplant significantly increased post-policy for the MELD/PELD 29-32, MELD/PELD 33-36, and MELD/PELD 37+ groups as indicated by non-overlapping confidence intervals and risk ratio confidence intervals >1, but did not significantly change for all other status groups. In all three significant groups, the number of events for death or removal for too sick were lower during the post-policy period, but there were fewer person-years, causing the rates to increase.

**Figure 9. Liver-Along Waitlist Rates of Removal Due to Death or Too Sick Per 100 Person-Years Waiting by MELD or PELD Score or Status and Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 9. Liver-Along Waitlist Rates of Removal Due to Death or Too Sick Per 100 Person-Years Waiting by MELD or PELD Score or Status and Era**

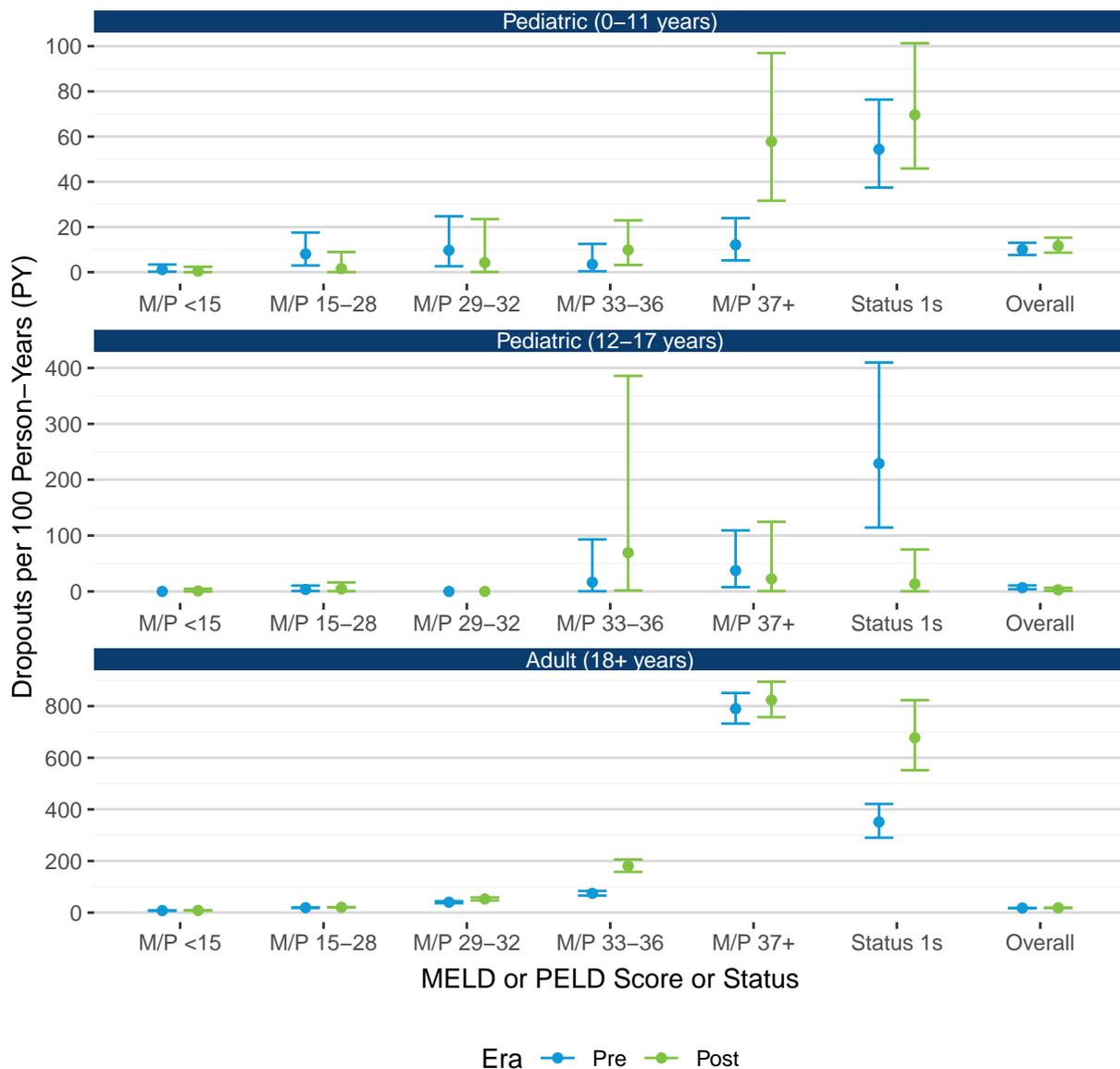
Score or Status Group	Era	Ever Waiting	Death/ Too Sick Events	Person- Years	Dropouts per 100 PY		Risk Ratio (vs. Pre-Policy)	
		N	N	PY	Estimate	95% CI	Estimate	95% CI
M/P <15	Pre	21323	1046	13709.9	7.63	7.17, 8.11	Ref.	Ref.
	Post	19255	1016	12350.4	8.23	7.73, 8.75	1.08	0.99, 1.18
M/P 15-28	Pre	20708	1517	8157.9	18.60	17.67, 19.56	Ref.	Ref.
	Post	19679	1594	7953.6	20.04	19.07, 21.05	1.08	1.00, 1.16
M/P 29-32	Pre	7262	417	1081.6	38.55	34.94, 42.44	Ref.	Ref.
	Post	5814	327	650.4	50.28	44.98, 56.03	1.30	1.13, 1.51
M/P 33-36	Pre	3928	283	439.5	64.40	57.11, 72.35	Ref.	Ref.
	Post	3420	231	177.0	130.53	114.24, 148.49	2.03	1.70, 2.41
M/P 37+	Pre	3520	708	162.2	436.63	405.06, 470.01	Ref.	Ref.
	Post	3446	581	97.4	596.43	548.91, 646.96	1.37	1.22, 1.52
Status 1s	Pre	1181	160	98.5	162.37	138.19, 189.57	Ref.	Ref.
	Post	1049	129	61.1	211.10	176.24, 250.83	1.30	1.03, 1.64

For pediatric candidates ages 0-11 years at listing, waitlist rates of removal due to death or too sick to transplant increased significantly in the PELD 37 and higher group post-policy. There were no other statistically significant differences in this age group.

For pediatric candidates ages 12-17 at listing, there was a statistically significant decrease in waitlist rates of removal due to death or too sick to transplant in the Status 1 group. There were no other statistically significant changes in this group, although there was a notable decrease in the number of death or too sick events post-policy (6 post-policy vs. 18 pre-policy).

In the adult age group, waitlist rates of removal due to death or too sick to transplant increased significantly in the MELD 29-32, MELD 33-36, and Status 1 groups post-policy. In all groups, the number of events for death or too sick and number of person-years decreased post-policy. There were no other statistically significant differences in this age group.

**Figure 10. Liver-Along Waitlist Rates of Removal Due to Death or Too Sick Per 100 Person-Years Waiting by MELD or PELD Score or Status, Age at Listing, and Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 10. Liver-Along Waitlist Rates of Removal Due to Death or Too Sick Per 100 Person-Years Waiting by MELD or PELD Score or Status, Age at Listing, and Era**

Age at Listing	Score or Status Group	Era	Ever Waiting	Death/ Too Sick Events	Person-Years	Dropouts per 100 PY	
			N	N	PY	Estimate	95% CI
Pediatric (0-11 years)	M/P <15	Pre	664	3	258.5	1.16	0.24, 3.39
		Post	519	1	231.4	0.43	0.01, 2.41
	M/P 15-28	Pre	412	6	74.4	8.06	2.96, 17.55
		Post	323	1	62.4	1.60	0.04, 8.93
	M/P 29-32	Pre	298	4	41.4	9.66	2.63, 24.73
		Post	166	1	23.7	4.21	0.11, 23.47
	M/P 33-36	Pre	319	2	57.7	3.47	0.42, 12.52
		Post	329	5	50.9	9.83	3.19, 22.93
	M/P 37+	Pre	311	8	65.9	12.14	5.24, 23.92
		Post	152	14	24.2	57.79	31.60, 96.97
	Status 1s	Pre	430	33	60.7	54.37	37.43, 76.36
		Post	351	27	38.8	69.62	45.88, 101.30
	Overall	Pre	1240	57	567.4	10.05	7.61, 13.02
		Post	1076	51	439.4	11.61	8.64, 15.26
Pediatric (12-17 years)	M/P <15	Pre	188	0	136.1	0.00	-, -
		Post	187	1	118.3	0.85	0.02, 4.71
	M/P 15-28	Pre	193	3	84.0	3.57	0.74, 10.44
		Post	159	2	45.0	4.45	0.54, 16.07
	M/P 29-32	Pre	78	0	12.6	0.00	-, -
		Post	55	0	7.2	0.00	-, -
	M/P 33-36	Pre	47	1	6.0	16.70	0.42, 93.07
		Post	20	1	1.4	69.26	1.75, 385.89
	M/P 37+	Pre	40	3	8.0	37.38	7.71, 109.25
		Post	16	1	4.5	22.37	0.57, 124.61
	Status 1s	Pre	73	11	4.8	229.04	114.33, 409.81
		Post	91	1	7.4	13.48	0.34, 75.10
	Overall	Pre	374	18	265.9	6.77	4.01, 10.70
		Post	388	6	203.0	2.96	1.08, 6.43
Adult	M/P <15	Pre	20475	1043	13315.4	7.83	7.36, 8.32
		Post	18555	1014	12001.8	8.45	7.94, 8.99
	M/P 15-28	Pre	20108	1508	8000.0	18.85	17.91, 19.83
		Post	19199	1591	7846.7	20.28	19.29, 21.30

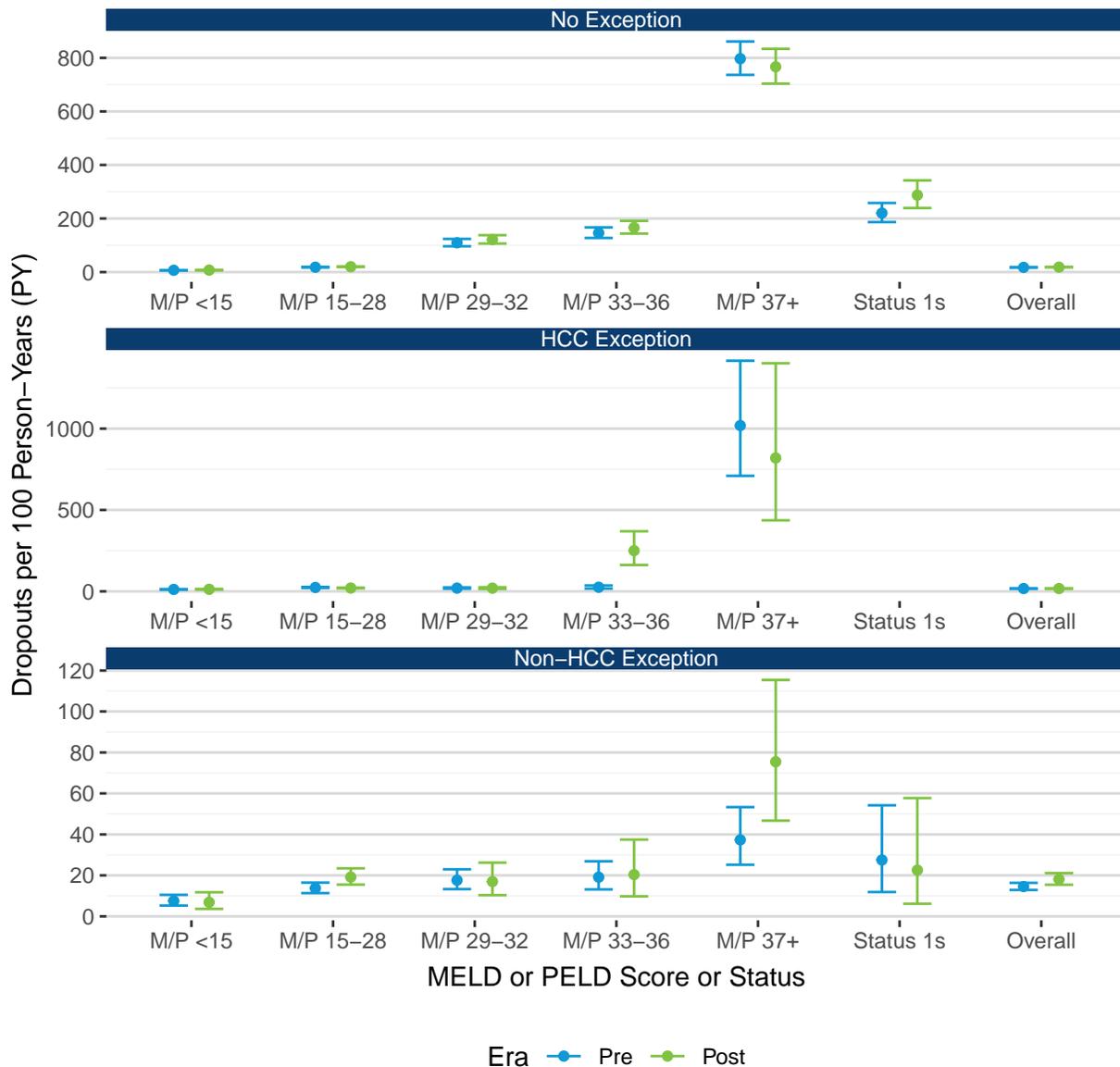
*(continued)*

Age at Listing	Score or Status Group	Era	N	N	PY	Estimate	95% CI
Adult (18+ years)	M/P 29-32	Pre	6887	413	1027.8	40.18	36.40, 44.25
		Post	5593	326	619.4	52.63	47.07, 58.66
	M/P 33-36	Pre	3563	280	375.8	74.52	66.04, 83.77
		Post	3071	225	124.6	180.51	157.69, 205.70
	M/P 37+	Pre	3169	697	88.2	789.95	732.39, 850.84
		Post	3278	566	68.7	823.66	757.19, 894.40
	Status 1s	Pre	678	116	33.0	351.02	290.05, 421.01
		Post	607	101	14.9	677.42	551.77, 823.12
	Overall	Pre	32777	4082	23094.3	17.68	17.14, 18.23
		Post	32402	3859	20930.5	18.44	17.86, 19.03

In this section, candidates were placed in the HCC exception group if they ever had an approved liver MELD or PELD exception request for an HCC diagnosis within that policy era. Similarly, candidates were placed in the non-HCC exception group if they ever had an approved liver MELD or PELD exception request for a diagnosis other than HCC in that era. All other candidates were placed in the no exception group.

It is important to note that the National Liver Review Board (NLRB) was implemented on May 14, 2019, so there is a subset of time in the pre-policy period when NLRB was in place prior to acuity-circles (05/14/2019 to 02/03/2020). Non-exception candidates did not experience significant changes in waitlist drop out rates across policy eras. This was also true for non-HCC candidates and most HCC exception candidates. However, HCC exception candidates in the MELD/PELD 33-36 group saw a statistically significant increase in waitlist drop out rates post-policy compared to pre-policy, likely due to the much smaller number of candidates in this group post-policy.

**Figure 11. Liver-Along Waitlist Rates of Removal Due to Death or Too Sick Per 100 Person-Years Waiting by MELD or PELD Score or Status, Exception Status, and Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 11. Liver-Along Waitlist Rates of Removal Due to Death or Too Sick Per 100 Person-Years Waiting by MELD or PELD Score or Status, Exception Status, and Era**

Exception Status	Score or Status Group	Era	Ever Waiting	Death/ Too Sick Events	Person- Years	Dropouts per 100 PY		
			N	N	PY	Estimate	95% CI	
No Exception	M/P <15	Pre	14216	718	10782.6	6.66	6.18, 7.16	
		Post	13617	730	9991.8	7.31	6.79, 7.86	
	M/P 15-28	Pre	14421	1114	6122.4	18.20	17.14, 19.30	
		Post	14560	1132	5677.8	19.94	18.79, 21.13	
	M/P 29-32	Pre	4189	253	231.2	109.45	96.38, 123.80	
		Post	4492	241	198.5	121.42	106.57, 137.76	
	M/P 33-36	Pre	2876	220	150.6	146.10	127.43, 166.74	
		Post	2942	196	117.9	166.23	143.77, 191.21	
	M/P 37+	Pre	2999	643	80.7	797.01	736.59, 861.06	
		Post	3180	547	71.3	766.75	703.84, 833.79	
	Status 1s	Pre	1014	153	69.5	220.25	186.74, 258.05	
		Post	956	125	43.5	287.31	239.16, 342.32	
	Overall	Pre	25612	3128	17703.4	17.67	17.06, 18.30	
		Post	26827	3009	16369.1	18.38	17.73, 19.05	
HCC Exception	M/P <15	Pre	5346	293	2470.9	11.86	10.54, 13.30	
		Post	4809	275	2177.8	12.63	11.18, 14.21	
	M/P 15-28	Pre	4231	286	1202.4	23.79	21.11, 26.71	
		Post	4022	369	1797.2	20.53	18.49, 22.74	
	M/P 29-32	Pre	1918	109	544.6	20.02	16.44, 24.15	
		Post	943	66	334.6	19.72	15.25, 25.09	
	M/P 33-36	Pre	390	30	118.7	25.28	17.05, 36.08	
		Post	127	25	10.0	249.93	161.74, 368.95	
	M/P 37+	Pre	92	35	3.4	1018.74	709.59, 1416.82	
		Post	63	13	1.6	819.52	436.36, 1401.40	
	Overall	Pre	6188	753	4349.0	17.31	16.10, 18.60	
		Post	5698	748	4332.6	17.26	16.05, 18.55	
		M/P <15	Pre	1896	35	463.7	7.55	5.26, 10.50
			Post	918	13	189.2	6.87	3.66, 11.75
M/P 15-28		Pre	2217	117	852.3	13.73	11.35, 16.45	
		Post	1216	94	490.8	19.15	15.48, 23.44	
M/P 29-32		Pre	1204	55	311.8	17.64	13.29, 22.96	
		Post	389	20	117.8	16.98	10.37, 26.22	

*(continued)*

Exception Status	Score or Status Group	Era	N	N	PY	Estimate	95% CI
Non-HCC Exception	M/P 33-36	Pre	679	33	172.6	19.12	13.16, 26.85
		Post	357	10	49.1	20.37	9.77, 37.46
	M/P 37+	Pre	449	30	80.4	37.34	25.19, 53.30
		Post	217	21	27.8	75.48	46.72, 115.38
	Status 1s	Pre	181	8	29.1	27.50	11.87, 54.19
		Post	100	4	17.7	22.54	6.14, 57.72
	Overall	Pre	3027	278	1912.8	14.53	12.87, 16.35
		Post	1650	162	895.2	18.10	15.42, 21.11

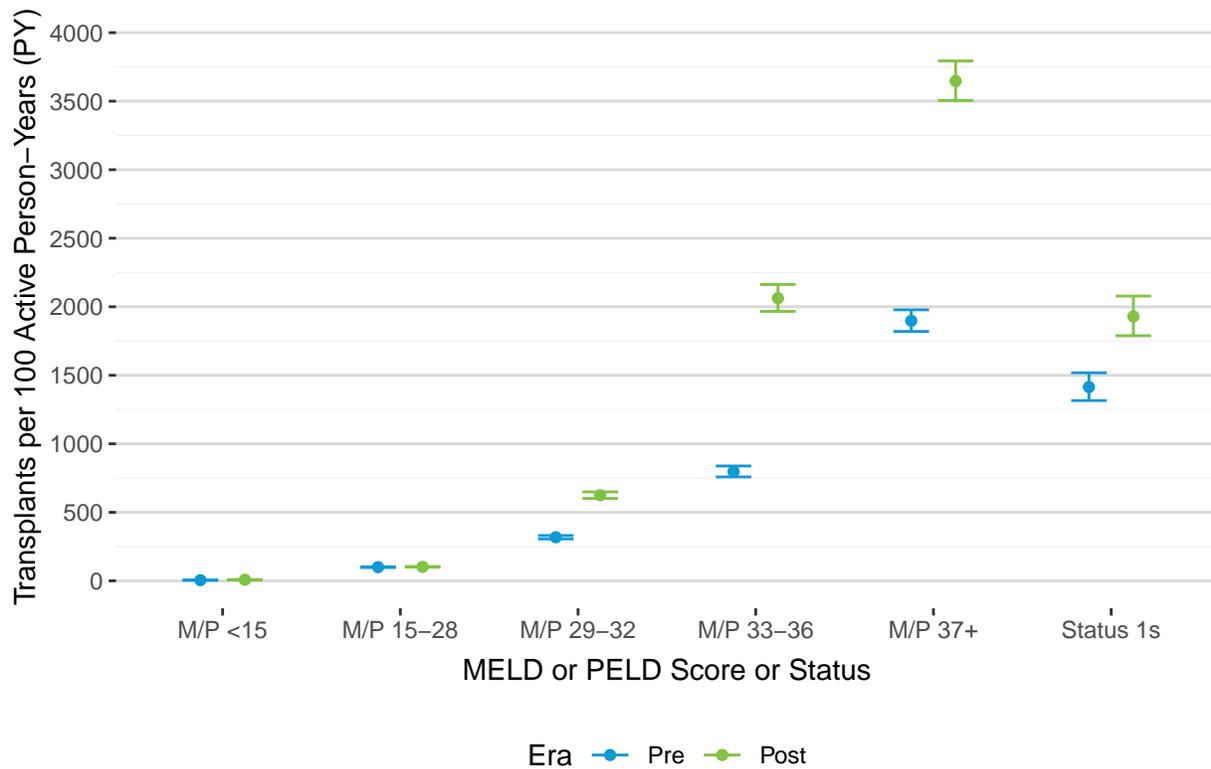
**Transplant Rates**

The following section looks at transplant rates by MELD or PELD score or status and various stratifications. Additional transplant rates by candidate ABO, candidate race/ethnicity, and candidate sex are in the **Appendix**.

Changes in the amount of waiting time and number of events for each score group determine changes in rates. In most cases of significant findings, there were fewer person-years, resulting in significantly different rates. Wide confidence intervals indicate small sample sizes.

Rates of transplant significantly increased post-policy for the MELD/PELD <15, MELD/PELD 29-32, MELD/PELD 33-36, and MELD/PELD 37+, and Status 1 groups, as indicated by non-overlapping confidence intervals and risk ratio confidence intervals >1, but did not significantly change for the MELD/PELD 15-28 group.

**Figure 12. Liver-Alone Transplant Rates Per 100 Active Person-Years Waiting by MELD or PELD Score or Status and Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 12. Liver-Along Transplant Rates Per 100 Active Person-Years Waiting by MELD or PELD Score or Status and Era**

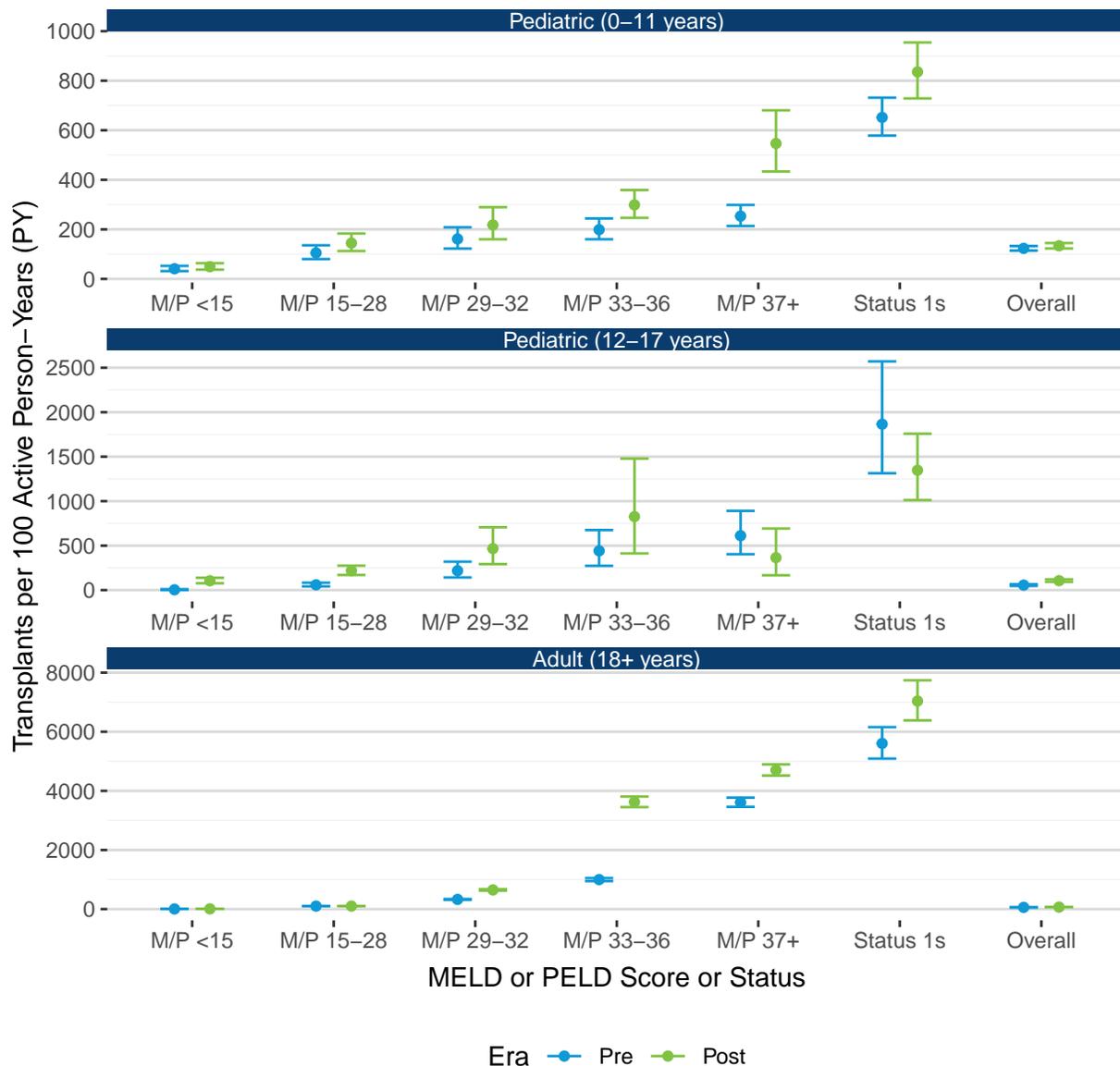
Score or Status Group	Era	Ever Waiting	Transplant Events	Person-Years	Transplants per 100 Active PY		Risk Ratio (vs. Pre-Policy)	
		N	N	PY	Estimate	95% CI	Estimate	95% CI
M/P <15	Pre	20065	562	11039.6	5.09	4.68, 5.53	Ref.	Ref.
	Post	18052	813	9730.1	8.36	7.79, 8.95	1.64	1.47, 1.83
M/P 15-28	Pre	20107	6659	6658.2	100.01	97.62, 102.44	Ref.	Ref.
	Post	19085	6535	6387.5	102.31	99.84, 104.82	1.02	0.99, 1.06
M/P 29-32	Pre	7128	2499	785.3	318.22	305.86, 330.94	Ref.	Ref.
	Post	5658	2621	419.5	624.79	601.09, 649.17	1.96	1.86, 2.07
M/P 33-36	Pre	3824	1560	195.6	797.64	758.54, 838.22	Ref.	Ref.
	Post	3326	1724	83.6	2062.61	1966.38, 2162.32	2.59	2.41, 2.77
M/P 37+	Pre	3486	2246	118.4	1897.53	1819.86, 1977.66	Ref.	Ref.
	Post	3403	2468	67.7	3646.90	3504.42, 3793.68	1.92	1.82, 2.03
Status 1s	Pre	1156	761	53.8	1414.07	1315.37, 1518.21	Ref.	Ref.
	Post	1027	697	36.1	1929.21	1788.63, 2077.91	1.36	1.23, 1.51

For pediatric candidates ages 0-11 years, transplant rates increased significantly post-policy for the PELD 33-36 and PELD 37+ groups. Transplant rates increased in all other PELD and Status 1 groups, although these changes were not statistically significant.

Pediatric candidates ages 12-17 years experienced statistically significant increases in transplant rates in the MELD/PELD <15 and MELD/PELD 15-28 groups post-policy compared to pre-policy.

Adult candidates also experienced statistically significant increases in transplant rates in the MELD <15, MELD 29-32, MELD 33-36, MELD 37+, and Status 1 groups post-policy compared to pre-policy.

**Figure 13. Liver-Alone Transplant Rates Per 100 Active Person-Years Waiting by MELD or PELD Score or Status, Age at Listing, and Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 13. Liver-Along Transplant Rates Per 100 Active Person-Years Waiting by MELD or PELD Score or Status, Age at Listing, and Era**

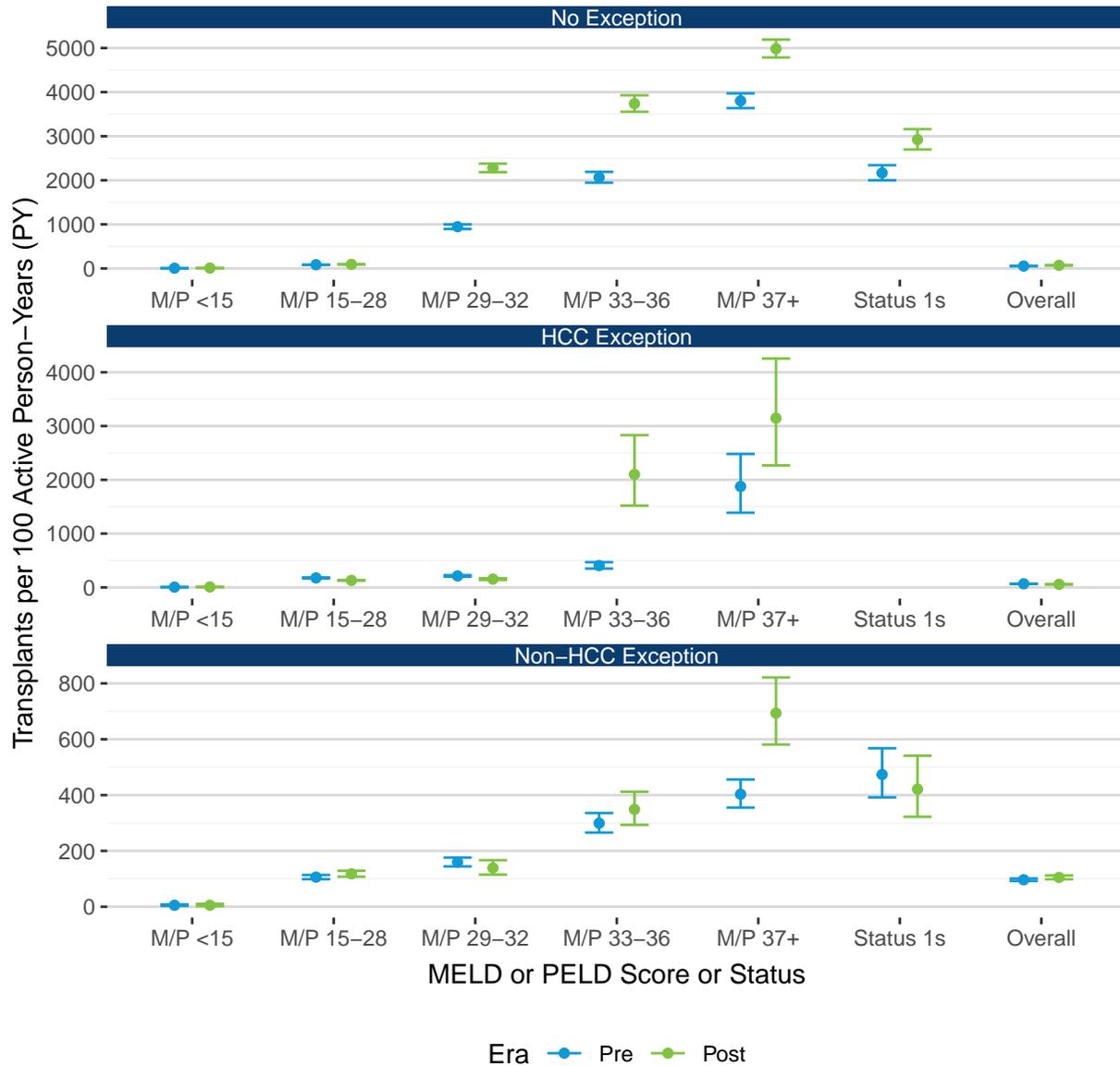
Age at Listing	Score or Status Group	Era	Ever Waiting	Transplant Events	Person-Years	Transplants per 100 Active PY	
			N	N	PY	Estimate	95% CI
Pediatric (0-11 years)	M/P <15	Pre	605	61	148.9	40.97	31.34, 52.63
		Post	480	59	119.9	49.20	37.45, 63.46
	M/P 15-28	Pre	403	59	56.2	104.99	79.92, 135.43
		Post	318	69	47.7	144.68	112.57, 183.11
	M/P 29-32	Pre	296	58	36.0	161.23	122.43, 208.43
		Post	164	47	21.6	217.70	159.96, 289.50
	M/P 33-36	Pre	316	91	45.8	198.77	160.04, 244.05
		Post	325	114	38.2	298.77	246.45, 358.92
	M/P 37+	Pre	310	143	56.4	253.39	213.56, 298.49
		Post	144	80	14.6	546.71	433.51, 680.43
	Status 1s	Pre	422	287	44.0	651.75	578.52, 731.68
		Post	345	218	26.1	835.82	728.54, 954.44
	Overall	Pre	1240	699	567.4	123.20	114.24, 132.68
		Post	1076	587	439.4	133.59	123.00, 144.85
Pediatric (12-17 years)	M/P <15	Pre	169	3	86.8	3.46	0.71, 10.10
		Post	162	48	45.8	104.70	77.20, 138.81
	M/P 15-28	Pre	181	35	58.7	59.63	41.53, 82.93
		Post	151	71	32.6	218.10	170.34, 275.11
	M/P 29-32	Pre	78	26	11.9	218.01	142.41, 319.44
		Post	53	22	4.7	466.59	292.41, 706.42
	M/P 33-36	Pre	45	21	4.8	441.79	273.47, 675.32
		Post	20	11	1.3	826.13	412.40, 1478.18
	M/P 37+	Pre	38	27	4.4	612.11	403.39, 890.59
		Post	15	9	2.5	364.59	166.72, 692.11
	Status 1s	Pre	72	37	2.0	1865.33	1313.37, 2571.11
		Post	91	54	4.0	1347.23	1012.08, 1757.85
	Overall	Pre	374	149	265.9	56.04	47.40, 65.79
		Post	388	215	203.0	105.93	92.24, 121.07
Adult	M/P <15	Pre	19294	498	10803.9	4.61	4.21, 5.03
		Post	17412	705	9564.3	7.37	6.84, 7.94
	M/P 15-28	Pre	19527	6564	6543.5	100.31	97.90, 102.77
		Post	18618	6396	6307.4	101.40	98.93, 103.92
	Pre	6755	2416	737.6	327.56	314.63, 340.89	

*(continued)*

Age at Listing	Score or Status Group	Era	N	N	PY	Estimate	95% CI
Adult (18+ years)	M/P 29-32	Post	5441	2552	393.2	649.03	624.09, 674.71
		Pre	3464	1448	145.0	998.32	947.55, 1051.10
	M/P 33-36	Post	2981	1599	44.1	3626.19	3450.61, 3808.39
		Pre	3138	2077	57.5	3611.06	3457.41, 3769.77
	M/P 37+	Post	3244	2379	50.6	4704.13	4516.98, 4897.04
		Pre	662	437	7.8	5604.53	5091.31, 6155.47
	Status 1s	Post	591	425	6.0	7038.34	6385.01, 7740.38
		Pre	32777	13440	23094.3	58.20	57.22, 59.19
	Overall	Post	32402	14056	20930.5	67.16	66.05, 68.28

Transplant rates in the non-exception group increased significantly in all MELD or PELD score or status groups post-policy compared to pre-policy. In the HCC exception group, transplant rates increased significantly in the MELD/PELD <15 and MELD/PELD 33-36 groups but decreased significantly in the MELD/PELD 15-28 and MELD/PELD 29-32 groups. In the non-HCC exception group, transplant rates increased significantly for the MELD/PELD 37+ group and remained similar in all other groups.

**Figure 14. Liver-Alone Transplant Rates Per 100 Active Person-Years Waiting by MELD or PELD Score or Status, Exception Status, and Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 14. Liver-Alone Transplant Rates Per 100 Active Person-Years Waiting by MELD or PELD Score or Status, Exception Status, and Era**

Exception Status	Score or Status Group	Era	Ever Waiting	Transplant Events	Person-Years	Transplants per 100 Active PY		
			N	N	PY	Estimate	95% CI	
No Exception	M/P <15	Pre	13109	410	8585.8	4.78	4.32, 5.26	
		Post	12610	647	7824.3	8.27	7.64, 8.93	
	M/P 15-28	Pre	13913	4203	4972.7	84.52	81.99, 87.12	
		Post	14023	4215	4542.1	92.80	90.02, 95.64	
	M/P 29-32	Pre	4093	1274	134.5	946.93	895.64, 1000.39	
		Post	4394	2154	94.5	2280.46	2185.16, 2378.84	
	M/P 33-36	Pre	2805	1107	53.6	2065.62	1945.71, 2190.98	
		Post	2861	1559	41.7	3738.00	3554.73, 3928.26	
	M/P 37+	Pre	2968	2010	52.9	3801.10	3636.72, 3970.99	
		Post	3139	2345	47.0	4985.00	4785.26, 5190.94	
	Status 1s	Pre	988	631	29.1	2166.85	2001.06, 2342.72	
		Post	934	630	21.6	2922.60	2698.81, 3160.00	
	Overall	Pre	25612	9635	17703.4	54.42	53.34, 55.52	
		Post	26827	11550	16369.1	70.56	69.28, 71.86	
HCC Exception	M/P <15	Pre	5220	108	2095.8	5.15	4.23, 6.22	
		Post	4616	139	1757.5	7.91	6.65, 9.34	
	M/P 15-28	Pre	4163	1709	972.6	175.72	167.49, 184.25	
		Post	3964	1886	1446.2	130.41	124.59, 136.43	
	M/P 29-32	Pre	1895	866	406.3	213.12	199.16, 227.80	
		Post	901	372	242.1	153.63	138.42, 170.07	
	M/P 33-36	Pre	373	187	46.1	405.77	349.70, 468.28	
		Post	119	43	2.0	2101.07	1520.56, 2830.13	
	M/P 37+	Pre	92	49	2.6	1876.71	1388.40, 2481.10	
		Post	62	42	1.3	3147.84	2268.69, 4254.97	
	Overall	Pre	6188	2919	4349.0	67.12	64.71, 69.60	
		Post	5698	2483	4332.6	57.31	55.08, 59.61	
	No Exception	M/P <15	Pre	1860	19	363.0	5.23	3.15, 8.17
			Post	906	8	152.7	5.24	2.26, 10.32
M/P 15-28		Pre	2186	772	728.3	106.00	98.65, 113.75	
		Post	1208	482	408.6	117.95	107.65, 128.97	
M/P 29-32		Pre	1185	397	248.7	159.66	144.33, 176.16	
		Post	373	116	83.4	139.03	114.88, 166.75	
Overall		Pre	661	289	96.6	299.20	265.69, 335.76	
		Post						

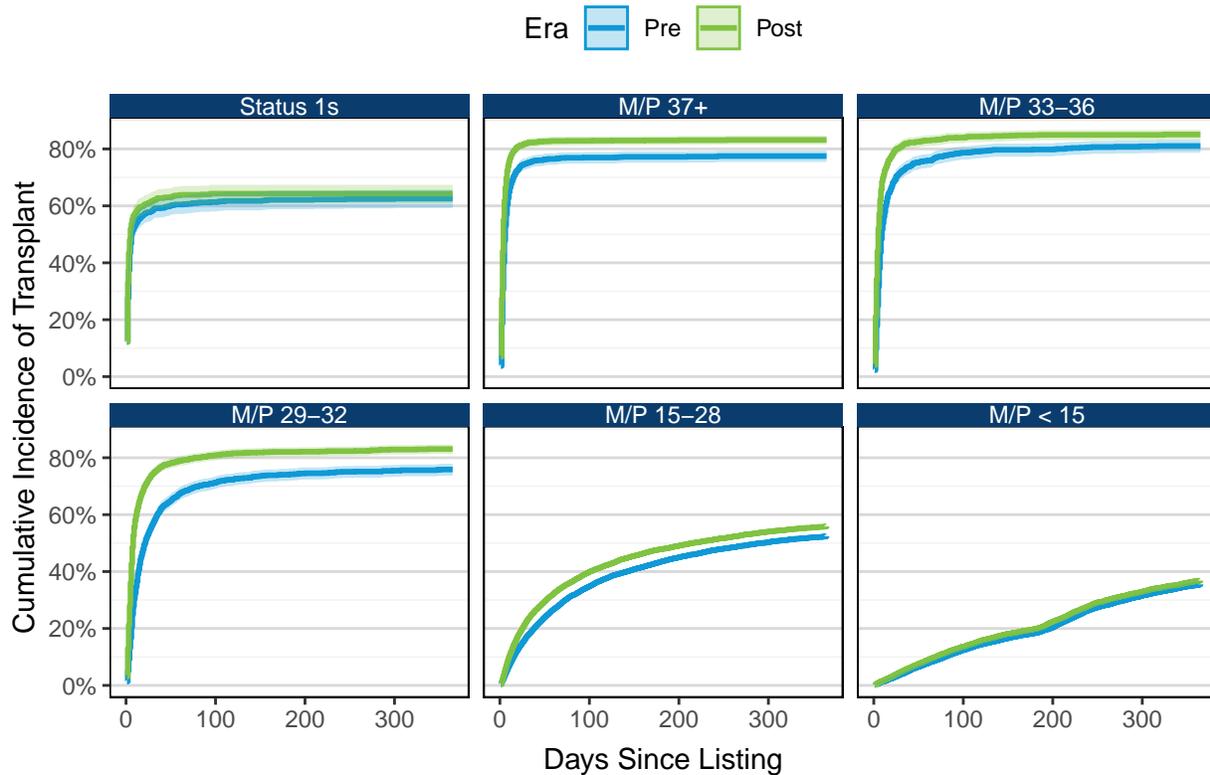
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Exception Status	Score or Status Group	Era	N	N	PY	Estimate	95% CI
Non-HCC Exception	M/P 33-36	Post	351	139	39.8	348.89	293.30, 411.94
		Pre	443	254	63.0	403.16	355.10, 455.91
	M/P 37+	Post	210	134	19.3	693.56	581.11, 821.43
		Pre	181	117	24.7	473.76	391.81, 567.79
	Status 1s	Post	99	61	14.5	421.29	322.25, 541.16
		Pre	3027	1848	1912.8	96.61	92.26, 101.12
	Overall	Post	1650	940	895.2	105.01	98.40, 111.94
		Pre					

**Cumulative Incidence**

The following figure shows the cumulative incidence of deceased or living donor transplant by MELD or PELD score or status and era. Post-policy, the probability of transplant within 90 days is significantly higher in the MELD/PELD 15-28, MELD/PELD 29-32, MELD/PELD 33-36 and MELD/PELD 37+ groups compared to pre-policy. 90 day estimates are higher post-policy compared to pre-policy in the Status 1A/1B and MELD <15 groups, but differences are not statistically significant.

**Figure 15. Cumulative Incidence of Transplant for Liver Waitlist Additions by MELD or PELD Score or Status and Era**



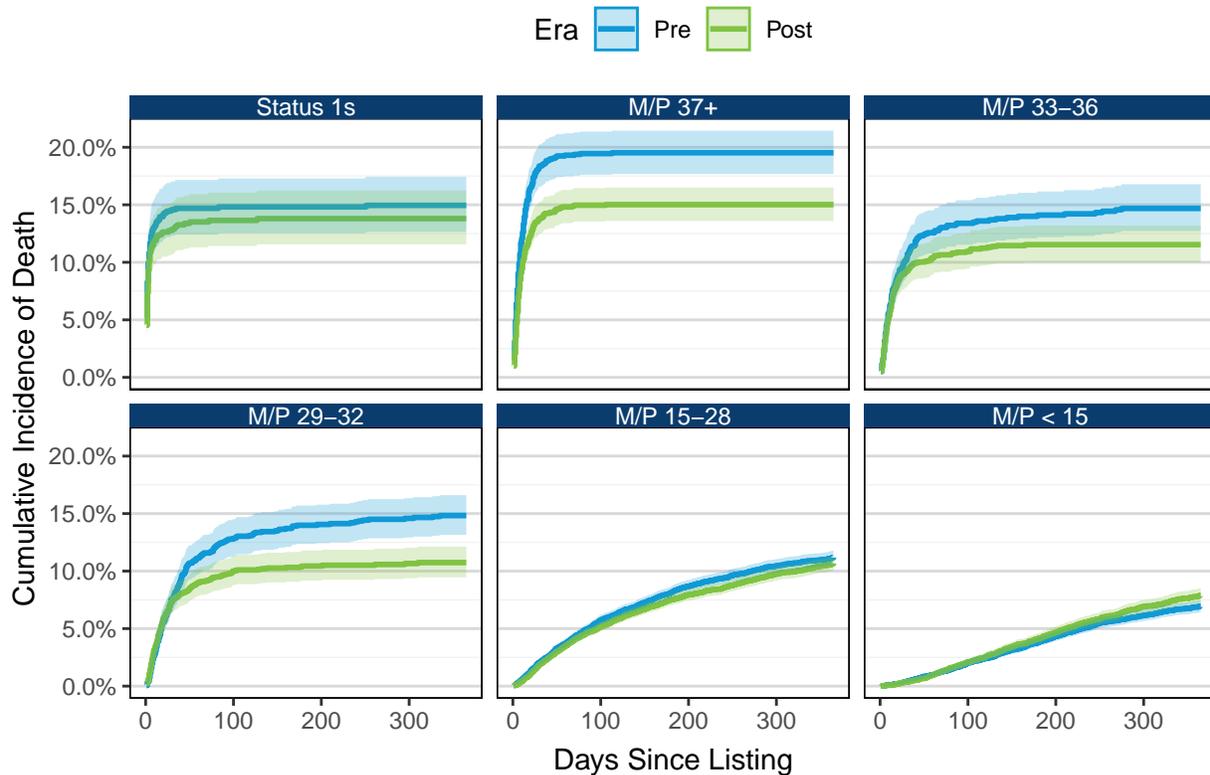
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 15. Cumulative Incidence of Transplant for Liver Waitlist Additions by MELD or PELD Score or Status and Era**

Score or Status Group	Era	90 Days		180 Days		365 Days	
		Est	95% CI	Est	95% CI	Est	95% CI
Status 1s	Pre	61.2%	(57.9%, 64.4%)	62.1%	(58.8%, 65.3%)	62.5%	(59.2%, 65.7%)
	Post	64.0%	(60.7%, 67.1%)	64.3%	(61.0%, 67.4%)	64.3%	(61.0%, 67.4%)
M/P 37+	Pre	76.9%	(74.8%, 78.8%)	77.2%	(75.2%, 79.2%)	77.5%	(75.4%, 79.4%)
	Post	82.9%	(81.3%, 84.3%)	83.0%	(81.4%, 84.5%)	83.2%	(81.6%, 84.6%)
M/P 33-36	Pre	78.2%	(75.8%, 80.5%)	79.8%	(77.4%, 82.0%)	81.1%	(78.7%, 83.2%)
	Post	83.9%	(82.0%, 85.6%)	84.9%	(83.0%, 86.6%)	85.1%	(83.2%, 86.8%)
M/P 29-32	Pre	70.6%	(68.3%, 72.7%)	74.0%	(71.9%, 76.1%)	75.9%	(73.7%, 77.9%)
	Post	80.5%	(78.7%, 82.1%)	82.1%	(80.4%, 83.6%)	83.1%	(81.4%, 84.6%)
M/P 15-28	Pre	33.2%	(32.4%, 34.1%)	43.5%	(42.6%, 44.4%)	52.3%	(51.4%, 53.3%)
	Post	38.3%	(37.4%, 39.1%)	47.9%	(46.9%, 48.8%)	55.8%	(54.9%, 56.8%)
M/P < 15	Pre	11.3%	(10.7%, 12.0%)	18.4%	(17.6%, 19.2%)	35.5%	(34.5%, 36.5%)
	Post	12.7%	(12.0%, 13.4%)	19.9%	(19.0%, 20.7%)	36.8%	(35.7%, 37.9%)

This next figure looks at cumulative incidence of removal for death or too sick by MELD or PELD score or status and era. The 90 day, 180 day, and 365 day probability of removal for death or too sick is significantly lower post-policy compared to pre-policy in the MELD/PELD 37+ group. In the MELD/PELD 29-32 group, the 180 day and 365 day probability of removal for death or too sick is significantly lower post-policy compared to pre-policy.

**Figure 16. Cumulative Incidence of Removal for Death or Too Sick for Liver Waitlist Additions by MELD or PELD Score or Status and Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

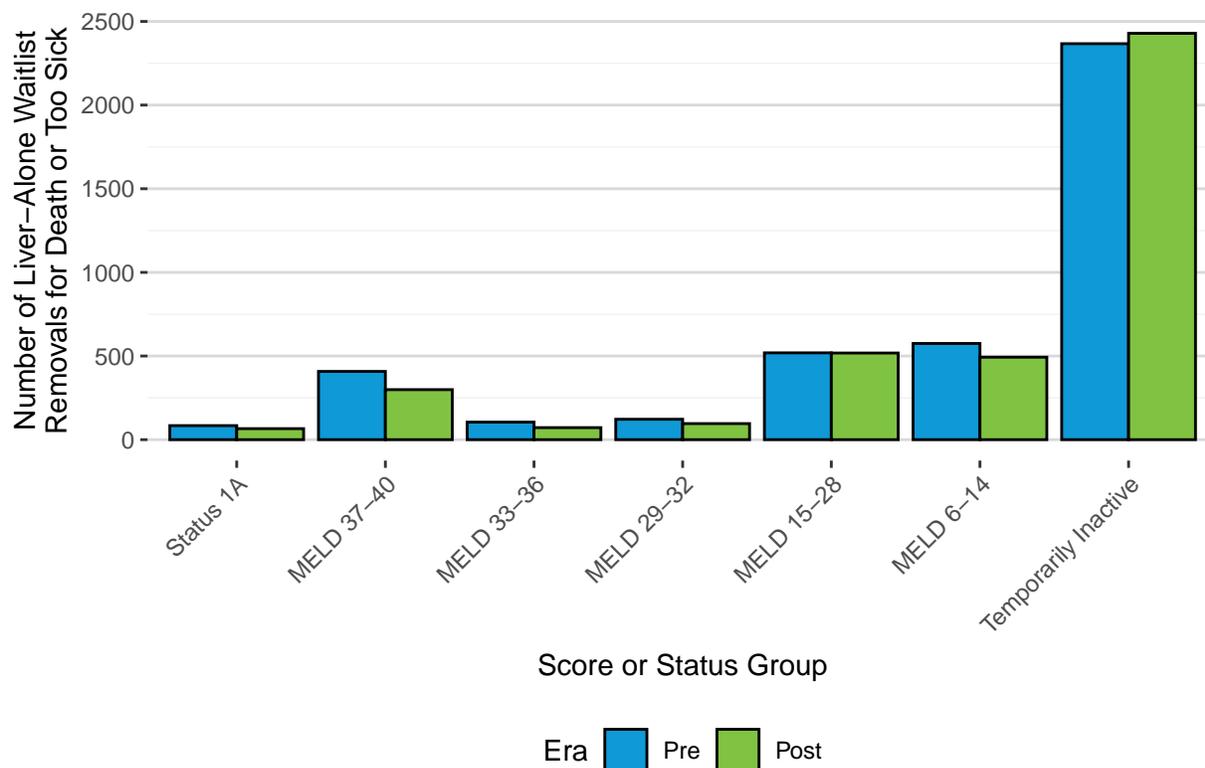
**Table 16. Cumulative Incidence of Death for Liver Waitlist Additions by MELD or PELD Score or Status and Era**

Score or Status Group	Era	90 Days		180 Days		365 Days	
		Est	95% CI	Est	95% CI	Est	95% CI
Status 1s	Pre	14.8%	(12.5%, 17.3%)	14.8%	(12.5%, 17.3%)	15.0%	(12.6%, 17.4%)
	Post	13.6%	(11.4%, 16.1%)	13.8%	(11.6%, 16.2%)	13.8%	(11.6%, 16.2%)
M/P 37+	Pre	19.5%	(17.6%, 21.4%)	19.5%	(17.7%, 21.4%)	19.5%	(17.7%, 21.4%)
	Post	15.0%	(13.5%, 16.5%)	15.0%	(13.6%, 16.5%)	15.0%	(13.6%, 16.5%)
M/P 33-36	Pre	13.4%	(11.5%, 15.4%)	14.1%	(12.2%, 16.2%)	14.7%	(12.7%, 16.8%)
	Post	10.9%	(9.4%, 12.5%)	11.5%	(10.0%, 13.2%)	11.5%	(10.0%, 13.2%)
M/P 29-32	Pre	12.6%	(11.0%, 14.2%)	14.0%	(12.4%, 15.7%)	14.8%	(13.1%, 16.6%)
	Post	9.7%	(8.5%, 11.0%)	10.4%	(9.2%, 11.8%)	10.7%	(9.5%, 12.1%)
M/P 15-28	Pre	5.2%	(4.8%, 5.6%)	8.2%	(7.7%, 8.7%)	11.2%	(10.6%, 11.8%)
	Post	4.8%	(4.4%, 5.2%)	7.5%	(7.0%, 8.0%)	10.7%	(10.1%, 11.3%)
M/P < 15	Pre	1.7%	(1.4%, 2.0%)	3.8%	(3.4%, 4.2%)	6.9%	(6.4%, 7.5%)
	Post	1.8%	(1.6%, 2.1%)	4.1%	(3.7%, 4.6%)	7.9%	(7.3%, 8.5%)

### Waitlist Removals for Death or Too Sick

Overall, there were fewer adult liver-alone registrations removed for death or too sick to transplant post-policy (3,973) compared to pre-policy (4,180).

**Figure 19. Adult Liver-Alone Registrations Removed for Death or Too Sick by MELD Score or Status Group**



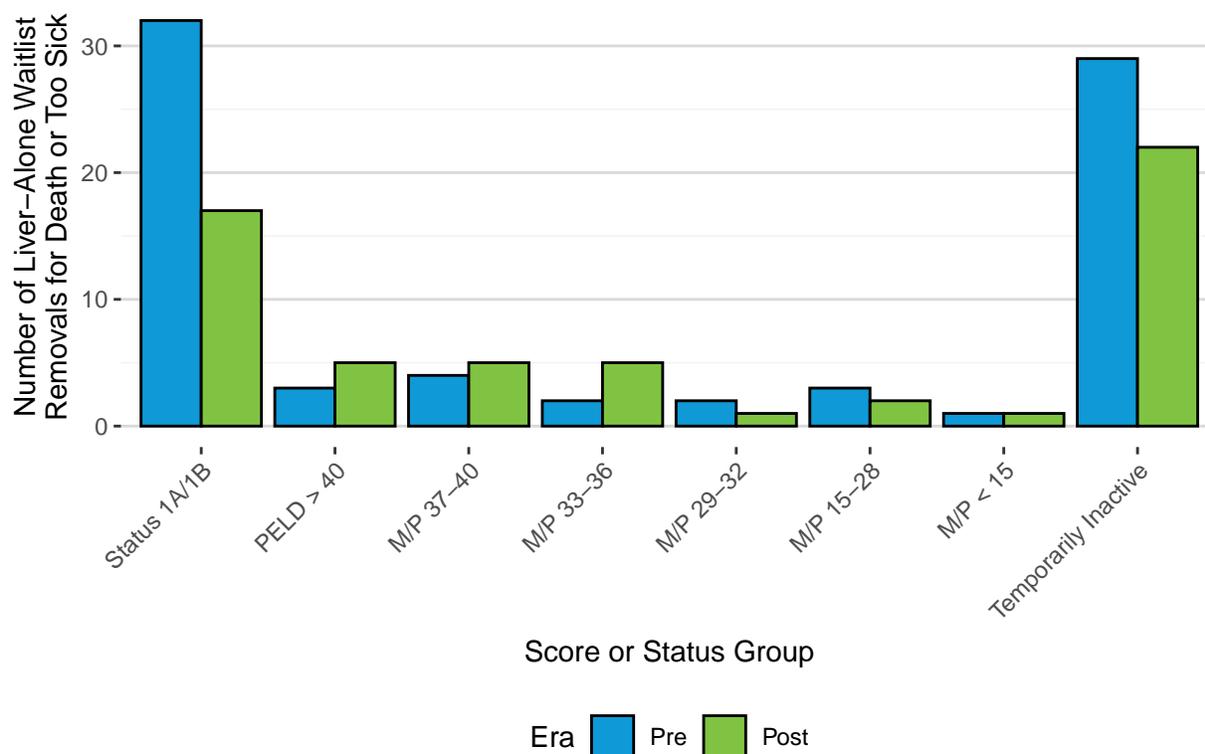
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 18. Adult Liver-Alone Registrations Removed for Death or Too Sick by MELD Score or Status Group**

Score or Status Group	Pre-Policy	Post-Policy
Status 1A	84 (2.0%)	66 (1.7%)
MELD 37-40	408 (9.8%)	299 (7.5%)
MELD 33-36	105 (2.5%)	72 (1.8%)
MELD 29-32	122 (2.9%)	96 (2.4%)
MELD 15-28	519 (12.4%)	518 (13.0%)
MELD 6-14	575 (13.8%)	493 (12.4%)
Temporarily Inactive	2367 (56.6%)	2429 (61.1%)
<b>Total</b>	<b>4180 (100.0%)</b>	<b>3973 (100.0%)</b>

There were also fewer pediatric liver-alone registrations removed for death or too sick post-policy (58) compared to pre-policy (76), with a notable decrease in removals for death or too sick in the Status 1A/1B group.

**Figure 20. Pediatric Liver-Alone Registrations Removed for Death or Too Sick by MELD or PELD Score or Status Group**



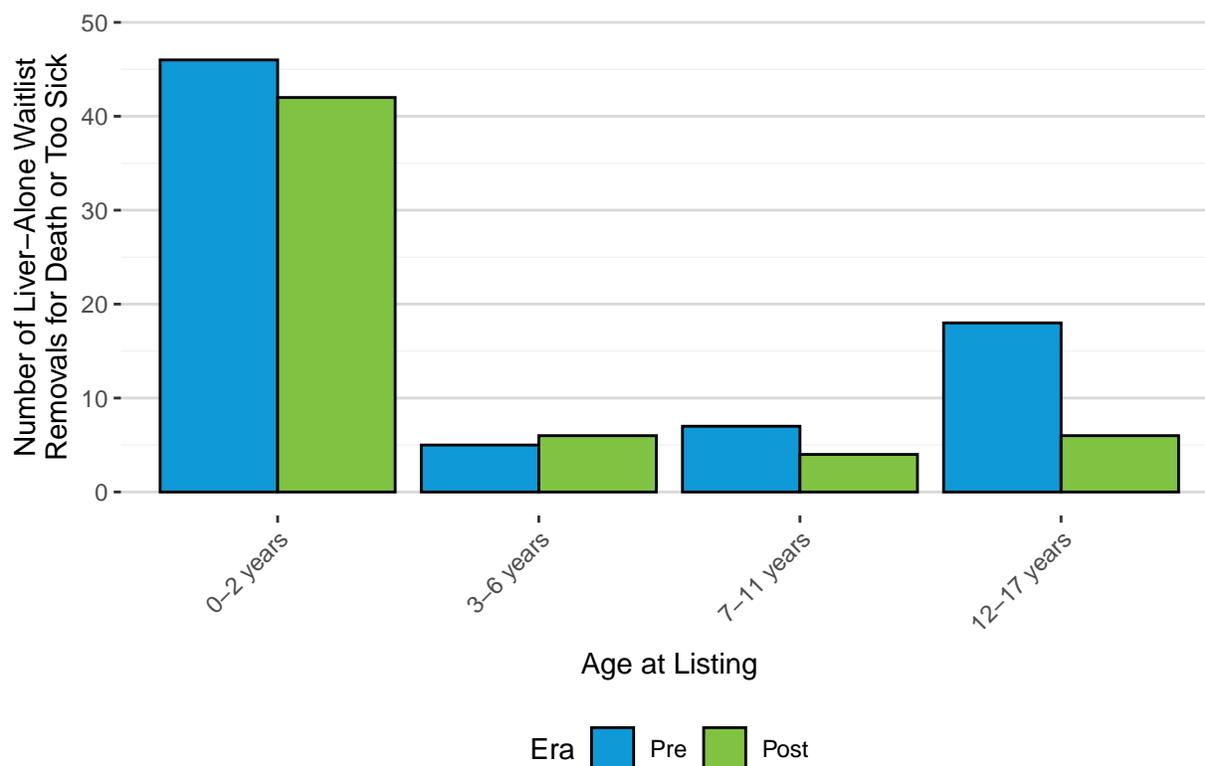
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 19. Pediatric Liver-Alone Registrations Removed for Death or Too Sick by MELD or PELD Score or Status Group**

Score or Status Group	Pre-Policy	Post-Policy
Status 1A/1B	32 (42.1%)	17 (29.3%)
PELD > 40	3 (3.9%)	5 (8.6%)
M/P 37-40	4 (5.3%)	5 (8.6%)
M/P 33-36	2 (2.6%)	5 (8.6%)
M/P 29-32	2 (2.6%)	1 (1.7%)
M/P 15-28	3 (3.9%)	2 (3.4%)
M/P < 15	1 (1.3%)	1 (1.7%)
Temporarily Inactive	29 (38.2%)	22 (37.9%)
Total	76 (100.0%)	58 (100.0%)

Post-policy, there were fewer removals for death or too sick in the 0-2 year old, 7-11 year old, and 12-17 year old age groups. There was one additional removal for death or too sick post-policy in the 3-6 year old age group.

**Figure 21. Pediatric Liver-Alone Registrations Removed for Death or Too Sick by Age at Listing**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

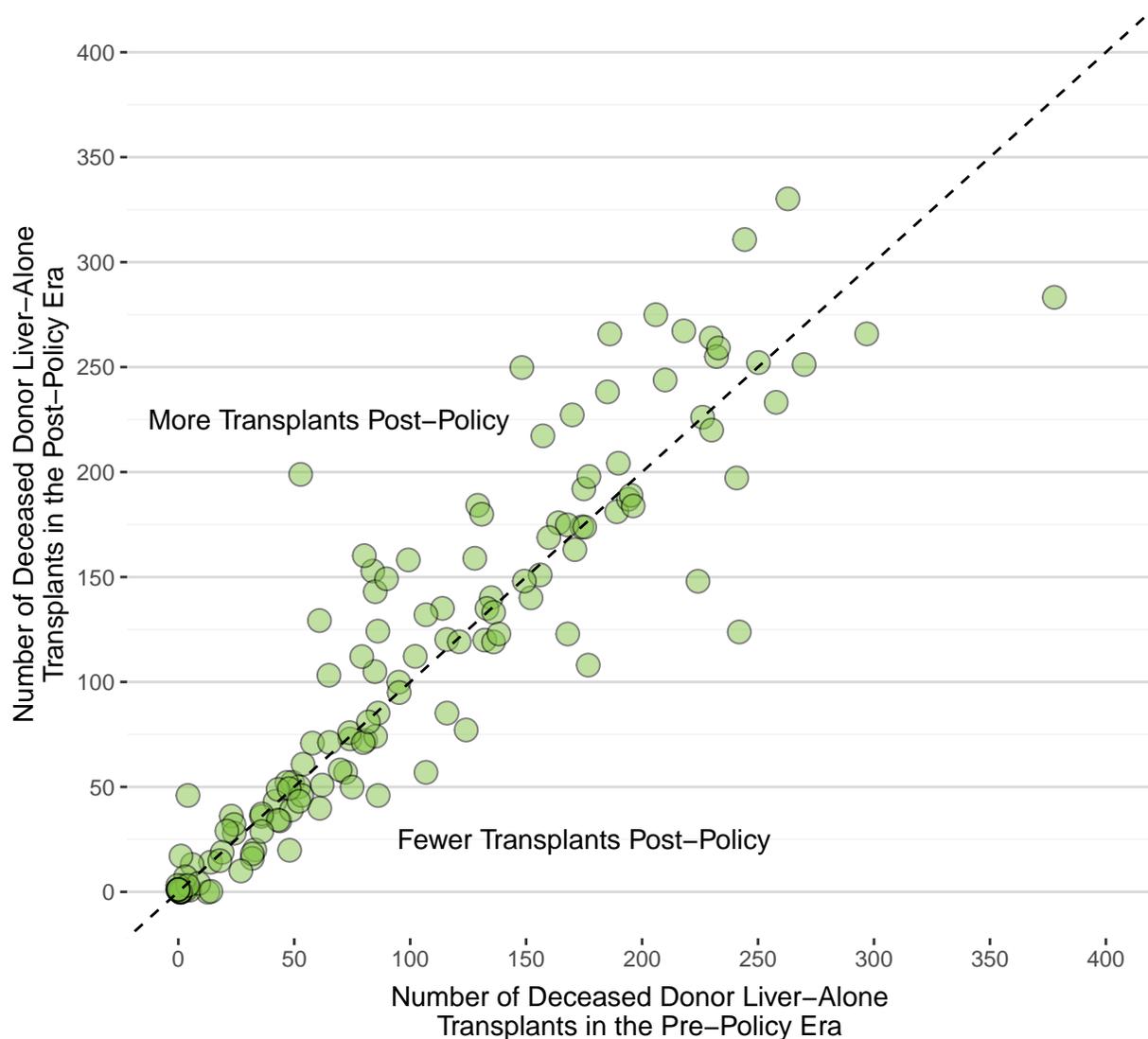
**Table 20. Pediatric Liver-Alone Registrations Removed for Death or Too Sick by Age at Listing**

Age at Listing	Pre-Policy	Post-Policy
0-2 years	46 (60.5%)	42 (72.4%)
3-6 years	5 (6.6%)	6 (10.3%)
7-11 years	7 (9.2%)	4 (6.9%)
12-17 years	18 (23.7%)	6 (10.3%)
Total	76 (100.0%)	58 (100.0%)

## Section II. Deceased Donor Liver Transplants

### Adult Liver-Alone Transplants

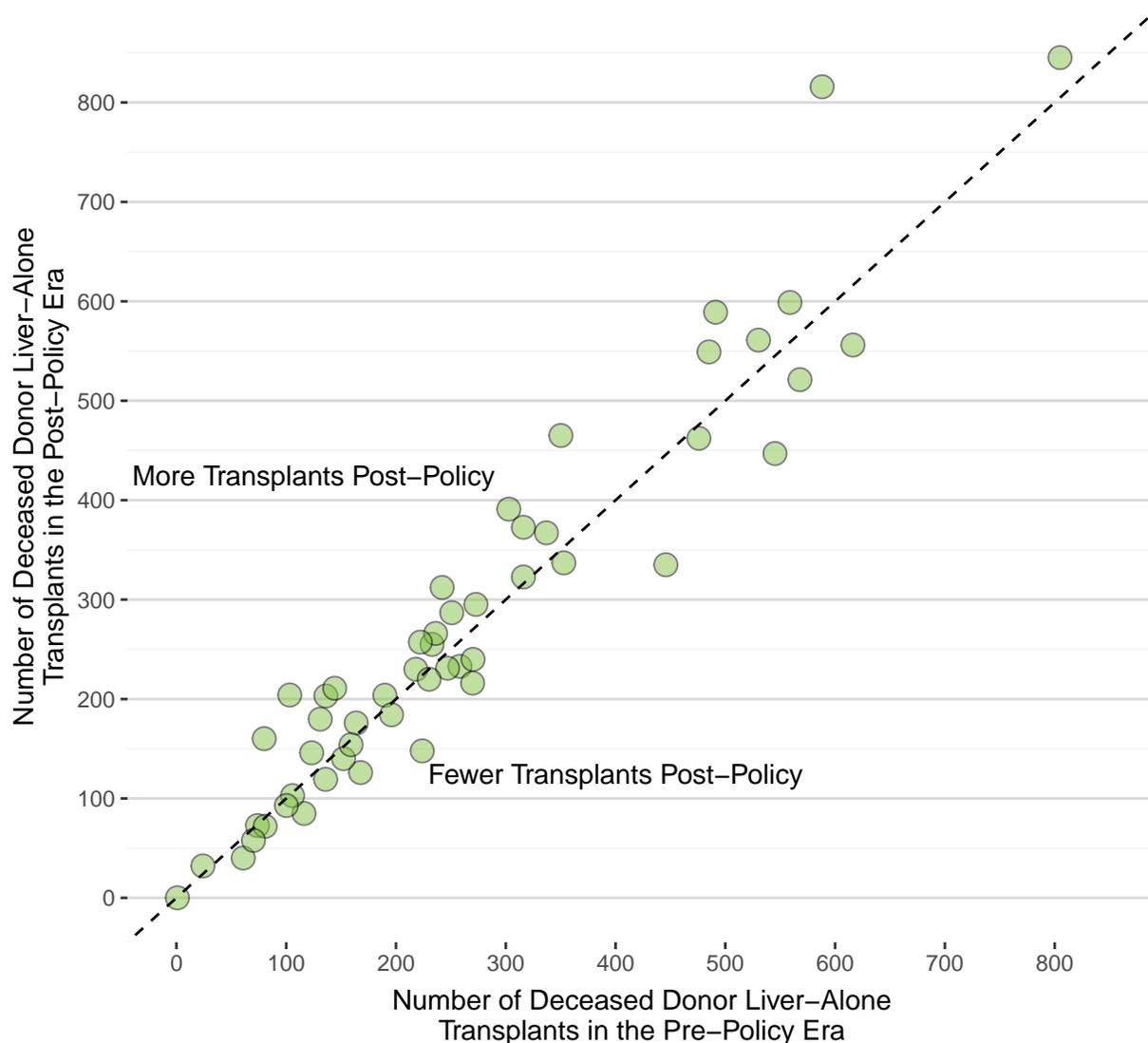
Figure 22. Adult Deceased Donor Liver-Alone Transplants by Transplant Program and Era



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

Any points along the diagonal dashed line indicate no changes in the absolute number of adult deceased donor liver-alone transplants by program, pre- to post-policy. Points that fall above the diagonal represent programs that performed more deceased donor liver transplants post-policy compared to pre-policy. Points that fall below the diagonal represent programs that performed fewer deceased donor liver transplants post-policy compared to pre-policy. A table of adult deceased donor liver-alone transplants by transplant program and era can be found in the **Appendix**.

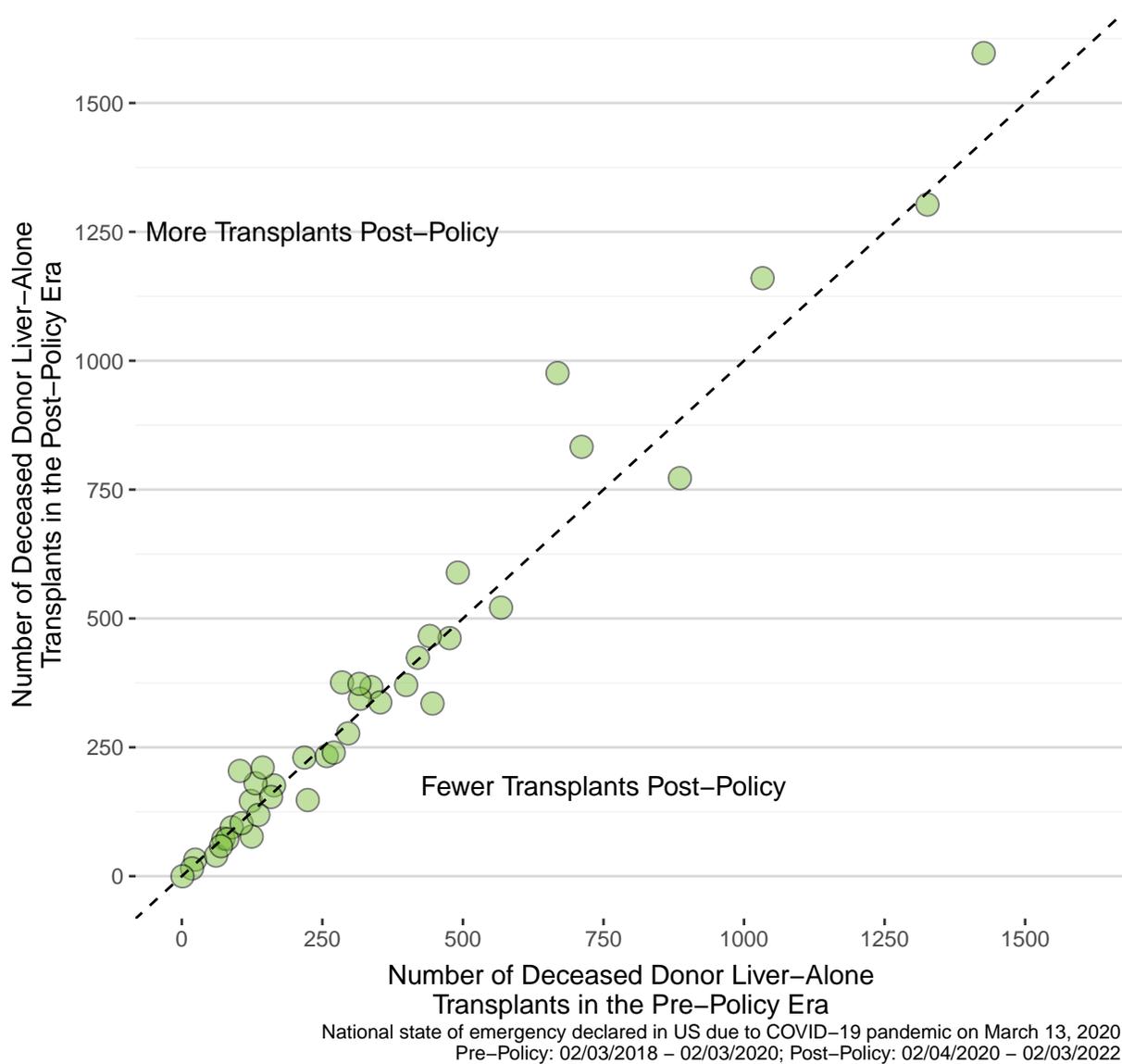
The majority of programs performed similar number of adult deceased donor liver transplants pre-policy compared to post-policy. A Spearman's rank correlation of  $\rho = 0.941$  indicates a strong positive, monotonic relationship between these two measures. The Kruskal-Wallis test indicated that there was not a statistically significant change pre- to post-policy in the number of deceased donor, liver-alone transplants performed per transplant program ( $\chi^2_1 = 0.3934$ ,  $p = 0.531$ ).

**Figure 23. Adult Deceased Donor Liver-Alone Transplants by Transplant Program DSA and Era**

National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

Any points along the diagonal dashed line indicate no changes in the absolute number of adult deceased donor liver-alone transplants by DSA, pre- to post-policy. Points that fall above the diagonal represent DSAs that performed more deceased donor liver transplants post-policy compared to pre-policy. Points that fall below the diagonal represent DSAs that performed fewer deceased donor liver transplants post-policy compared to pre-policy. A table of adult deceased donor liver-alone transplants by transplant program DSA and era can be found in the **Appendix**.

The majority of DSAs had a similar number of deceased donor liver transplants pre- and post-policy. A Spearman's rank correlation of  $\rho = 0.954$  indicates a strong positive, monotonic relationship between these two measures. The Kruskal-Wallis test indicated that there was not a statistically significant change pre- to post-policy in the number of deceased donor, liver-alone transplants performed within each DSA ( $\chi^2_1 = 0.2072$ ,  $p = 0.649$ ).

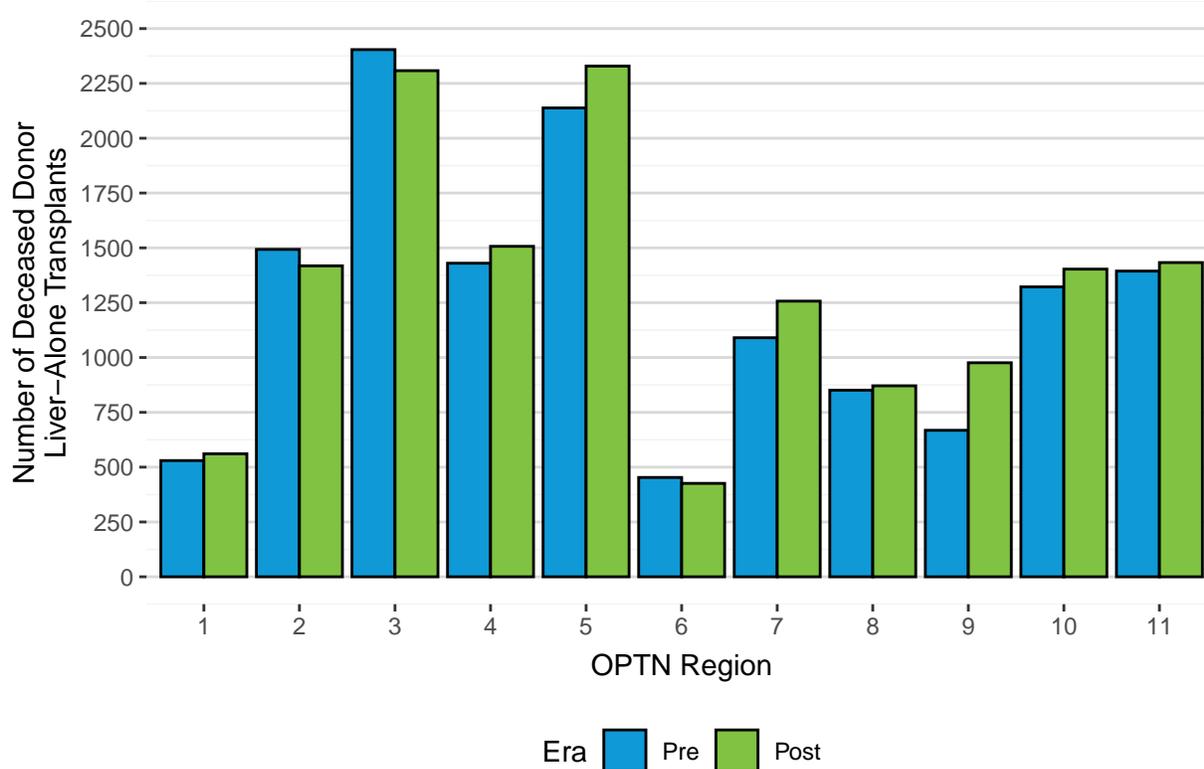
**Figure 24. Adult Deceased Donor Liver-Alone Transplants by State and Era**

Any points along the diagonal dashed line indicate no changes in the absolute number of adult deceased donor liver-alone transplants by state, pre- to post-policy. Points that fall above the diagonal represent states that performed more deceased donor liver transplants post-policy compared to pre-policy. Points that fall below the diagonal represent states that performed fewer deceased donor liver transplants post-policy compared to pre-policy. A table of adult deceased donor liver-alone transplants by transplant program state and era can be found in the **Appendix**.

The majority of states had similar number of deceased donor liver transplants post-policy compared to pre-policy. A Spearman's rank correlation of  $\rho = 0.971$  indicates a strong positive, monotonic relationship between these two measures. The Kruskal-Wallis test indicated that there was not a statistically significant change pre- to post-policy in the number of deceased donor, liver-alone transplants performed in each state ( $\chi^2_1 = 0.0924$ ,  $p = 0.761$ ).

Adult transplant recipients are 18 years or older at transplant. There were a greater number of adult deceased donor liver-alone transplants performed post-policy compared to pre-policy (percent change 5.2%). Regions 1, 4, 5, 7, 8, 9, 10, and 11 experienced increases in the number of adult transplants. Regions 2, 3, and 6 experienced a decrease.

**Figure 25. Adult Deceased Donor Liver-Alone Transplants by OPTN Region and Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

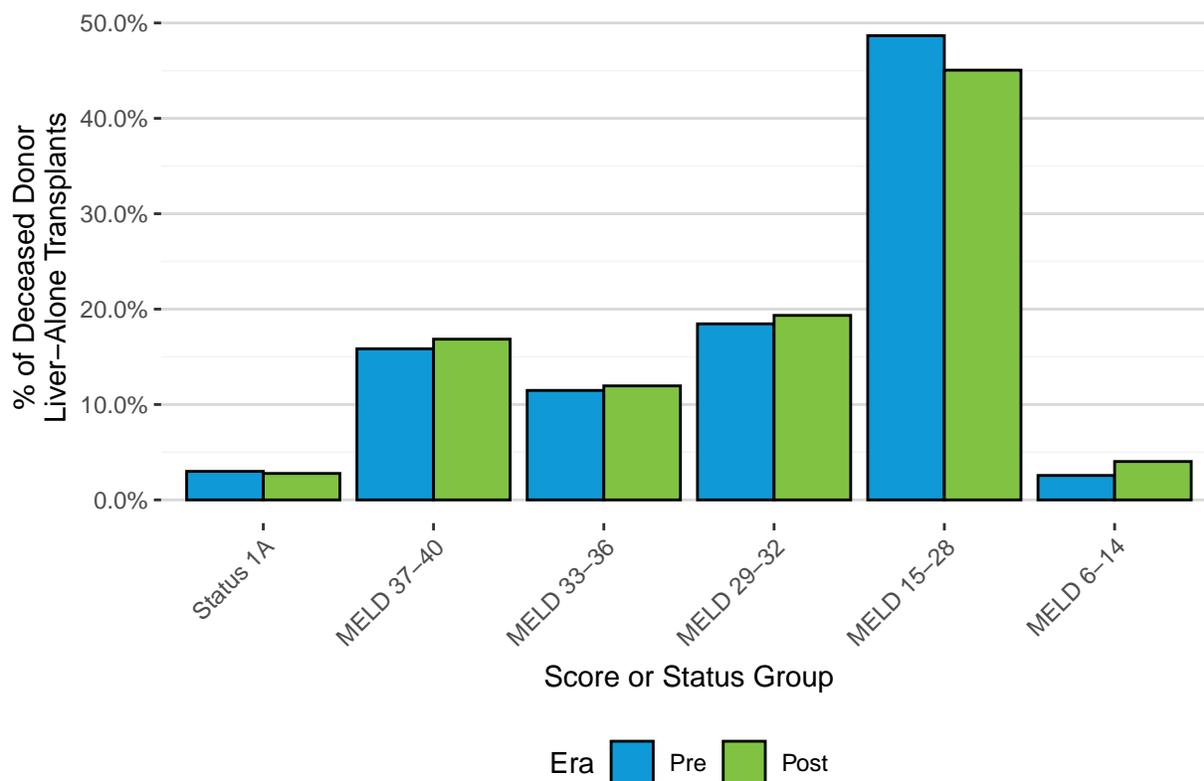
**Table 21. Number and Percent of Adult Deceased Donor Liver-Alone Transplants by OPTN Region and Era**

OPTN Region	Pre-Policy	Post-Policy
1	530 (3.8%)	561 (3.9%)
2	1493 (10.8%)	1418 (9.8%)
3	2404 (17.5%)	2308 (15.9%)
4	1430 (10.4%)	1507 (10.4%)
5	2138 (15.5%)	2329 (16.1%)
6	453 (3.3%)	426 (2.9%)
7	1090 (7.9%)	1257 (8.7%)
8	851 (6.2%)	871 (6.0%)
9	668 (4.9%)	976 (6.7%)
10	1322 (9.6%)	1403 (9.7%)
11	1394 (10.1%)	1433 (9.9%)
Total	13773 (100.0%)	14489 (100.0%)

Similar percentages of transplants occurred within each score group pre- and post policy, with a slight decrease in the proportion of transplant recipients with MELD scores of 15-28. The national median allocation MELD score at transplant was 28 pre-policy and 28 post-policy.

Changes in recipient score at transplant were variable across the country. This is illustrated by OPTN Region in the **Appendix**; however, these changes may be even more variable when considered at smaller units such as DSAs, states, or transplant programs due to smaller sample sizes and the differential impact of COVID-19 across the country.

**Figure 26. Adult Deceased Donor Liver-Alone Transplants by Allocation MELD Score or Status and Era**



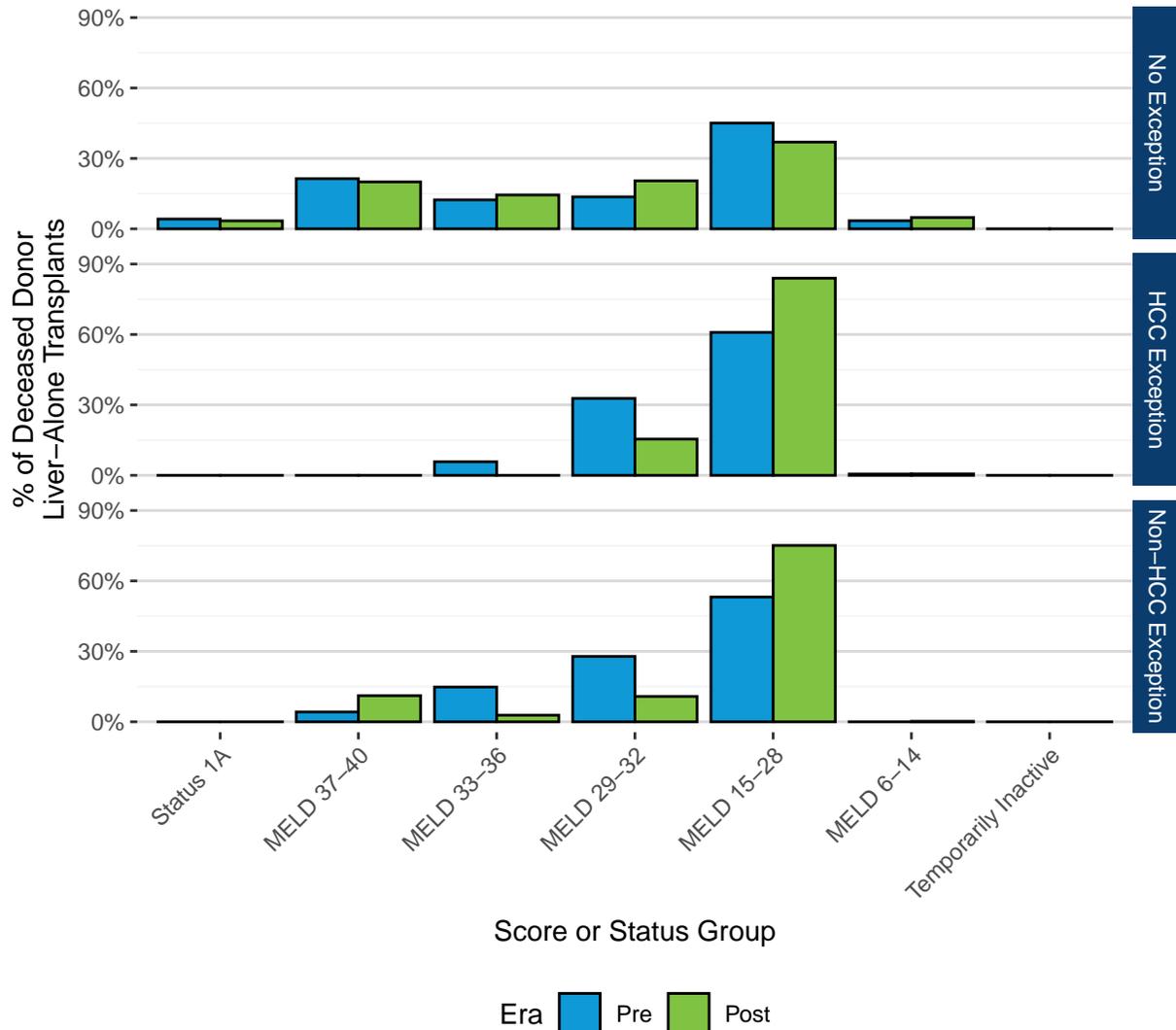
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 22. Number and Percent of Adult Deceased Donor Liver-Alone Transplants by Allocation MELD Score or Status and Era**

Score or Status Group	Pre-Policy	Post-Policy
Status 1A	412 (3.0%)	402 (2.8%)
MELD 37-40	2182 (15.8%)	2441 (16.8%)
MELD 33-36	1581 (11.5%)	1732 (12.0%)
MELD 29-32	2542 (18.5%)	2803 (19.3%)
MELD 15-28	6703 (48.7%)	6528 (45.1%)
MELD 6-14	353 (2.6%)	583 (4.0%)
Total	13773 (100.0%)	14489 (100.0%)

The distributions of allocation MELD scores or status at transplant by exception status for adult recipients changed pre- versus post-policy, particularly for HCC and non-HCC exception recipients. The large majority of both HCC and non-HCC exception transplant recipients have MELD scores of 15-28 post-policy. There has been an increase in non-HCC exception recipients with high MELD scores of 37-40, and fewer with scores of 29-36. Non-exception transplant recipients had fairly similar MELD scores or statuses pre- versus post-policy.

**Figure 27. Adult Deceased Donor Liver-Alone Transplants by Allocation MELD Score or Status, Exception Status, and Era**



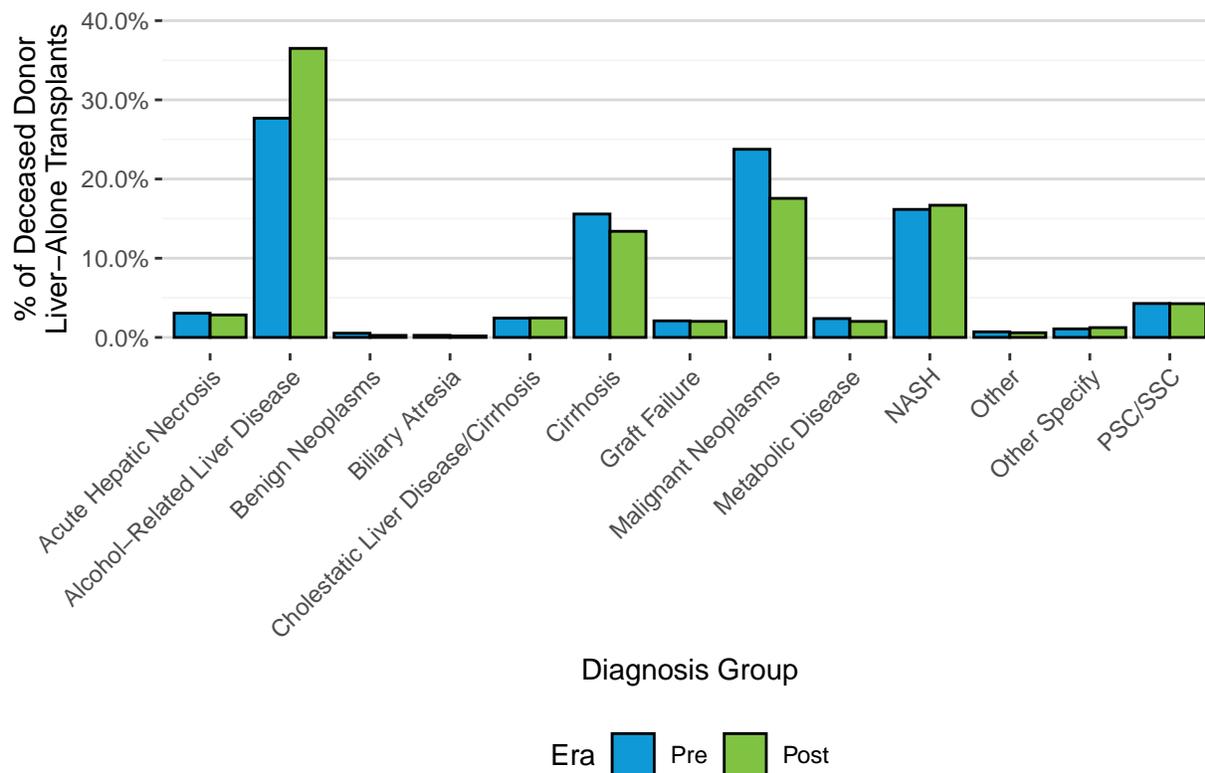
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 23. Number and Percent of Adult Deceased Donor Liver-Alone Transplants by Allocation MELD Score or Status, Exception Status, and Era**

Exception Type	Score or Status Group	Pre-Policy	Post-Policy
No Exception	Status 1A	412 (4.2%)	402 (3.4%)
	MELD 37-40	2120 (21.4%)	2373 (20.0%)
	MELD 33-36	1225 (12.4%)	1715 (14.4%)
	MELD 29-32	1351 (13.6%)	2429 (20.4%)
	MELD 15-28	4467 (45.1%)	4392 (37.0%)
	MELD 6-14	340 (3.4%)	570 (4.8%)
	Temporarily Inactive	0 (0.0%)	0 (0.0%)
	Total	9915 (100.0%)	11881 (100.0%)
HCC Exception	Status 1A	0 (0.0%)	0 (0.0%)
	MELD 37-40	0 (0.0%)	0 (0.0%)
	MELD 33-36	138 (5.8%)	0 (0.0%)
	MELD 29-32	781 (32.7%)	308 (15.4%)
	MELD 15-28	1453 (60.9%)	1677 (84.0%)
	MELD 6-14	13 (0.5%)	12 (0.6%)
	Temporarily Inactive	0 (0.0%)	0 (0.0%)
	Total	2385 (100.0%)	1997 (100.0%)
Non-HCC Exception	Status 1A	0 (0.0%)	0 (0.0%)
	MELD 37-40	62 (4.2%)	68 (11.1%)
	MELD 33-36	218 (14.8%)	17 (2.8%)
	MELD 29-32	410 (27.8%)	66 (10.8%)
	MELD 15-28	783 (53.2%)	459 (75.1%)
	MELD 6-14	0 (0.0%)	1 (0.2%)
	Temporarily Inactive	0 (0.0%)	0 (0.0%)
	Total	1473 (100.0%)	611 (100.0%)

Consistent with the larger proportion of adult waitlist additions listed with an alcohol-related liver disease, there was a larger proportion of transplant recipients with an alcohol-related liver disease post-policy compared to pre-policy.

**Figure 28. Adult Deceased Donor Liver-Alone Transplants by Diagnosis and Era**



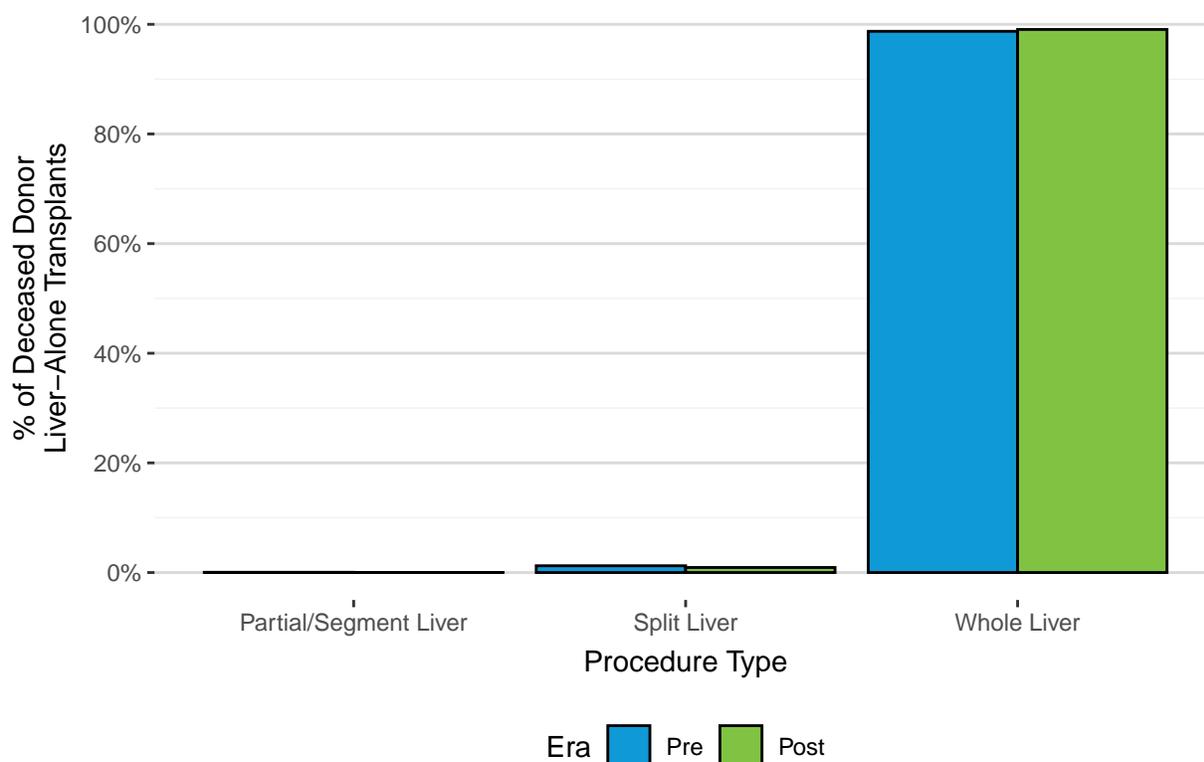
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 24. Number and Percent of Adult Deceased Donor Liver-Alone Transplants by Diagnosis and Era**

Diagnosis Group	Pre-Policy	Post-Policy
Acute Hepatic Necrosis	420 (3.0%)	411 (2.8%)
Alcohol-Related Liver Disease	3813 (27.7%)	5288 (36.5%)
Benign Neoplasms	73 (0.5%)	37 (0.3%)
Biliary Atresia	36 (0.3%)	26 (0.2%)
Cholestatic Liver Disease/Cirrhosis	336 (2.4%)	356 (2.5%)
Cirrhosis	2146 (15.6%)	1941 (13.4%)
Graft Failure	288 (2.1%)	294 (2.0%)
Malignant Neoplasms	3272 (23.8%)	2544 (17.6%)
Metabolic Disease	328 (2.4%)	293 (2.0%)
NASH	2226 (16.2%)	2418 (16.7%)
Other	97 (0.7%)	85 (0.6%)
Other Specify	148 (1.1%)	179 (1.2%)
PSC/SSC	590 (4.3%)	617 (4.3%)
Total	13773 (100.0%)	14489 (100.0%)

A split liver transplant is defined as two transplants occurring from the same donor. Nearly all (99%) of adult transplant recipients received a whole liver transplant pre- and post-policy. There were 170 split liver transplants pre-policy and 133 post-policy.

**Figure 29. Adult Deceased Donor Liver-Alone Transplants by Procedure Type and Era**



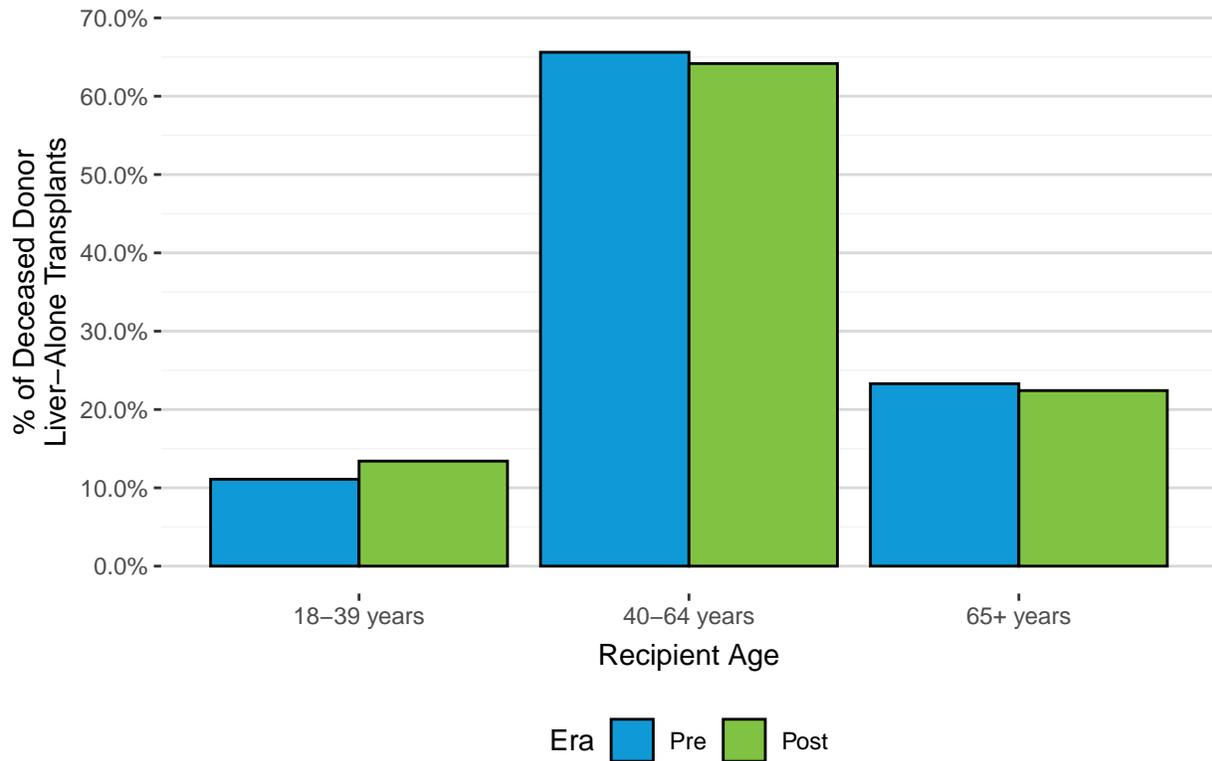
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 25. Number and Percent of Adult Deceased Donor Liver-Alone Transplants by Procedure Type and Era**

Procedure Type	Pre-Policy	Post-Policy
Partial/Segment Liver	6 (0.0%)	3 (0.0%)
Split Liver	170 (1.2%)	133 (0.9%)
Whole Liver	13597 (98.7%)	14353 (99.1%)
Total	13773 (100.0%)	14489 (100.0%)

Age distributions remained relatively constant between policy eras.

**Figure 30. Adult Deceased Donor Liver-Alone Transplants by Recipient Age and Era**



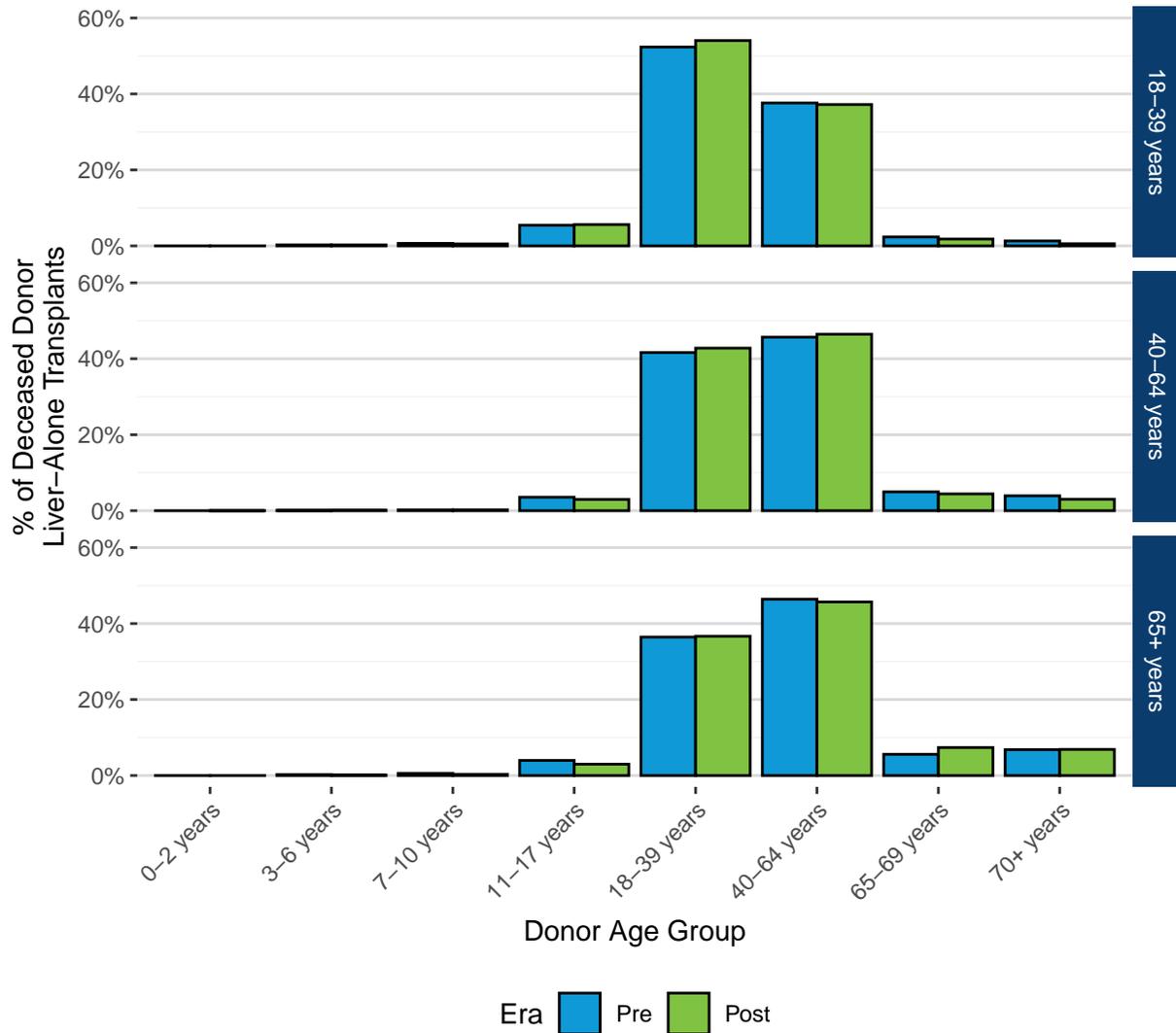
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 26. Number and Percent of Adult Deceased Donor Liver-Alone Transplants by Recipient Age and Era**

Recipient Age	Pre-Policy	Post-Policy
18-39 years	1528 (11.1%)	1943 (13.4%)
40-64 years	9037 (65.6%)	9298 (64.2%)
65+ years	3208 (23.3%)	3248 (22.4%)
Total	13773 (100.0%)	14489 (100.0%)

The donor age distributions of adult deceased donor liver-alone transplants remained fairly similar pre- to post-policy. Rarely did an adult transplant recipient receive a liver from a pediatric donor.

**Figure 31. Adult Deceased Donor Liver-Alone Transplants by Recipient Age, Donor Age, and Era**



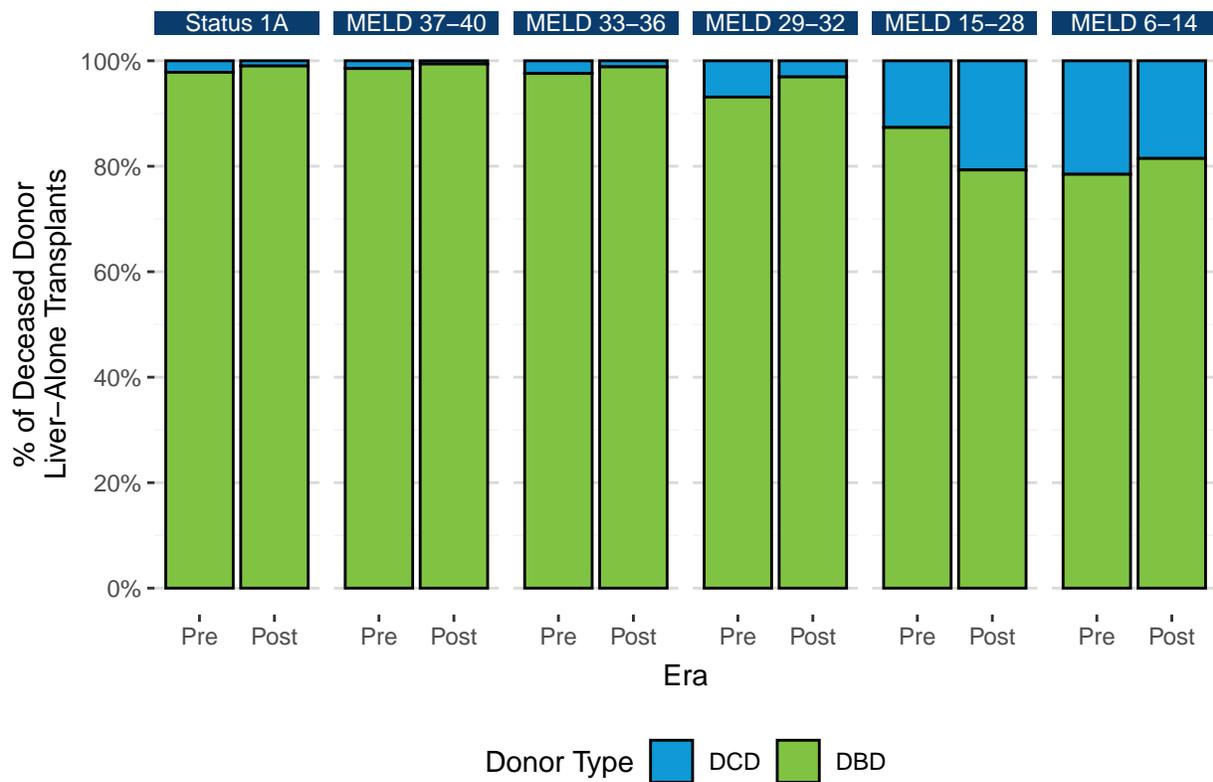
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 27. Number and Percent of Adult Deceased Donor Liver-Alone Transplants by Recipient Age, Donor Age, and Era**

Recipient Age	Donor Age	Pre-Policy	Post-Policy
18-39 years	0-2 years	0 (0.0%)	0 (0.0%)
	3-6 years	4 (0.3%)	5 (0.3%)
	7-10 years	10 (0.7%)	10 (0.5%)
	11-17 years	83 (5.4%)	109 (5.6%)
	18-39 years	800 (52.4%)	1050 (54.0%)
	40-64 years	575 (37.6%)	723 (37.2%)
	65-69 years	36 (2.4%)	35 (1.8%)
	70+ years	20 (1.3%)	11 (0.6%)
	Total	1528 (100.0%)	1943 (100.0%)
40-64 years	0-2 years	0 (0.0%)	1 (0.0%)
	3-6 years	8 (0.1%)	12 (0.1%)
	7-10 years	20 (0.2%)	22 (0.2%)
	11-17 years	321 (3.6%)	275 (3.0%)
	18-39 years	3761 (41.6%)	3979 (42.8%)
	40-64 years	4127 (45.7%)	4318 (46.4%)
	65-69 years	447 (4.9%)	410 (4.4%)
	70+ years	353 (3.9%)	281 (3.0%)
	Total	9037 (100.0%)	9298 (100.0%)
65+ years	0-2 years	0 (0.0%)	0 (0.0%)
	3-6 years	8 (0.2%)	4 (0.1%)
	7-10 years	18 (0.6%)	10 (0.3%)
	11-17 years	127 (4.0%)	97 (3.0%)
	18-39 years	1169 (36.4%)	1191 (36.7%)
	40-64 years	1489 (46.4%)	1484 (45.7%)
	65-69 years	179 (5.6%)	239 (7.4%)
	70+ years	218 (6.8%)	223 (6.9%)
	Total	3208 (100.0%)	3248 (100.0%)

There were 1,178 DCD transplants pre-policy and 1,585 DCD transplants post-policy. The majority of DCD transplants occurred for recipients with MELD scores of 28 or lower.

**Figure 32. Adult Deceased Donor Liver-Alone Transplants by Allocation MELD Score or Status, Donor Type, and Era**



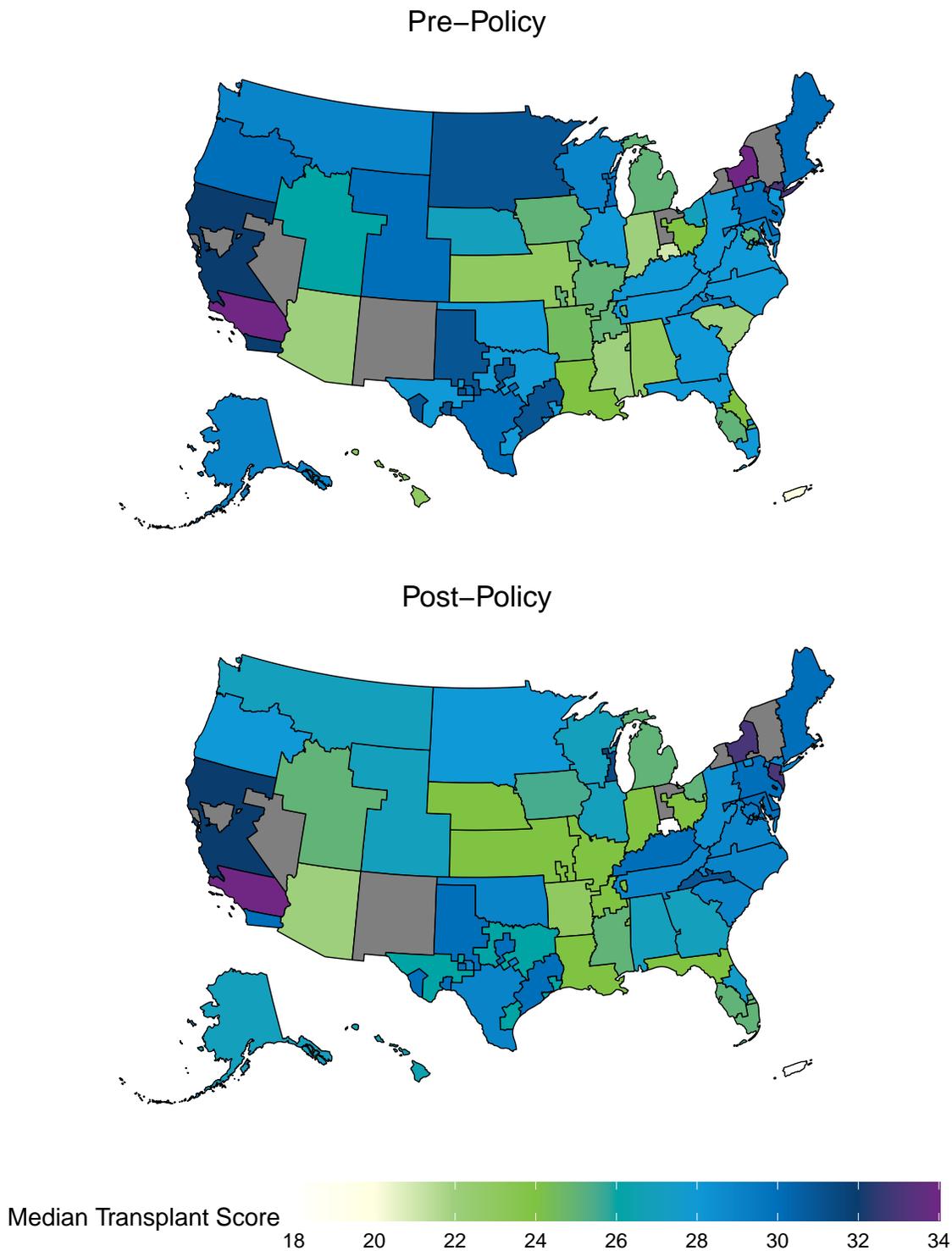
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 28. Number and Percent of Adult Deceased Donor Liver-Alone Transplants by Allocation MELD Score or Status, Donor Type, and Era**

Score or Status Group	Donor Type	Pre-Policy	Post-Policy
Status 1A	DCD	9 (2.2%)	4 (1.0%)
	DBD	403 (97.8%)	398 (99.0%)
	Total	412 (100.0%)	402 (100.0%)
MELD 37-40	DCD	32 (1.5%)	15 (0.6%)
	DBD	2150 (98.5%)	2426 (99.4%)
	Total	2182 (100.0%)	2441 (100.0%)
MELD 33-36	DCD	38 (2.4%)	20 (1.2%)
	DBD	1543 (97.6%)	1712 (98.8%)
	Total	1581 (100.0%)	1732 (100.0%)
MELD 29-32	DCD	175 (6.9%)	86 (3.1%)
	DBD	2367 (93.1%)	2717 (96.9%)
	Total	2542 (100.0%)	2803 (100.0%)
MELD 15-28	DCD	848 (12.7%)	1352 (20.7%)
	DBD	5855 (87.3%)	5176 (79.3%)
	Total	6703 (100.0%)	6528 (100.0%)
MELD 6-14	DCD	76 (21.5%)	108 (18.5%)
	DBD	277 (78.5%)	475 (81.5%)
	Total	353 (100.0%)	583 (100.0%)

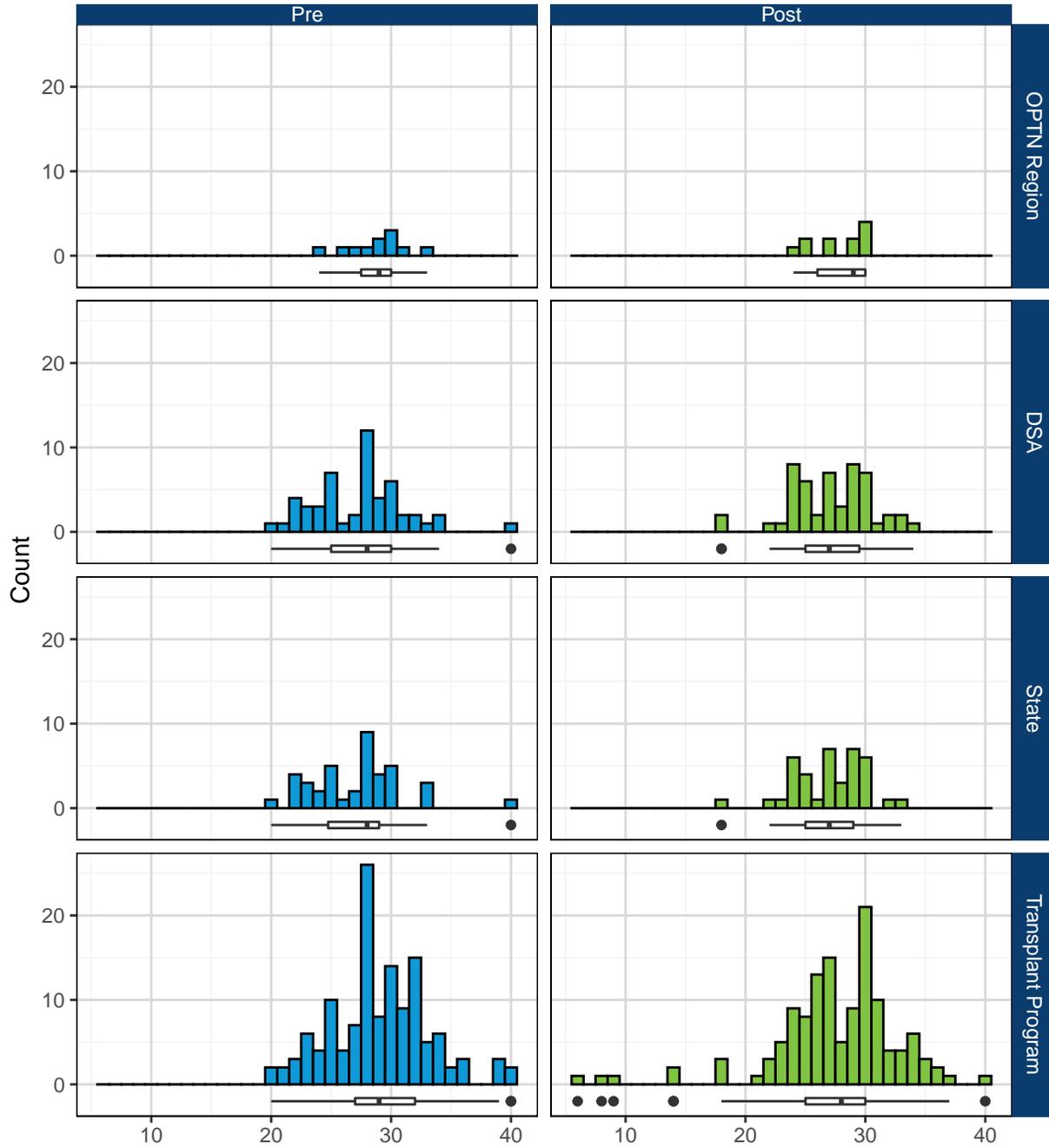
The range of median transplant scores (MTS) by DSA was 20 to 40 in the pre-policy era and 18 to 34 in the post-policy era. The national MTS was 28 pre- and 28 post-policy.

**Figure 33. Median Adult Deceased Donor Liver-Alone Recipient Allocation MELD Score at Transplant by DSA of Transplant Center and Era**



The following figure illustrates how the variance in MTS, or the spread around the average MTS across geographic units, has changed pre- to post-policy. Depending on what geographic unit (OPTN region, DSA, state, or transplant program) is used, the shape of the MTS distribution is different. However, within geographic unit, the MTS distributions remained relatively similar pre- and post-policy.

**Figure 34. Distribution of Median Adult Deceased Donor Liver-Alone Recipient Allocation MELD Score at Transplant by Geographic Units and Era**



**Median MELD at Transplant**

National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 29. Distribution of Median Adult Deceased Donor Liver-Along Recipient Allocation MELD Score at Transplant by Geographic Units and Era**

Unit of Median Transplant Score	Era	N	Median Transplant Score (MTS)					
			Minimum	25th Percentile	Median	Mean	75th Percentile	Maximum
OPTN Region	Pre	11	24	27.500	29.0	28.8	30.0	33
	Post	11	24	26.000	29.0	27.8	30.0	30
DSA	Pre	52	20	24.875	28.0	27.4	30.0	40
	Post	51	18	25.000	27.0	27.1	29.3	34
State	Pre	40	20	24.375	28.0	27.2	29.0	40
	Post	39	18	25.000	27.0	27.0	29.0	33
Transplant Program	Pre	131	20	27.000	29.0	29.0	32.0	40
	Post	128	6	25.000	27.5	27.5	30.0	40

It was also important to quantify the variation in median allocation MELD at transplant between different units. Changes in variance decreased post-policy by OPTN region, DSA, and state. Variance between transplant programs increased.

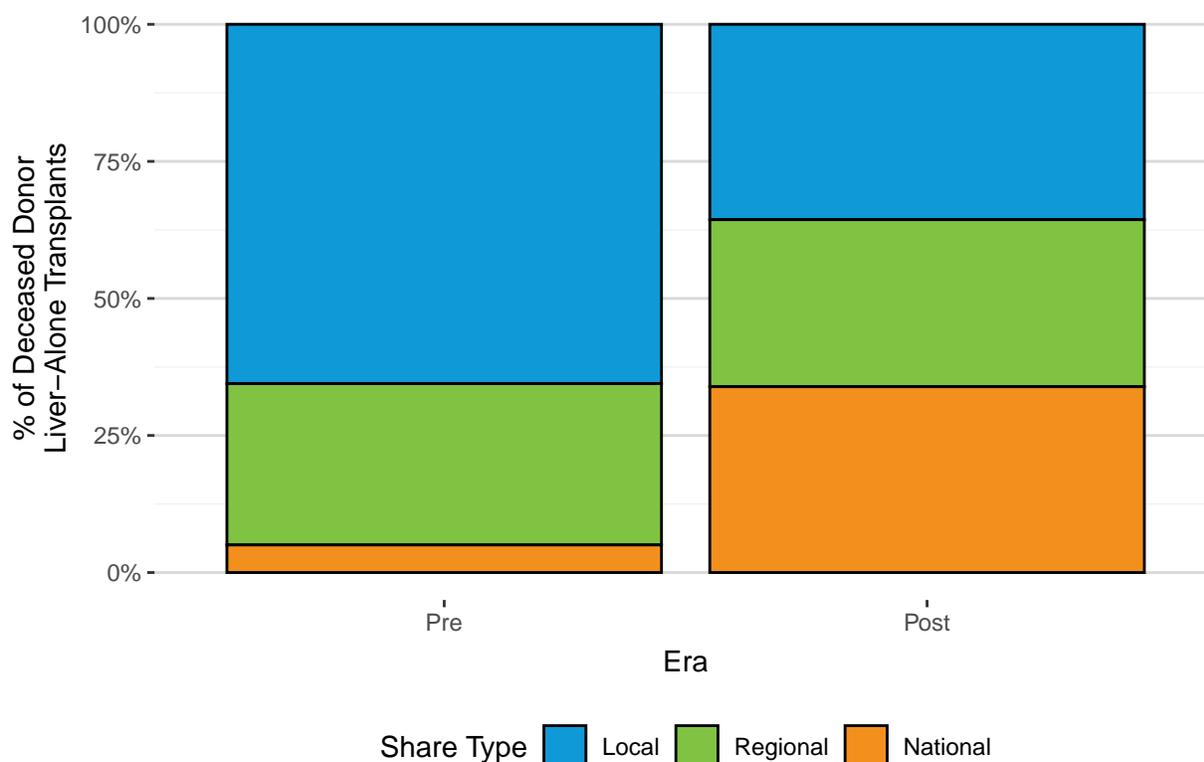
**Table 30. Variance and Standard Deviation of Median Adult Deceased Donor Liver-Along Recipient Allocation MELD Score at Transplant By Era**

Unit of Median Transplant Score	Pre-Policy		Post-Policy	
	Variance	(SD)	Variance	(SD)
OPTN Region	6.16	2.48	5.36	2.32
DSA	14.72	3.84	11.54	3.40
State	14.84	3.85	8.89	2.98
Transplant Center	16.62	4.08	27.61	5.25

Overall pre- versus post-policy comparisons show that there were no statistically significant differences in variance at this time (OPTN Region  $\chi^2_1=0.01$ ,  $p=0.924$ , DSA  $\chi^2_1=0.34$ ,  $p=0.560$ , state  $\chi^2_1=1.12$ ,  $p=0.290$ , transplant program  $\chi^2_1=1.24$ ,  $p=0.265$ ).

While just under two-thirds of liver transplants were local (transplant center within same DSA as donor hospital) in the pre-policy era, this dropped to a little over one-third during the post-policy era. There were fairly equal percentages of liver transplants in the local, regional, and national share types in the post-policy era.

**Figure 35. Adult Deceased Donor Liver-Alone Transplants by Donor Share Type and Era**



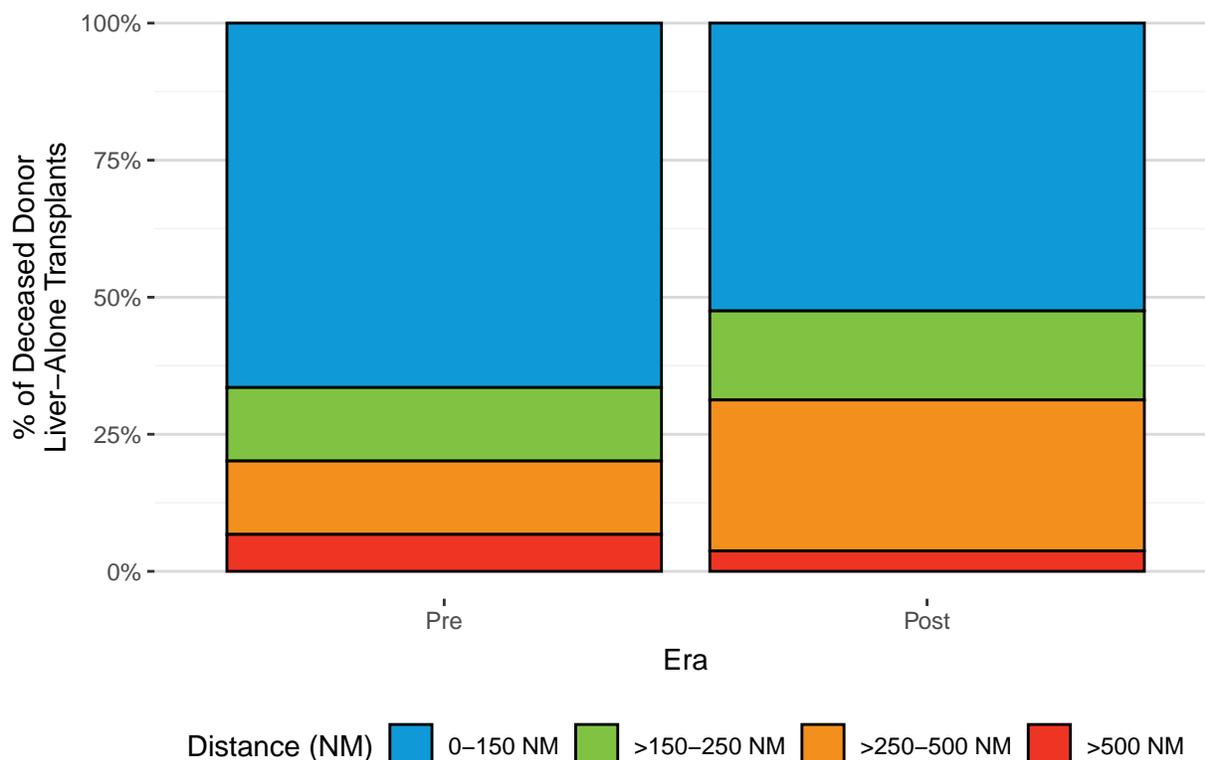
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 31. Number and Percent of Adult Deceased Donor Liver-Alone Transplants by Donor Share Type and Era**

Donor Share Type	Pre-Policy	Post-Policy
Local	9028 (65.5%)	5163 (35.6%)
Regional	4052 (29.4%)	4415 (30.5%)
National	693 (5.0%)	4911 (33.9%)
Total	13773 (100.0%)	14489 (100.0%)

Since this policy removed DSA and OPTN region as units of allocation and now uses circles around the donor hospital of the potential liver donor, the distance that deceased donor livers travel has been of interest. Based on information that is reported to the OPTN, this is defined as the straight-line nautical mile (NM) distance between donor hospital and transplant center. Unlike statute (regular) miles, NM do take into account some curvature of the earth. There was a decrease in liver transplants occurring within 150 NM of the donor hospital post-policy. There was a subsequent increase in liver transplants occurring over 150 NM but within 500 NM of the donor hospital, corresponding to the >150-250 NM and >250-500 NM classifications.

**Figure 36. Adult Deceased Donor Liver-Alone Transplants by Classification Distance and Era**



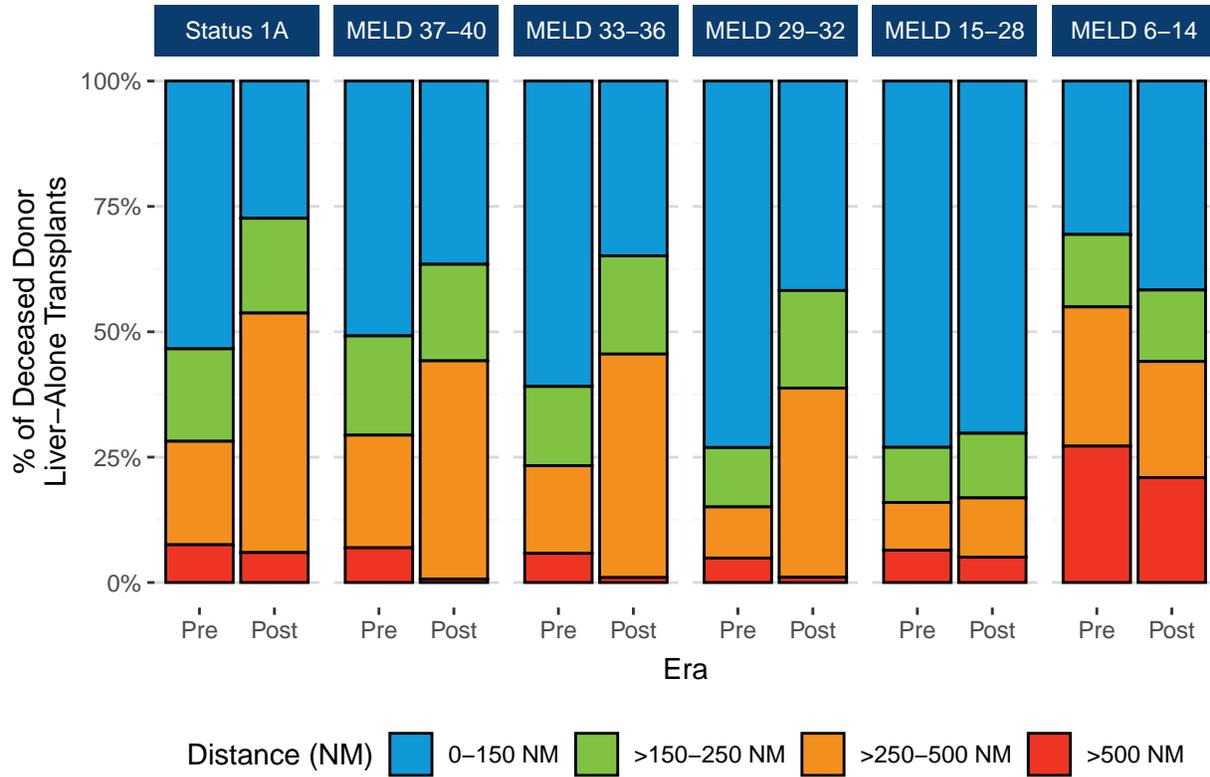
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 32. Number and Percent of Adult Deceased Donor Liver-Alone Transplants by Classification Distance and Era**

Classification Distance	Pre-Policy	Post-Policy
0-150 NM	9155 (66.5%)	7606 (52.5%)
>150-250 NM	1846 (13.4%)	2354 (16.2%)
>250-500 NM	1845 (13.4%)	3991 (27.5%)
>500 NM	927 (6.7%)	538 (3.7%)
Total	13773 (100.0%)	14489 (100.0%)

There has been a substantial change in the distribution of distance between donor hospital and transplant program in all post-policy periods by score group. Notably in the post-policy eras, the higher allocation score and Status 1A groups have larger proportions of livers coming from >250-500 NM, while the distribution of distance for recipients with MELD scores of 15-28 and 6-14 remained similar to pre-policy distributions.

**Figure 37. Adult Deceased Donor Liver-Alone Transplants by Allocation MELD Score or Status, Classification Distance, and Era**



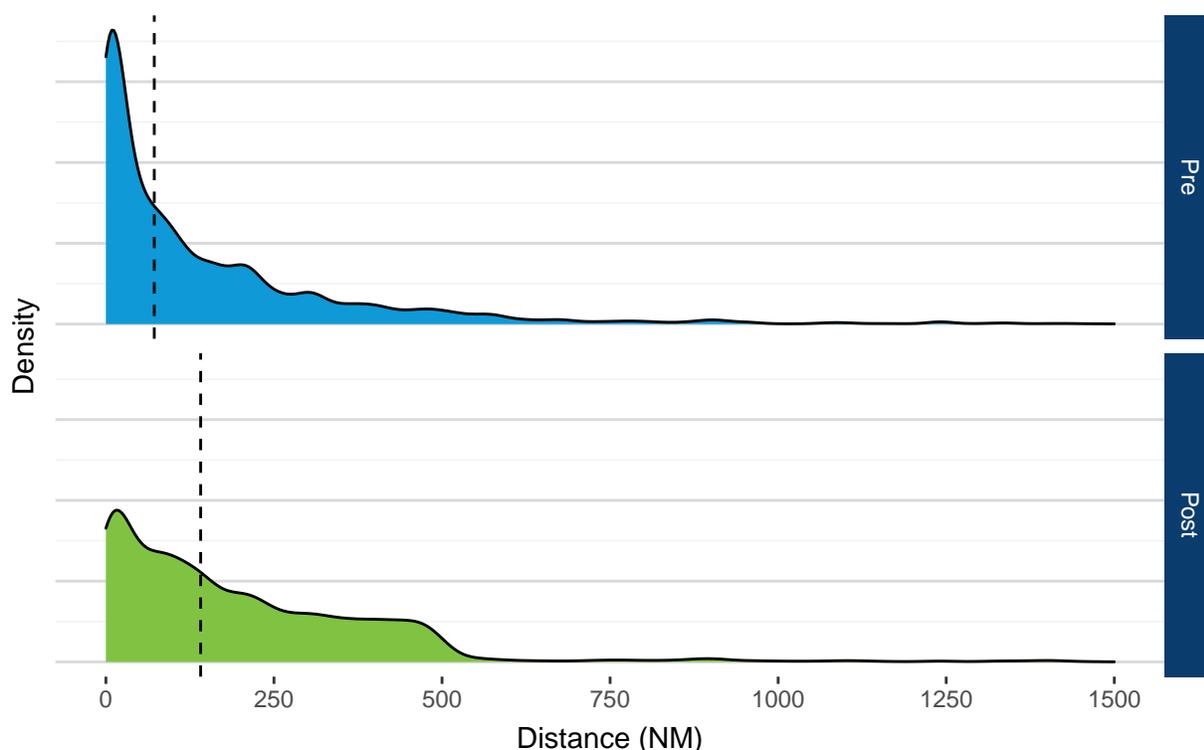
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 33. Number and Percent of Adult Deceased Donor Liver-Alone Transplants by Allocation MELD Score or Status, Classification Distance, and Era**

Score or Status Group	Classification Distance	Pre-Policy	Post-Policy
Status 1A	0-150 NM	220 (53.4%)	110 (27.4%)
	>150-250 NM	76 (18.4%)	76 (18.9%)
	>250-500 NM	85 (20.6%)	192 (47.8%)
	>500 NM	31 (7.5%)	24 (6.0%)
	Total	412 (100.0%)	402 (100.0%)
MELD 37-40	0-150 NM	1109 (50.8%)	892 (36.5%)
	>150-250 NM	432 (19.8%)	470 (19.3%)
	>250-500 NM	490 (22.5%)	1063 (43.5%)
	>500 NM	151 (6.9%)	16 (0.7%)
	Total	2182 (100.0%)	2441 (100.0%)
MELD 33-36	0-150 NM	963 (60.9%)	604 (34.9%)
	>150-250 NM	250 (15.8%)	339 (19.6%)
	>250-500 NM	276 (17.5%)	772 (44.6%)
	>500 NM	92 (5.8%)	17 (1.0%)
	Total	1581 (100.0%)	1732 (100.0%)
MELD 29-32	0-150 NM	1858 (73.1%)	1171 (41.8%)
	>150-250 NM	301 (11.8%)	545 (19.4%)
	>250-500 NM	259 (10.2%)	1058 (37.7%)
	>500 NM	124 (4.9%)	29 (1.0%)
	Total	2542 (100.0%)	2803 (100.0%)
MELD 15-28	0-150 NM	4897 (73.1%)	4586 (70.3%)
	>150-250 NM	736 (11.0%)	841 (12.9%)
	>250-500 NM	637 (9.5%)	771 (11.8%)
	>500 NM	433 (6.5%)	330 (5.1%)
	Total	6703 (100.0%)	6528 (100.0%)
MELD 6-14	0-150 NM	108 (30.6%)	243 (41.7%)
	>150-250 NM	51 (14.4%)	83 (14.2%)
	>250-500 NM	98 (27.8%)	135 (23.2%)
	>500 NM	96 (27.2%)	122 (20.9%)
	Total	353 (100.0%)	583 (100.0%)

The median distance from donor hospital to transplant program increased from 72 NM to 141 NM post-policy. Overall, there was a greater proportion of livers coming from 250 to 500 NM post-policy compared to pre-policy.

**Figure 38. Distribution of Distance from Donor Hospital to Transplant Program for Adult Deceased Donor Liver-Alone Transplants by Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

\*\* Dotted lines indicate median distance within each era.

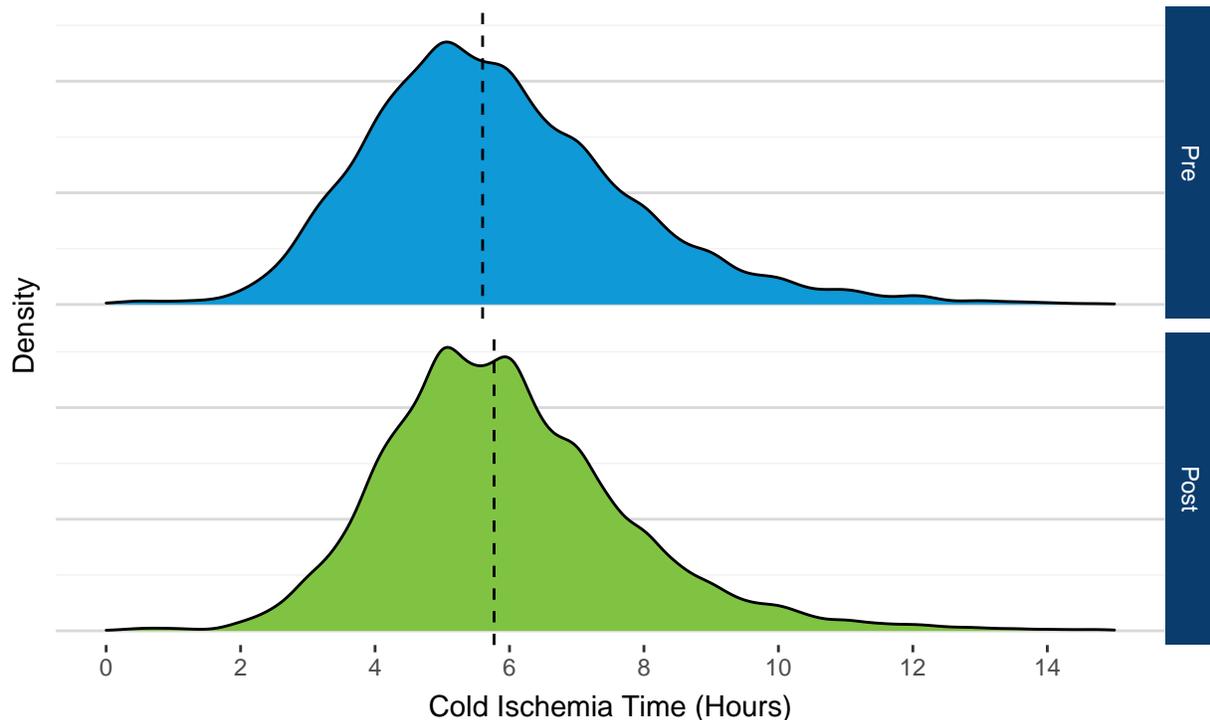
\*\*\* There were 32 pre-policy and 31 post-policy transplants with distance >1500 NM not included.

**Table 34. Summary of Distance from Donor Hospital to Transplant Program for Adult Deceased Donor Liver-Alone Transplants by Era**

Era	N	N Missing	Distance (NM)					
			Minimum	25th Percentile	Median	Mean	75th Percentile	Maximum
Pre	13773	0	0	11	72	154.92	207	2529
Post	14489	0	0	46	141	199.79	305	2529

Despite distance increasing, the change in median cold ischemia time increased by roughly 10 minutes post-policy compared to pre-policy. Distributions in cold ischemia time remained similar pre- and post-policy.

**Figure 39. Distribution of Cold Ischemia Time for Adult Deceased Donor Liver-Alone Transplants by Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

\*\* Dotted lines indicate median cold ischemia time within each era.

\*\*\* There were 46 pre-policy and 114 post-policy transplant recipients with missing cold ischemia time that are not included.

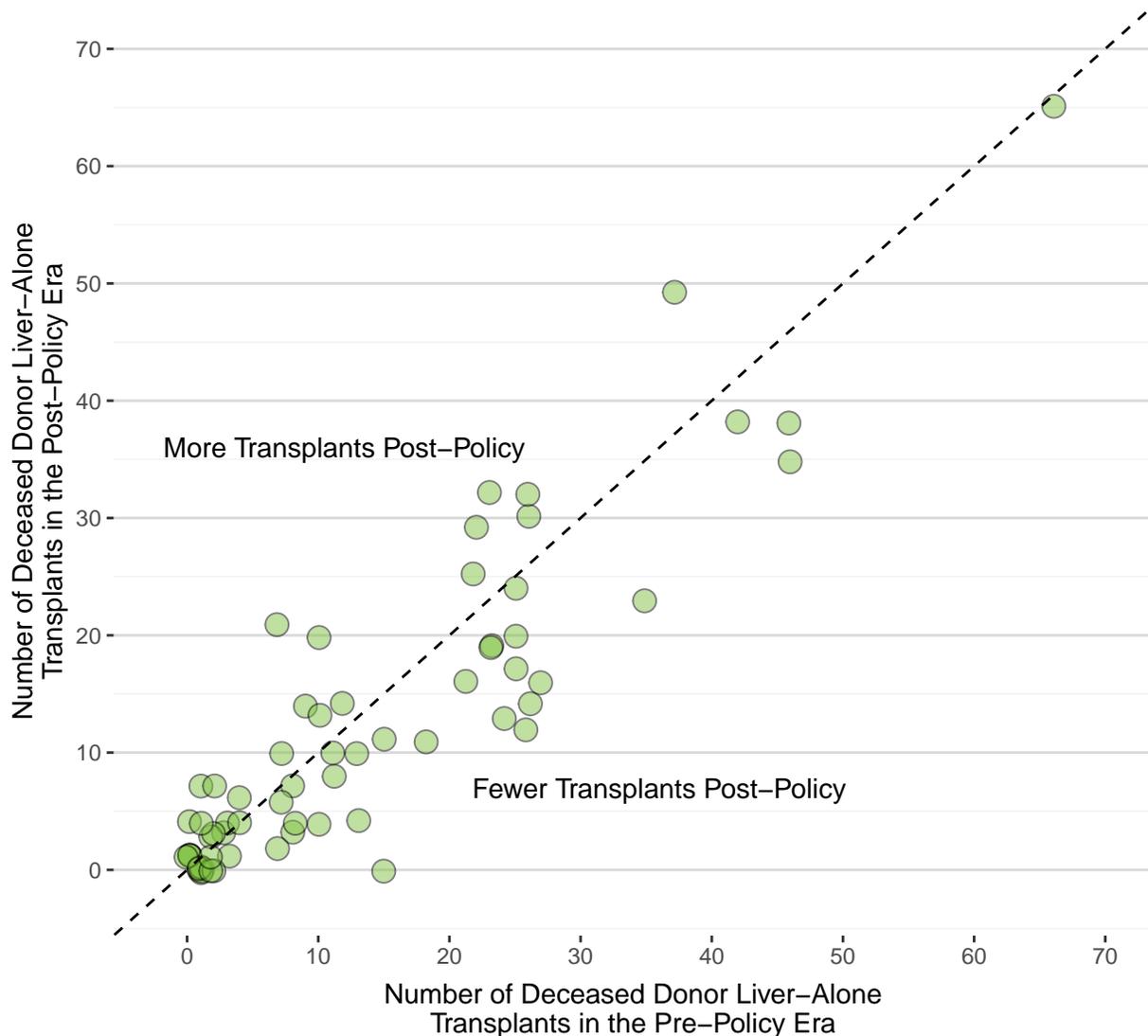
^ There were 27 pre-policy and 58 post-policy transplants with cold ischemia time >15 hours not included.

**Table 35. Distribution of Cold Ischemia Time for Adult Deceased Donor Liver-Alone Transplants by Era**

Era	N	N Missing	Time (hours)					
			Minimum	25th Percentile	Median	Mean	75th Percentile	Maximum
Pre	13727	46	0	4.50	5.60	5.86	7	38
Post	14375	114	0	4.74	5.77	6.00	7	43

### Pediatric Liver-Along Transplants

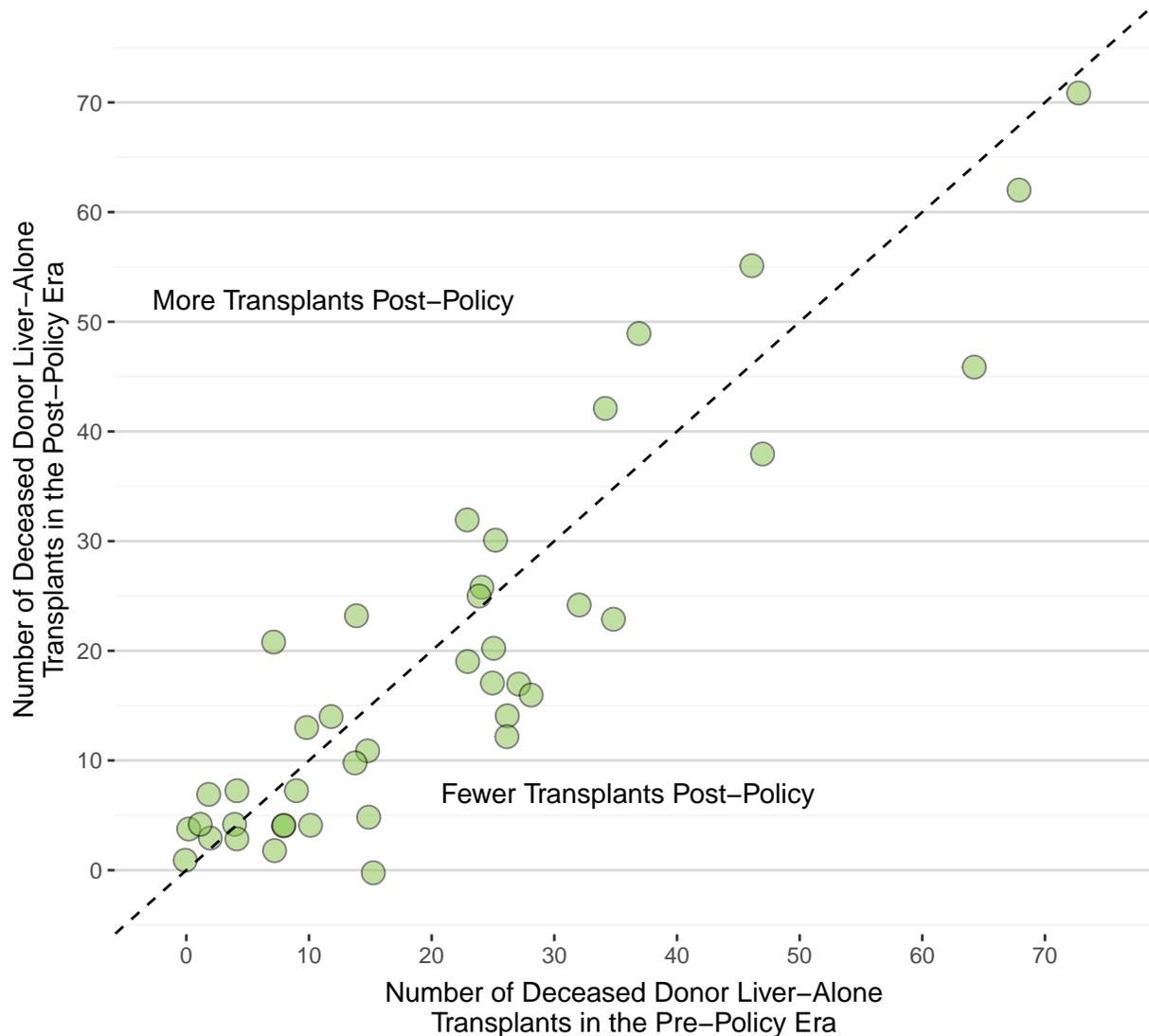
Figure 40. Pediatric Deceased Donor Liver-Along Transplants by Transplant Program and Era



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

Any points along the diagonal dashed line indicate no changes in the absolute number of pediatric deceased donor liver-alone transplants by program, pre- to post-policy. Points that fall above the diagonal represent programs that performed more deceased donor liver transplants post-policy compared to pre-policy. Points that fall below the diagonal represent programs that performed fewer deceased donor liver transplants post-policy compared to pre-policy. A table of pediatric deceased donor liver-alone transplants by transplant program and era can be found in the **Appendix**.

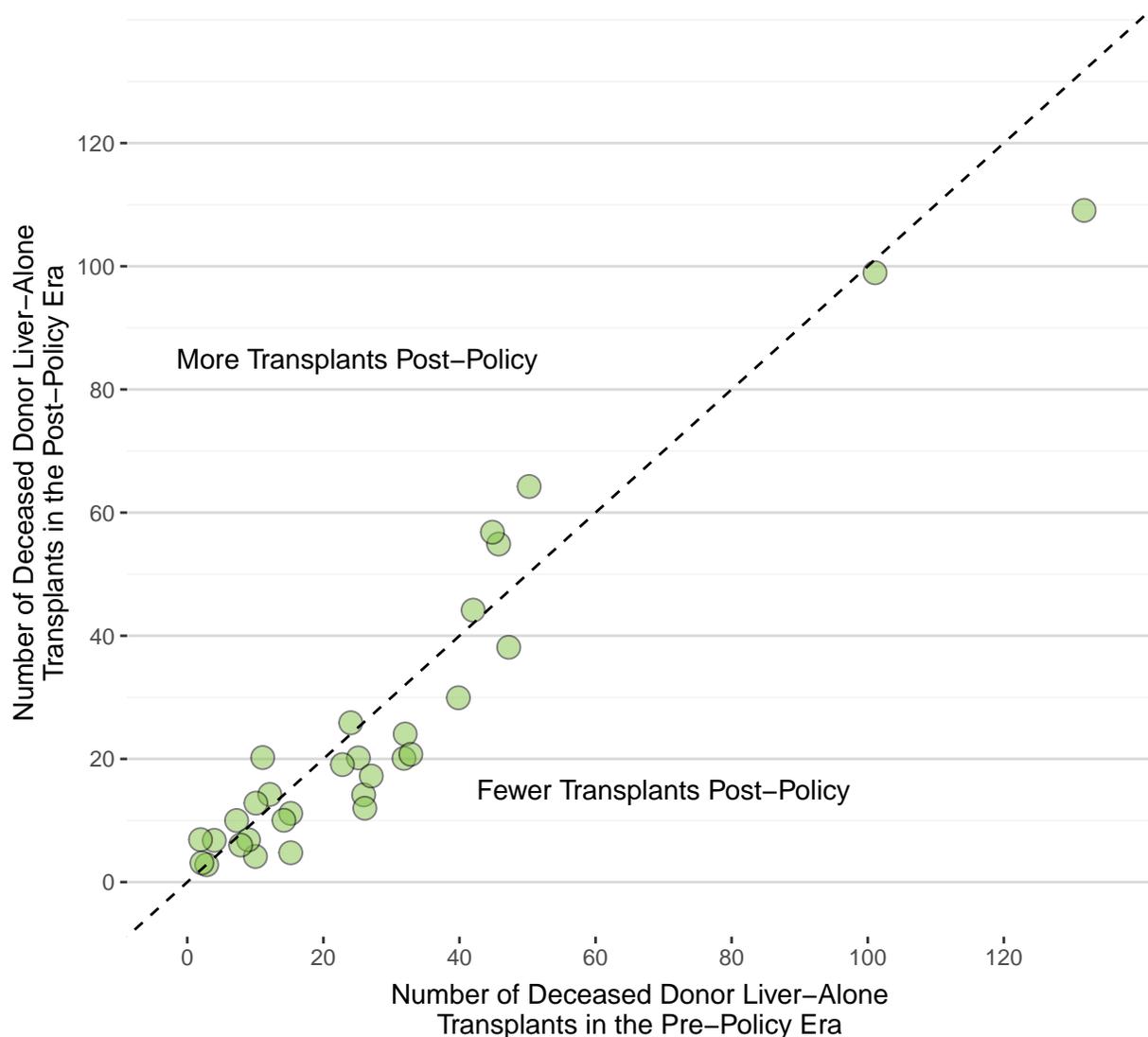
The majority of programs performed similar number of deceased donor liver transplants pre-policy and post-policy. A Spearman's rank correlation of  $\rho = 0.852$  indicates a strong positive, monotonic relationship between these two measures. The Kruskal-Wallis test indicated that there was not a statistically significant change pre- to post-policy in the number of deceased donor, liver-alone transplants performed per transplant program ( $\chi^2_1 = 0.0283$ ,  $p = 0.866$ ).

**Figure 41. Pediatric Deceased Donor Liver-Alone Transplants by Transplant Program DSA and Era**

National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

Any points along the diagonal dashed line indicate no changes in the absolute number of pediatric deceased donor liver-alone transplants by DSA, pre- to post-policy. Points that fall above the diagonal represent DSAs that performed more deceased donor liver transplants post-policy compared to pre-policy. Points that fall below the diagonal represent DSAs that performed fewer deceased donor liver transplants post-policy compared to pre-policy. A table of pediatric deceased donor liver-alone transplants by transplant program DSA and era can be found in the **Appendix**.

The majority of DSAs performed similar number of deceased donor liver transplants pre- and post-policy. A Spearman's rank correlation of  $\rho = 0.829$  indicates a strong positive, monotonic relationship between these two measures. The Kruskal-Wallis test indicated that there was not a statistically significant change pre- to post-policy in the number of deceased donor, liver-alone transplants performed within each DSA ( $\chi^2=0.9352$ ,  $p=0.334$ ).

**Figure 42. Pediatric Deceased Donor Liver-Alone Transplants by Transplant Program State and Era**

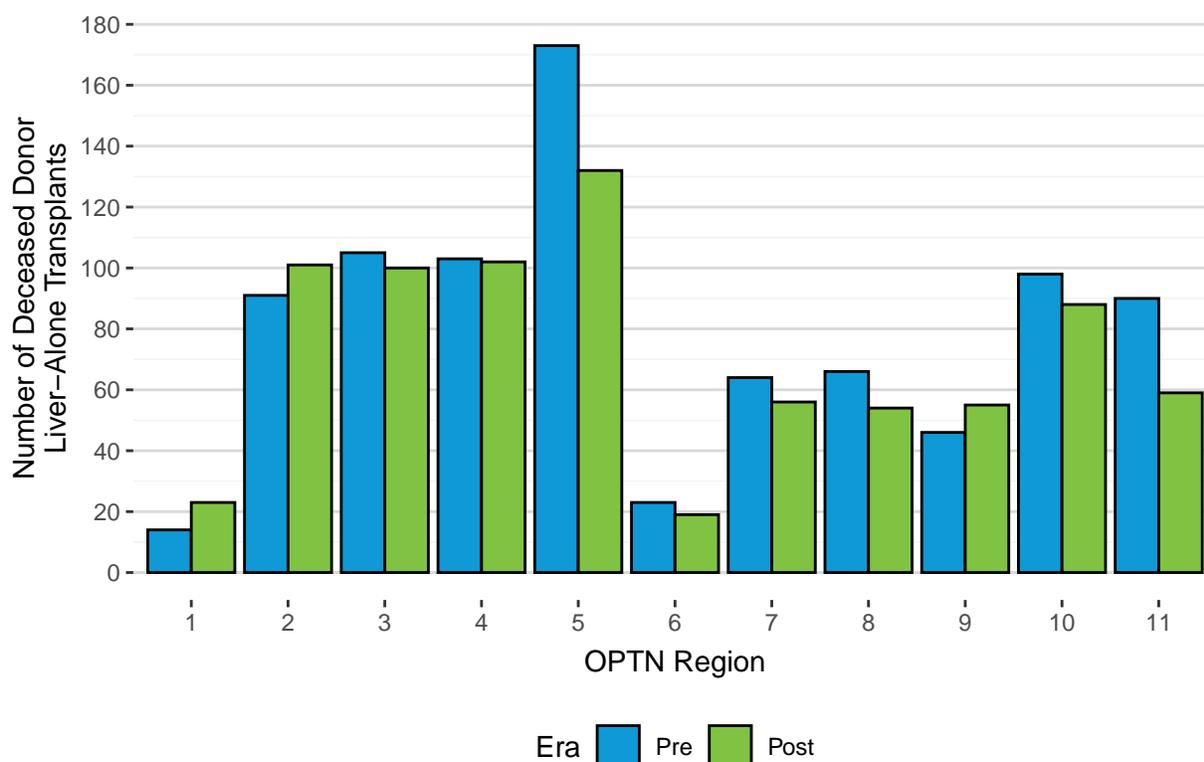
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

Any points along the diagonal dashed line indicate no changes in the absolute number of pediatric deceased donor liver-alone transplants by state, pre- to post-policy. Points that fall above the diagonal represent states that performed more deceased donor liver transplants post-policy compared to pre-policy. Points that fall below the diagonal represent states that performed fewer deceased donor liver transplants post-policy compared to pre-policy. A table of pediatric deceased donor liver-alone transplants by transplant program state and era can be found in the **Appendix**.

The majority of programs performed similar number of deceased donor liver transplants pre- and post-policy. A Spearman's rank correlation of  $\rho = 0.906$  indicates a strong positive, monotonic relationship between these two measures. The Kruskal-Wallis test indicated that there was not a statistically significant change pre- to post-policy in the number of deceased donor, liver-alone transplants performed within each state ( $\chi^2_1 = 0.4764$ ,  $p = 0.49$ ).

Overall, there were 873 pediatric deceased donor liver-alone transplants pre-policy and 789 post-policy. Regions 1, 2, and 9 experienced an increase in transplant volume and Regions 3, 4, 5, 6, 7, 8, 10, and 11 experienced a decrease.

**Figure 43. Pediatric Deceased Donor Liver-Alone Transplants by OPTN Region and Era**



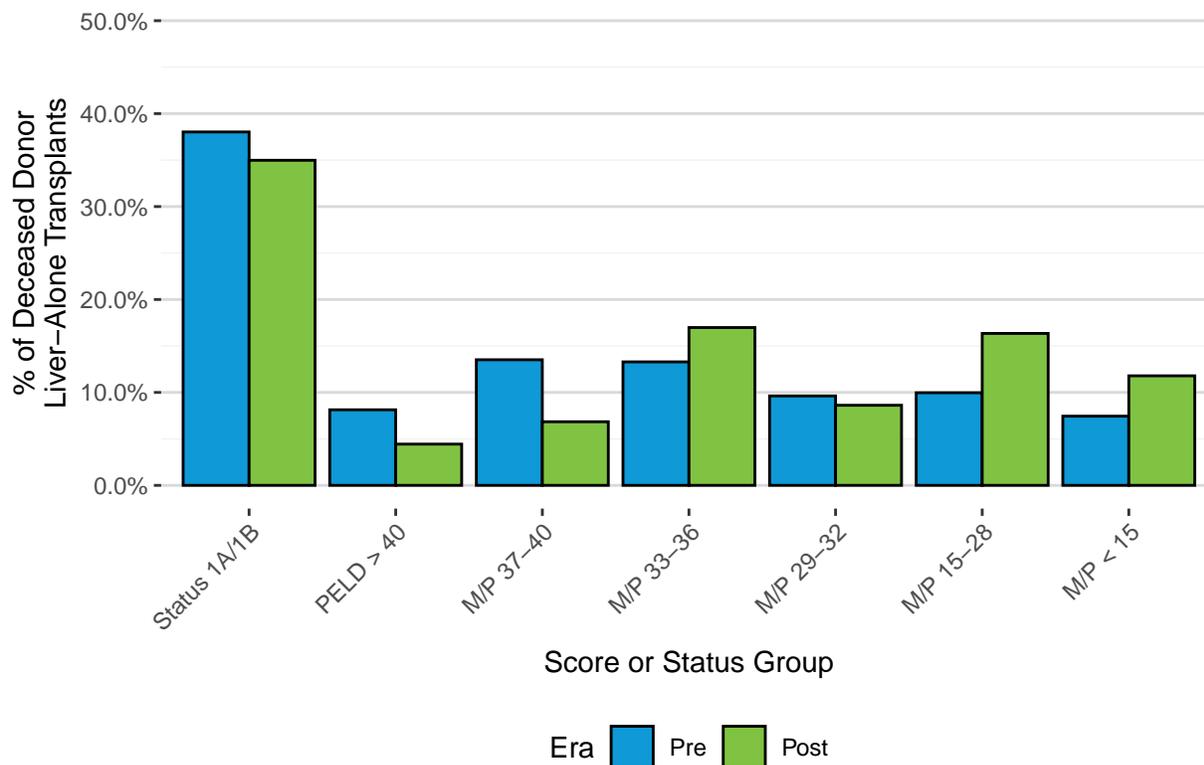
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 36. Number and Percent of Pediatric Deceased Donor Liver-Alone Transplants by OPTN Region and Era**

OPTN Region	Pre-Policy	Post-Policy
1	14 (1.6%)	23 (2.9%)
2	91 (10.4%)	101 (12.8%)
3	105 (12.0%)	100 (12.7%)
4	103 (11.8%)	102 (12.9%)
5	173 (19.8%)	132 (16.7%)
6	23 (2.6%)	19 (2.4%)
7	64 (7.3%)	56 (7.1%)
8	66 (7.6%)	54 (6.8%)
9	46 (5.3%)	55 (7.0%)
10	98 (11.2%)	88 (11.2%)
11	90 (10.3%)	59 (7.5%)
Total	873 (100.0%)	789 (100.0%)

There were fewer transplants in the Status 1A/1B, PELD >40, MELD/PELD 37-40, MELD/PELD 29-32 groups and a greater number of transplants in the MELD/PELD 33-36, MELD/PELD 15-28, and MELD/PELD <15 groups post-policy compared to pre-policy. The national median allocation MELD or PELD score at transplant was 35 pre-policy and 30 post-policy.

**Figure 44. Pediatric Deceased Donor Liver-Alone Transplants by Allocation MELD or PELD Score or Status and Era**



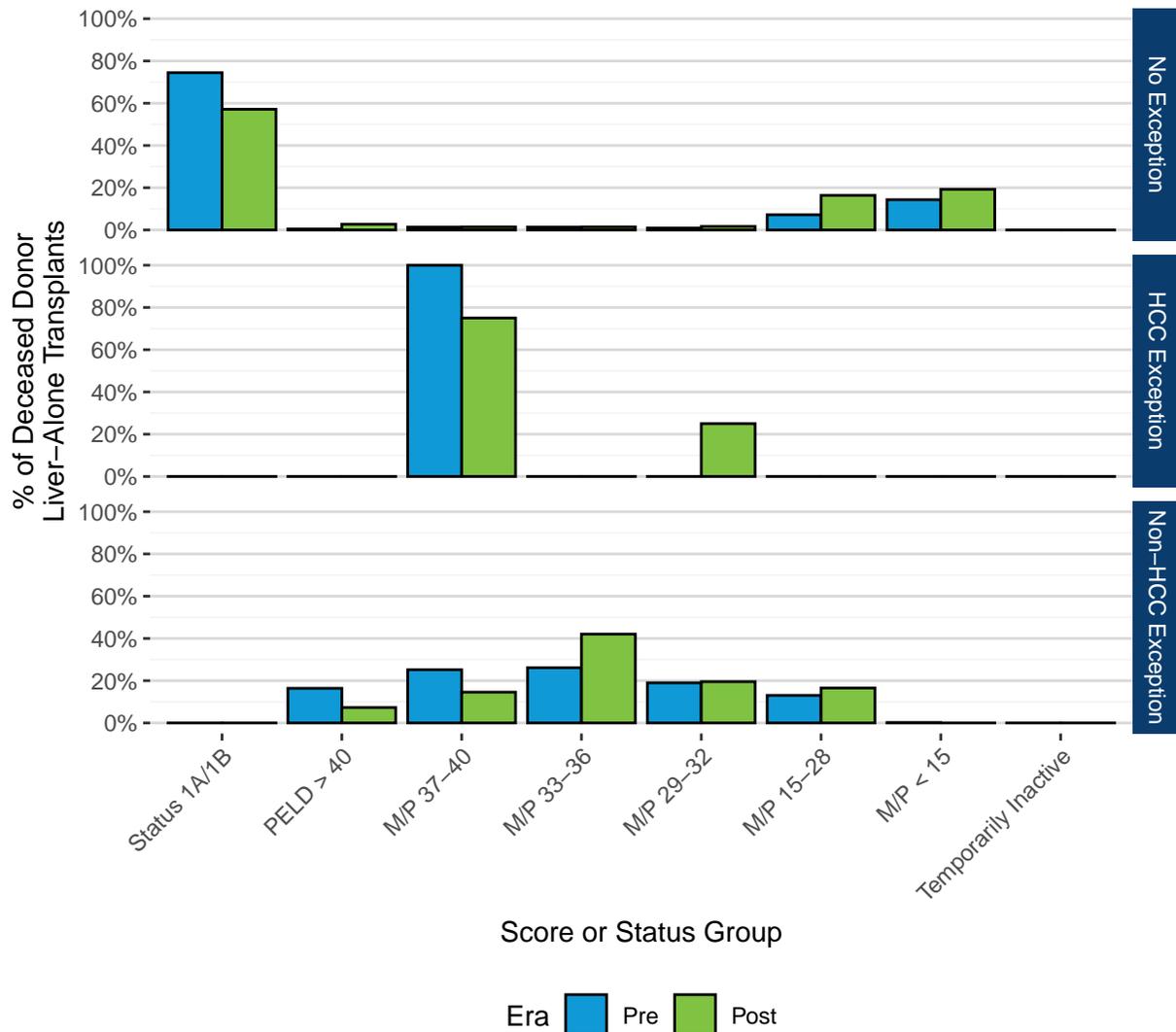
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 37. Number and Percent of Pediatric Deceased Donor Liver-Alone Transplants by Allocation MELD or PELD Score or Status and Era**

Score or Status Group	Pre-Policy	Post-Policy
Status 1A/1B	332 (38.0%)	276 (35.0%)
PELD > 40	71 (8.1%)	35 (4.4%)
M/P 37-40	118 (13.5%)	54 (6.8%)
M/P 33-36	116 (13.3%)	134 (17.0%)
M/P 29-32	84 (9.6%)	68 (8.6%)
M/P 15-28	87 (10.0%)	129 (16.3%)
M/P < 15	65 (7.4%)	93 (11.8%)
Total	873 (100.0%)	789 (100.0%)

The share of Status 1A/1B non-exception transplants decreased to a little over half (57%) post-policy from about three quarters (74%) pre-policy. The share of MELD/PELD 15-28 non-exception transplants increased post-policy. There were fewer PELD >40 and MELD/PELD 37-40 non-HCC exception transplants and a greater number of MELD/PELD 33-36 non-HCC exception transplants post-policy compared to pre-policy. There were 6 pediatric HCC exception transplants pre-policy and 4 post-policy.

**Figure 45. Pediatric Deceased Donor Liver-Alone Transplants by Allocation MELD or PELD Score or Status, Exception Status, and Era**



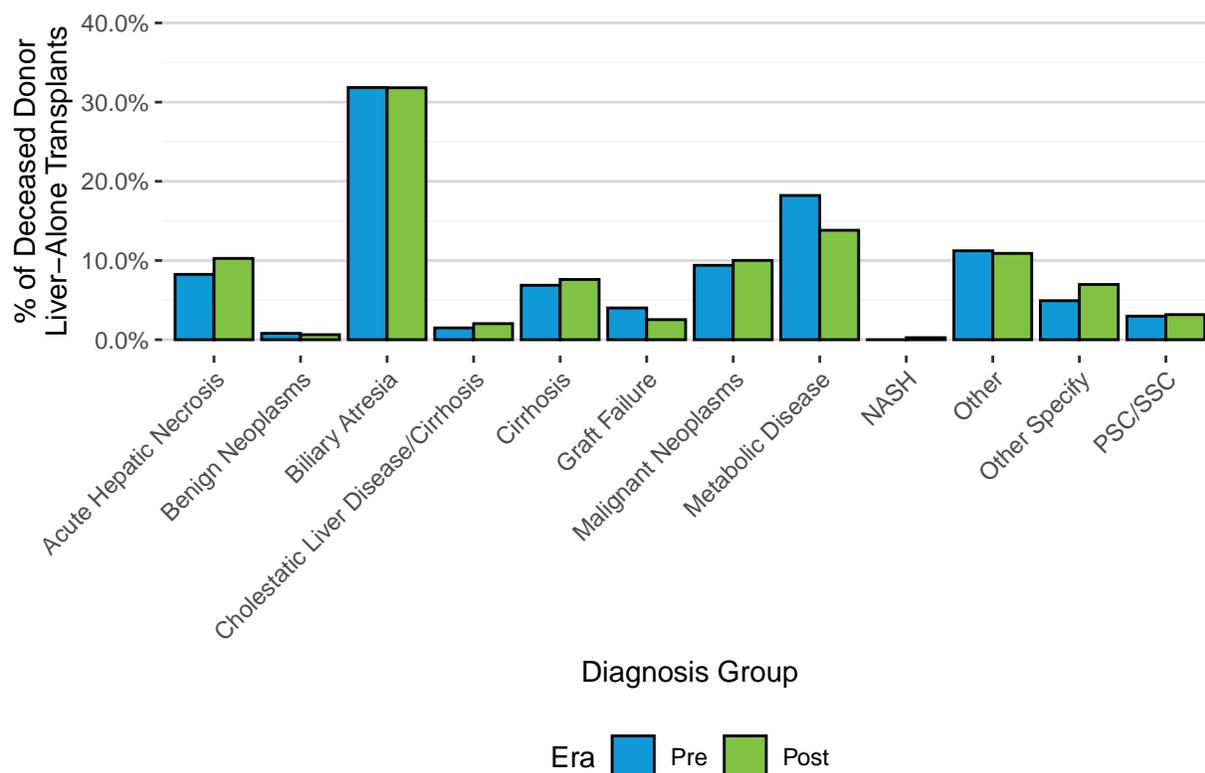
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 38. Number and Percent of Pediatric Deceased Donor Liver-Alone Transplants by Allocation MELD or PELD Score or Status, Exception Status, and Era**

Exception Type	Score or Status Group	Pre-Policy	Post-Policy
No Exception	Status 1A/1B	332 (74.4%)	276 (57.1%)
	PELD > 40	2 (0.4%)	13 (2.7%)
	M/P 37-40	6 (1.3%)	7 (1.4%)
	M/P 33-36	6 (1.3%)	7 (1.4%)
	M/P 29-32	4 (0.9%)	8 (1.7%)
	M/P 15-28	32 (7.2%)	79 (16.4%)
	M/P < 15	64 (14.3%)	93 (19.3%)
	Temporarily Inactive	0 (0.0%)	0 (0.0%)
	Total	446 (100.0%)	483 (100.0%)
HCC Exception	Status 1A/1B	0 (0.0%)	0 (0.0%)
	PELD > 40	0 (0.0%)	0 (0.0%)
	M/P 37-40	6 (100.0%)	3 (75.0%)
	M/P 33-36	0 (0.0%)	0 (0.0%)
	M/P 29-32	0 (0.0%)	1 (25.0%)
	M/P 15-28	0 (0.0%)	0 (0.0%)
	M/P < 15	0 (0.0%)	0 (0.0%)
	Temporarily Inactive	0 (0.0%)	0 (0.0%)
	Total	6 (100.0%)	4 (100.0%)
Non-HCC Exception	Status 1A/1B	0 (0.0%)	0 (0.0%)
	PELD > 40	69 (16.4%)	22 (7.3%)
	M/P 37-40	106 (25.2%)	44 (14.6%)
	M/P 33-36	110 (26.1%)	127 (42.1%)
	M/P 29-32	80 (19.0%)	59 (19.5%)
	M/P 15-28	55 (13.1%)	50 (16.6%)
	M/P < 15	1 (0.2%)	0 (0.0%)
	Temporarily Inactive	0 (0.0%)	0 (0.0%)
	Total	421 (100.0%)	302 (100.0%)

Diagnosis distributions remained similar pre- and post-policy for pediatric deceased donor liver-alone transplants.

**Figure 46. Pediatric Deceased Donor Liver-Alone Transplants by Diagnosis and Era**



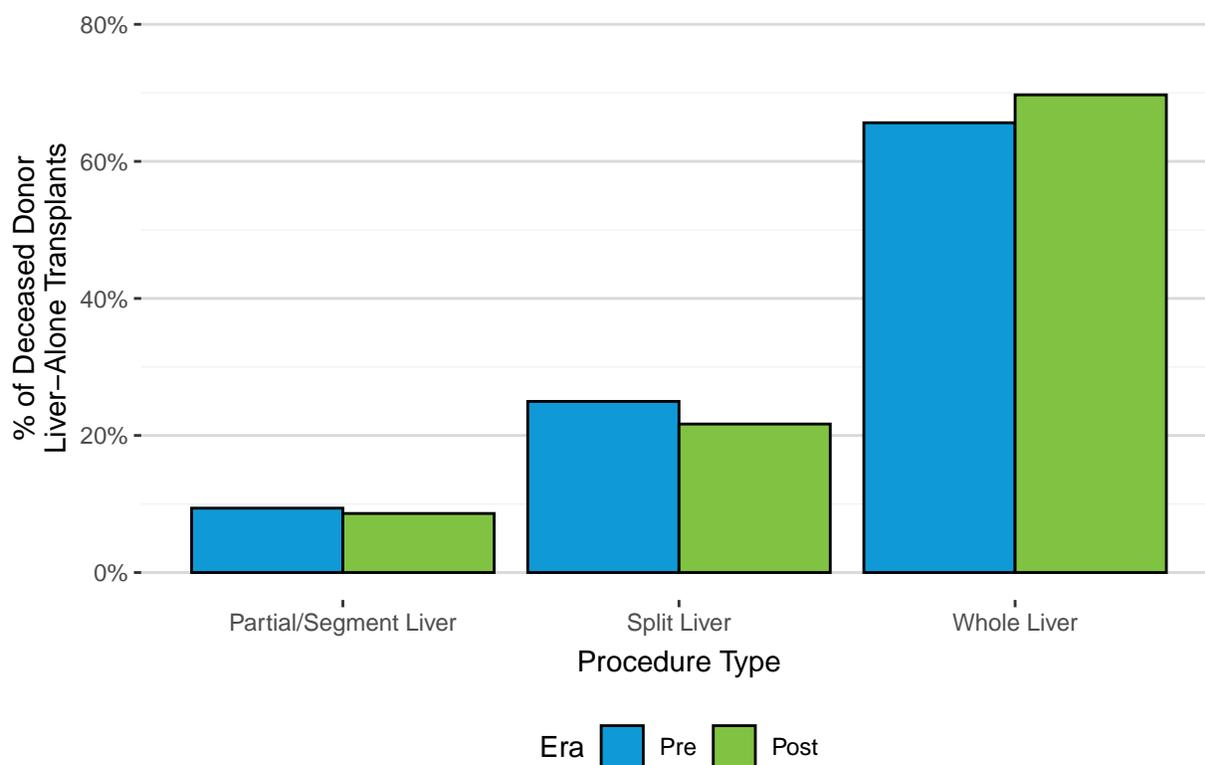
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 39. Number and Percent of Pediatric Deceased Donor Liver-Alone Transplants by Diagnosis and Era**

Diagnosis Group	Pre-Policy	Post-Policy
Acute Hepatic Necrosis	72 (8.2%)	81 (10.3%)
Benign Neoplasms	7 (0.8%)	5 (0.6%)
Biliary Atresia	278 (31.8%)	251 (31.8%)
Cholestatic Liver Disease/Cirrhosis	13 (1.5%)	16 (2.0%)
Cirrhosis	60 (6.9%)	60 (7.6%)
Graft Failure	35 (4.0%)	20 (2.5%)
Malignant Neoplasms	82 (9.4%)	79 (10.0%)
Metabolic Disease	159 (18.2%)	109 (13.8%)
NASH	0 (0.0%)	2 (0.3%)
Other	98 (11.2%)	86 (10.9%)
Other Specify	43 (4.9%)	55 (7.0%)
PSC/SSC	26 (3.0%)	25 (3.2%)
Total	873 (100.0%)	789 (100.0%)

A split liver transplant is defined as two transplants occurring from the same donor. A whole liver transplant remained the most common pediatric deceased donor procedure type. Post-policy there were 171 pediatric deceased donor split liver transplants compared to 218 pre-policy.

**Figure 47. Pediatric Deceased Donor Liver-Alone Transplants by Procedure Type and Era**



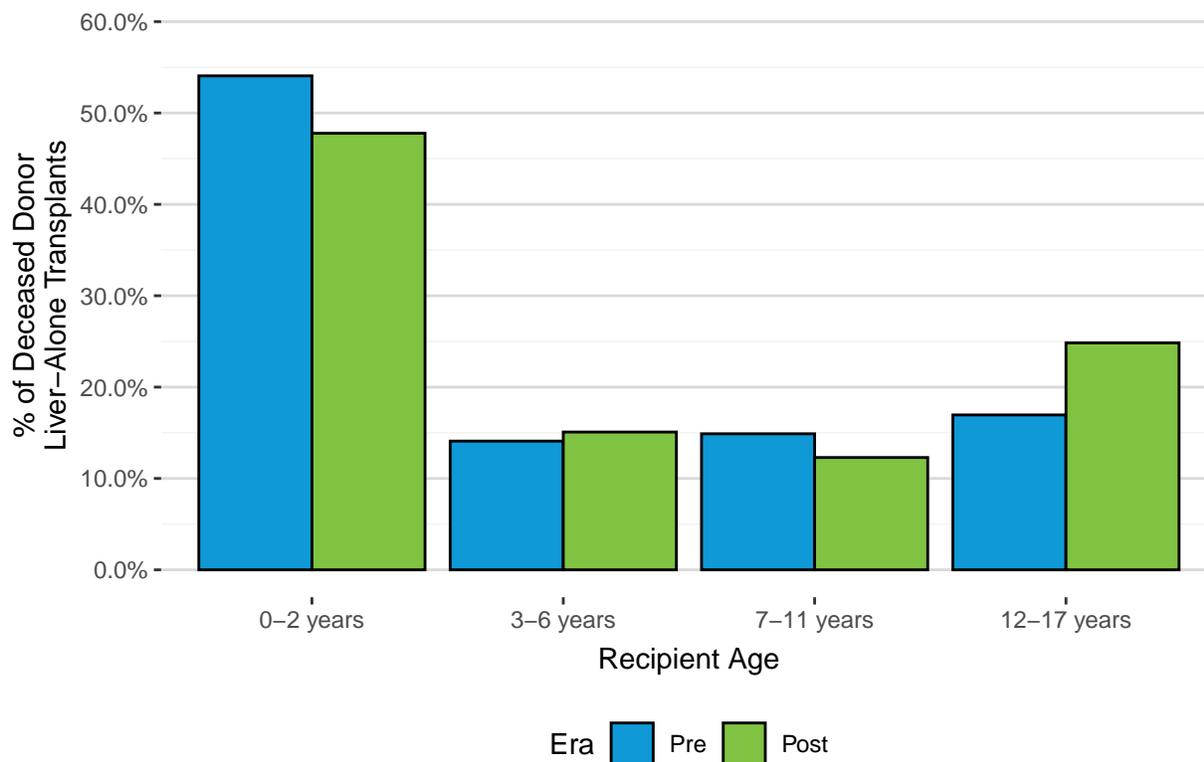
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 40. Number and Percent of Pediatric Deceased Donor Liver-Alone Transplants by Procedure Type and Era**

Procedure Type	Pre-Policy	Post-Policy
Partial/Segment Liver	82 (9.4%)	68 (8.6%)
Split Liver	218 (25.0%)	171 (21.7%)
Whole Liver	573 (65.6%)	550 (69.7%)
Total	873 (100.0%)	789 (100.0%)

Pediatric transplant distributions differed by recipient age. Post-policy there were a greater number of 12-17 year old transplants and a smaller number of 0-2 year old and 7-11 year old transplants.

**Figure 48. Pediatric Deceased Donor Liver-Alone Transplants by Recipient Age and Era**



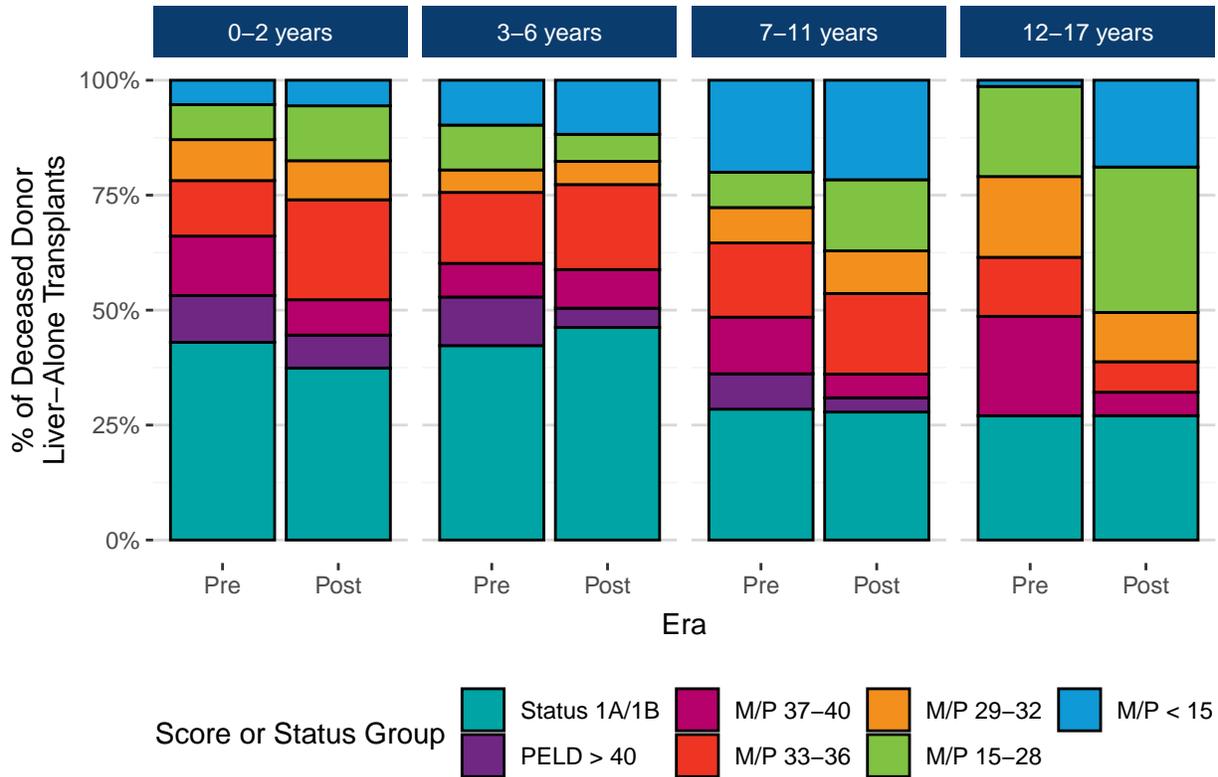
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 41. Number and Percent of Pediatric Deceased Donor Liver-Alone Transplants by Recipient Age and Era**

Recipient Age	Pre-Policy	Post-Policy
0-2 years	472 (54.1%)	377 (47.8%)
3-6 years	123 (14.1%)	119 (15.1%)
7-11 years	130 (14.9%)	97 (12.3%)
12-17 years	148 (17.0%)	196 (24.8%)
Total	873 (100.0%)	789 (100.0%)

In the 0-2 year old age group, there were fewer Status 1A/1B transplants and a greater number of PELD 15-28 and PELD 33-36 transplants post-policy. Transplant distributions remained similar in the 3-6 year old age group. There was a greater proportion of MELD/PELD 15-28 transplants in the 7-11 year old and 12-17 year old age groups post-policy.

**Figure 49. Pediatric Deceased Donor Liver-Alone Transplants by Recipient Age, Allocation MELD or PELD Score or Status, and Era**



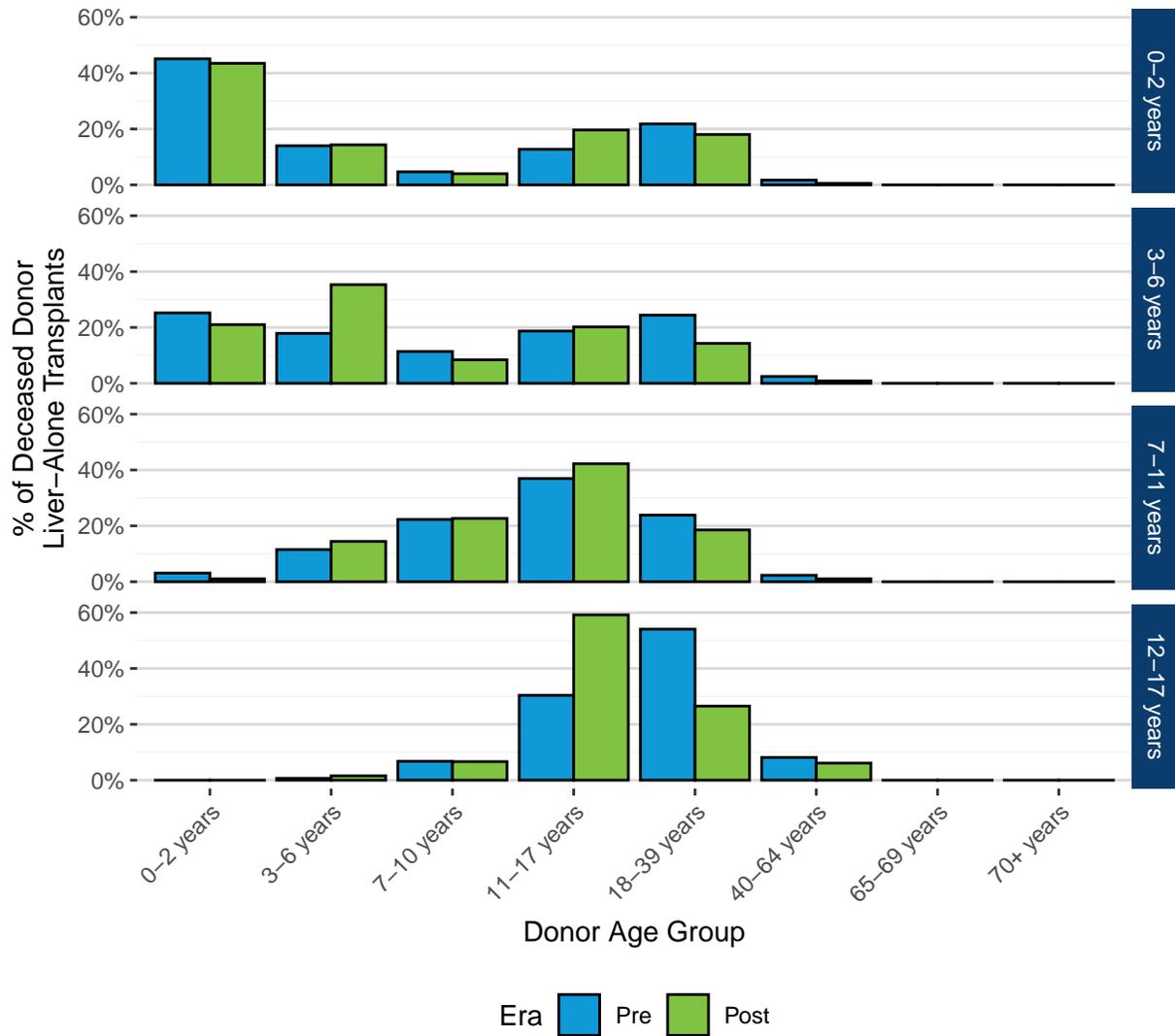
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 42. Number and Percent of Pediatric Deceased Donor Liver-Alone Transplants by Recipient Age, Allocation MELD or PELD Score or Status, and Era**

Recipient Age	Score or Status Group	Pre-Policy	Post-Policy
0-2 years	Status 1A/1B	203 (43.0%)	141 (37.4%)
	PELD > 40	48 (10.2%)	27 (7.2%)
	M/P 37-40	61 (12.9%)	29 (7.7%)
	M/P 33-36	57 (12.1%)	82 (21.8%)
	M/P 29-32	42 (8.9%)	32 (8.5%)
	M/P 15-28	36 (7.6%)	45 (11.9%)
	M/P < 15	25 (5.3%)	21 (5.6%)
	Total	472 (100.0%)	377 (100.0%)
3-6 years	Status 1A/1B	52 (42.3%)	55 (46.2%)
	PELD > 40	13 (10.6%)	5 (4.2%)
	M/P 37-40	9 (7.3%)	10 (8.4%)
	M/P 33-36	19 (15.4%)	22 (18.5%)
	M/P 29-32	6 (4.9%)	6 (5.0%)
	M/P 15-28	12 (9.8%)	7 (5.9%)
	M/P < 15	12 (9.8%)	14 (11.8%)
	Total	123 (100.0%)	119 (100.0%)
7-11 years	Status 1A/1B	37 (28.5%)	27 (27.8%)
	PELD > 40	10 (7.7%)	3 (3.1%)
	M/P 37-40	16 (12.3%)	5 (5.2%)
	M/P 33-36	21 (16.2%)	17 (17.5%)
	M/P 29-32	10 (7.7%)	9 (9.3%)
	M/P 15-28	10 (7.7%)	15 (15.5%)
	M/P < 15	26 (20.0%)	21 (21.6%)
	Total	130 (100.0%)	97 (100.0%)
12-17 years	Status 1A/1B	40 (27.0%)	53 (27.0%)
	M/P 37-40	32 (21.6%)	10 (5.1%)
	M/P 33-36	19 (12.8%)	13 (6.6%)
	M/P 29-32	26 (17.6%)	21 (10.7%)
	M/P 15-28	29 (19.6%)	62 (31.6%)
	M/P < 15	2 (1.4%)	37 (18.9%)
	Total	148 (100.0%)	196 (100.0%)

The distributions of pediatric transplants by donor age remained relatively similar pre- and post-policy for the younger children but shifted in the adolescent group (12-17 years at transplant). Adolescent transplants were more likely to receive livers from donors aged 11-17 years and less likely to receive livers from donors aged 18-39 years post-policy compared to pre-policy.

**Figure 50. Pediatric Deceased Donor Liver-Alone Transplants by Recipient Age, Donor Age, and Era**



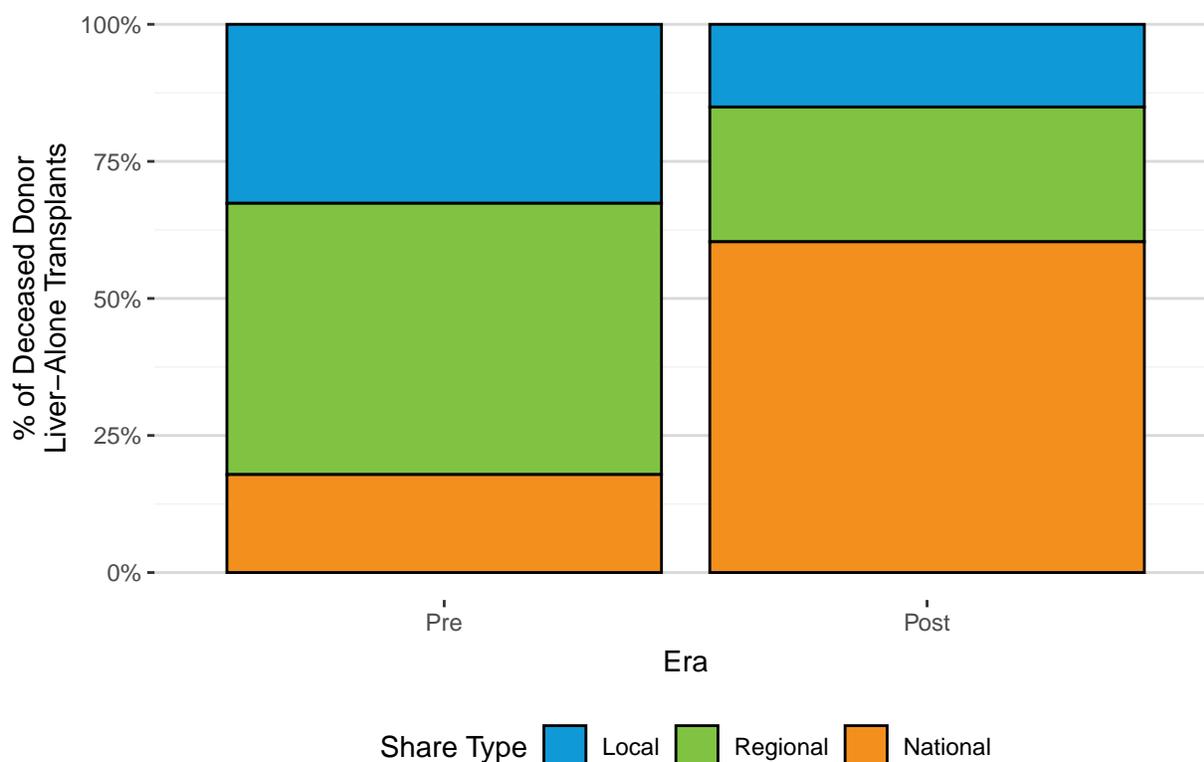
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 43. Number and Percent of Pediatric Deceased Donor Liver-Along Transplants by Recipient Age, Donor Age, and Era**

Recipient Age	Donor Age	Pre-Policy	Post-Policy
0-2 years	0-2 years	213 (45.1%)	164 (43.5%)
	3-6 years	66 (14.0%)	54 (14.3%)
	7-10 years	22 (4.7%)	15 (4.0%)
	11-17 years	60 (12.7%)	74 (19.6%)
	18-39 years	103 (21.8%)	68 (18.0%)
	40-64 years	8 (1.7%)	2 (0.5%)
	Total	472 (100.0%)	377 (100.0%)
3-6 years	0-2 years	31 (25.2%)	25 (21.0%)
	3-6 years	22 (17.9%)	42 (35.3%)
	7-10 years	14 (11.4%)	10 (8.4%)
	11-17 years	23 (18.7%)	24 (20.2%)
	18-39 years	30 (24.4%)	17 (14.3%)
	40-64 years	3 (2.4%)	1 (0.8%)
	Total	123 (100.0%)	119 (100.0%)
7-11 years	0-2 years	4 (3.1%)	1 (1.0%)
	3-6 years	15 (11.5%)	14 (14.4%)
	7-10 years	29 (22.3%)	22 (22.7%)
	11-17 years	48 (36.9%)	41 (42.3%)
	18-39 years	31 (23.8%)	18 (18.6%)
	40-64 years	3 (2.3%)	1 (1.0%)
	Total	130 (100.0%)	97 (100.0%)
12-17 years	0-2 years	0 (0.0%)	0 (0.0%)
	3-6 years	1 (0.7%)	3 (1.5%)
	7-10 years	10 (6.8%)	13 (6.6%)
	11-17 years	45 (30.4%)	116 (59.2%)
	18-39 years	80 (54.1%)	52 (26.5%)
	40-64 years	12 (8.1%)	12 (6.1%)
	Total	148 (100.0%)	196 (100.0%)

Just under one-third of pediatric liver transplants were local (transplant center within same DSA as donor hospital) in the pre-policy era compared to about 15% in the post-policy era. Similarly, the regional share dropped from 50% pre-policy to 25% post-policy and the national share increased from 18% pre-policy to 60% post-policy.

**Figure 52. Pediatric Deceased Donor Liver-Along Transplants by Donor Share Type and Era**



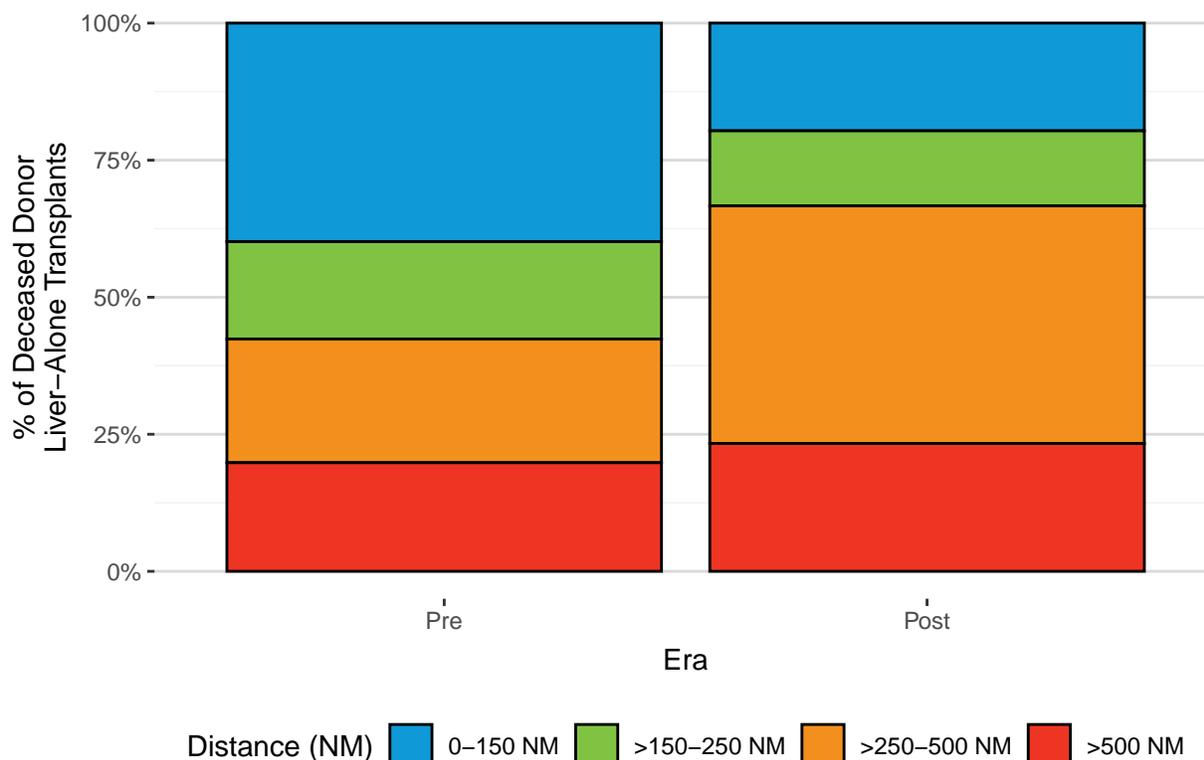
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 45. Number and Percent of Pediatric Deceased Donor Liver-Along Transplants by Donor Share Type and Era**

Donor Share Type	Pre-Policy	Post-Policy
Local	285 (32.6%)	119 (15.1%)
Regional	432 (49.5%)	194 (24.6%)
National	156 (17.9%)	476 (60.3%)
Total	873 (100.0%)	789 (100.0%)

Since this policy removed DSA and OPTN region as units of allocation and now uses circles around the donor hospital of the potential liver donor, the distance that deceased donor livers travel has been of interest. Based on information that is reported to the OPTN, this is defined as the straight-line nautical mile (NM) distance between donor hospital and transplant center. Unlike statute (regular) miles, NM do take into account some curvature of the earth. There was a decrease in liver transplants occurring within 150 NM of the donor hospital post-policy. There has been a subsequent increase in liver transplants occurring over 250 NM but within 500 NM of the donor hospital. Liver transplants occurring over 500 NM remained relatively consistent pre- and post-policy.

**Figure 53. Pediatric Deceased Donor Liver-Along Transplants by Classification Distance and Era**



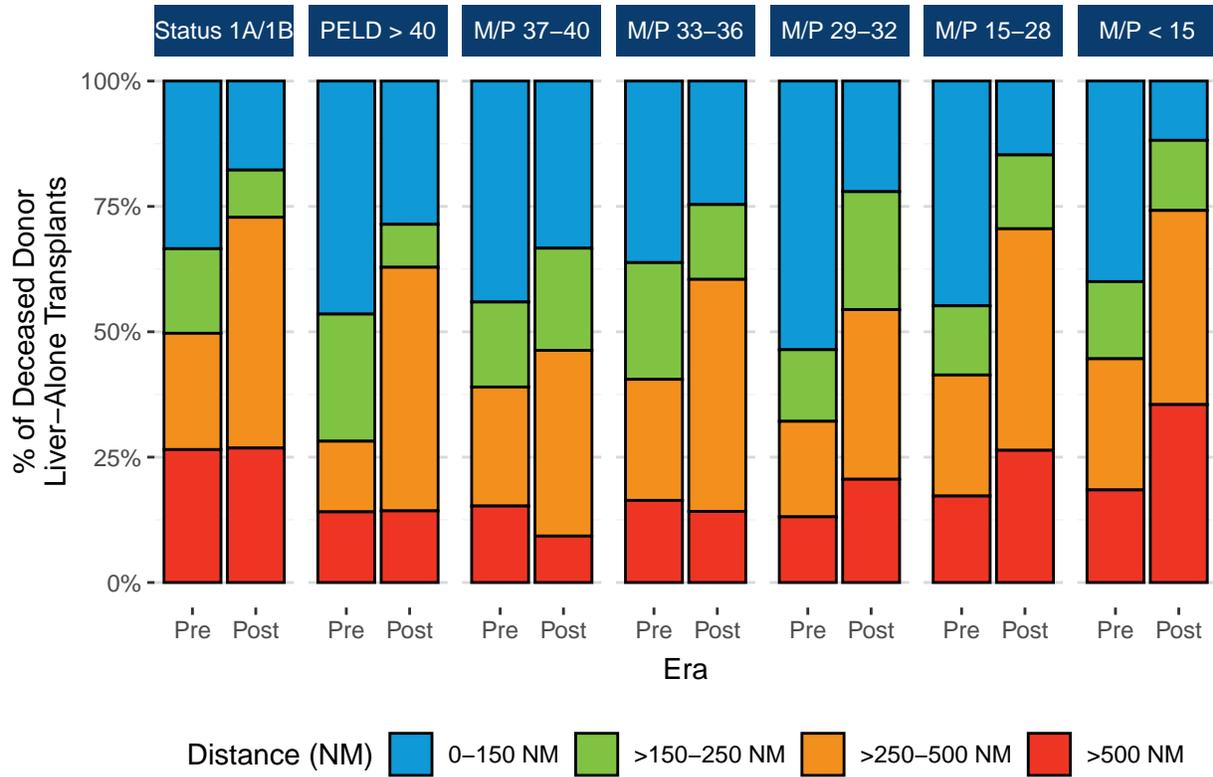
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 46. Number and Percent of Pediatric Deceased Donor Liver-Along Transplants by Classification Distance and Era**

Classification Distance	Pre-Policy	Post-Policy
0-150 NM	348 (39.9%)	155 (19.6%)
>150-250 NM	155 (17.8%)	108 (13.7%)
>250-500 NM	197 (22.6%)	342 (43.3%)
>500 NM	173 (19.8%)	184 (23.3%)
Total	873 (100.0%)	789 (100.0%)

There has been a substantial change in the distribution of distance between donor hospital and transplant program in all post-policy periods by score group. Notably in the post-policy eras, all allocation score groups have a lower proportion of transplants in the 0-150 NM group and a higher proportion of transplants in the >250-500 NM classification group.

**Figure 54. Pediatric Deceased Donor Liver-Alone Transplants by Allocation MELD or PELD Score or Status, Classification Distance, and Era**



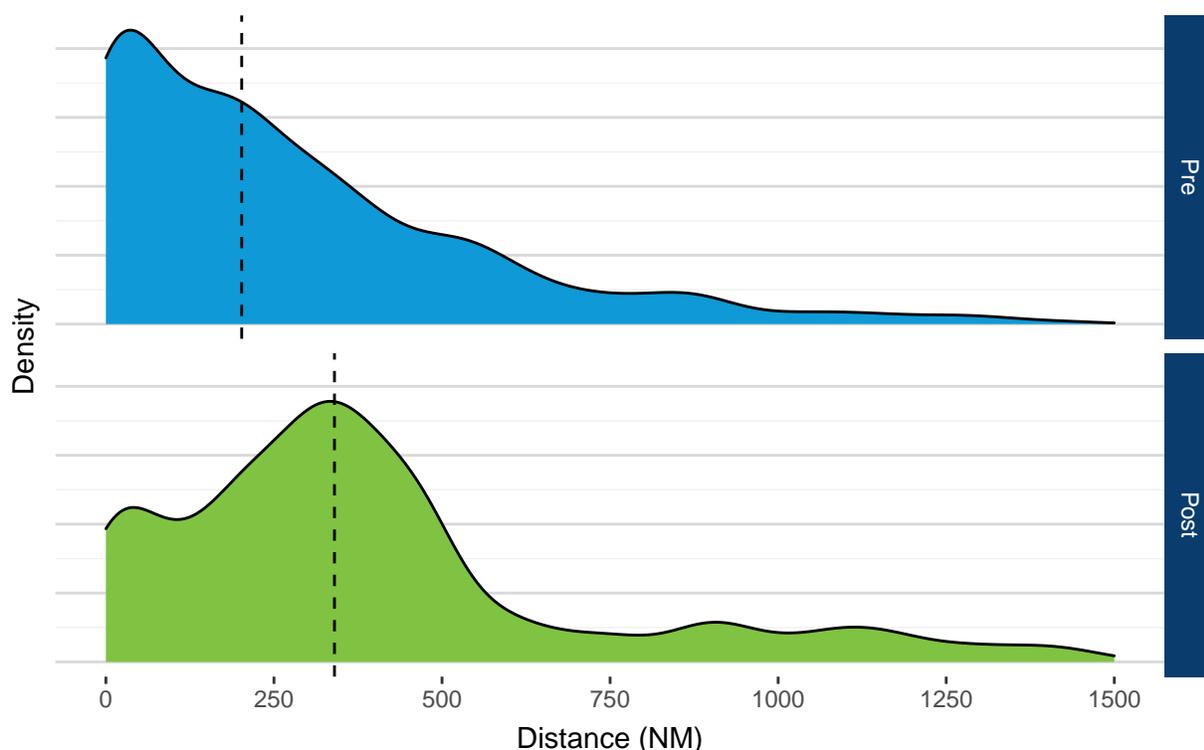
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 47. Number and Percent of Pediatric Deceased Donor Liver-Alone Transplants by Allocation MELD or PELD Score or Status, Classification Distance, and Era**

Score or Status Group	Classification Distance	Pre-Policy	Post-Policy
Status 1A/1B	0-150 NM	111 (33.4%)	49 (17.8%)
	>150-250 NM	56 (16.9%)	26 (9.4%)
	>250-500 NM	77 (23.2%)	127 (46.0%)
	>500 NM	88 (26.5%)	74 (26.8%)
	Total	332 (100.0%)	276 (100.0%)
PELD > 40	0-150 NM	33 (46.5%)	10 (28.6%)
	>150-250 NM	18 (25.4%)	3 (8.6%)
	>250-500 NM	10 (14.1%)	17 (48.6%)
	>500 NM	10 (14.1%)	5 (14.3%)
	Total	71 (100.0%)	35 (100.0%)
M/P 37-40	0-150 NM	52 (44.1%)	18 (33.3%)
	>150-250 NM	20 (16.9%)	11 (20.4%)
	>250-500 NM	28 (23.7%)	20 (37.0%)
	>500 NM	18 (15.3%)	5 (9.3%)
	Total	118 (100.0%)	54 (100.0%)
M/P 33-36	0-150 NM	42 (36.2%)	33 (24.6%)
	>150-250 NM	27 (23.3%)	20 (14.9%)
	>250-500 NM	28 (24.1%)	62 (46.3%)
	>500 NM	19 (16.4%)	19 (14.2%)
	Total	116 (100.0%)	134 (100.0%)
M/P 29-32	0-150 NM	45 (53.6%)	15 (22.1%)
	>150-250 NM	12 (14.3%)	16 (23.5%)
	>250-500 NM	16 (19.0%)	23 (33.8%)
	>500 NM	11 (13.1%)	14 (20.6%)
	Total	84 (100.0%)	68 (100.0%)
M/P 15-28	0-150 NM	39 (44.8%)	19 (14.7%)
	>150-250 NM	12 (13.8%)	19 (14.7%)
	>250-500 NM	21 (24.1%)	57 (44.2%)
	>500 NM	15 (17.2%)	34 (26.4%)
	Total	87 (100.0%)	129 (100.0%)
M/P < 15	0-150 NM	26 (40.0%)	11 (11.8%)
	>150-250 NM	10 (15.4%)	13 (14.0%)
	>250-500 NM	17 (26.2%)	36 (38.7%)
	>500 NM	12 (18.5%)	33 (35.5%)
	Total	65 (100.0%)	93 (100.0%)

The median distance from donor hospital to transplant program increased from 202 NM pre-policy to 340 NM post-policy. Post-policy, there is a larger proportion of transplants where livers traveled between 250 and 500 NM.

**Figure 55. Distribution of Distance from Donor Hospital to Transplant Program for Pediatric Deceased Donor Liver-Alone Transplants by Era**



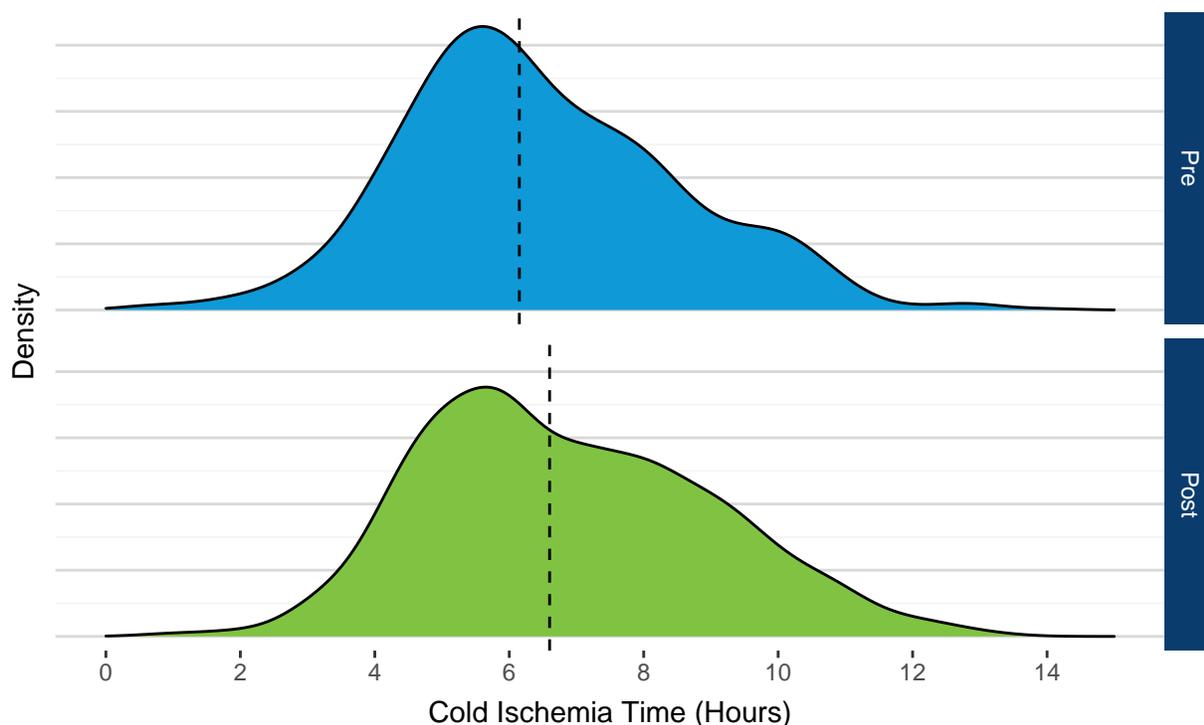
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.  
 \*\* Dotted lines indicate median distance within each era.  
 \*\*\* There were 14 pre-policy and 19 post-policy transplants with distance >1500 NM not included.

**Table 48. Summary of Distance from Donor Hospital to Transplant Program for Pediatric Deceased Donor Liver-Alone Transplants by Era**

Era	N	N Missing	Distance (NM)					
			Minimum	25th Percentile	Median	Mean	75th Percentile	Maximum
Pre	873	0	0	49	202	298.07	406	2218
Post	789	0	0	196	340	432.21	492	2205

Given the increase in distance post-policy, median cold ischemia time increased by roughly 27 minutes. However, the distribution of cold ischemia time is relatively similar pre- and post-policy.

**Figure 56. Distribution of Cold Ischemia Time for Pediatric Deceased Donor Liver-Alone Transplants by Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

\*\* Dotted lines indicate median cold ischemia time within each era.

\*\*\* There were 11 pre-policy and 6 post-policy transplant recipients with missing cold ischemia time that are not included.  
 ^ There were 1 pre-policy and 1 post-policy transplants with cold ischemia time >15 hours not included.

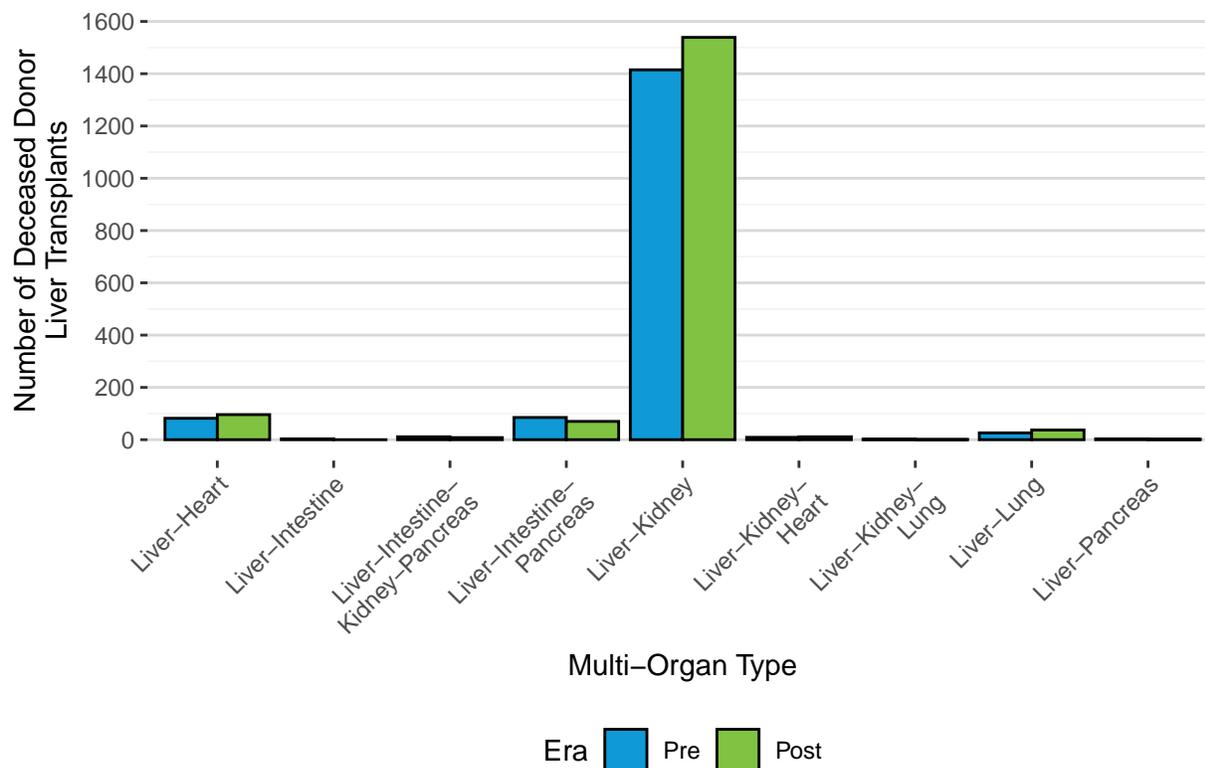
**Table 49. Distribution of Cold Ischemia Time for Pediatric Deceased Donor Liver-Alone Transplants by Era**

Era	N	N Missing	Time (hours)					
			Minimum	25th Percentile	Median	Mean	75th Percentile	Maximum
Pre	862	11	0.5	5.02	6.15	6.47	7.80	17.28
Post	783	6	1.0	5.22	6.60	6.87	8.35	17.00

### Liver Multi-Organ Transplants

There were 1,764 multi-organ liver transplants post-policy compared to 1,636 pre-policy. Distributions of multi-organ type remained similar pre- and post-policy, and liver-alone transplants made up roughly 90% of all liver transplants during both policy eras.

**Figure 57. Deceased Donor Liver Transplants by Multi-Organ Type and Era**



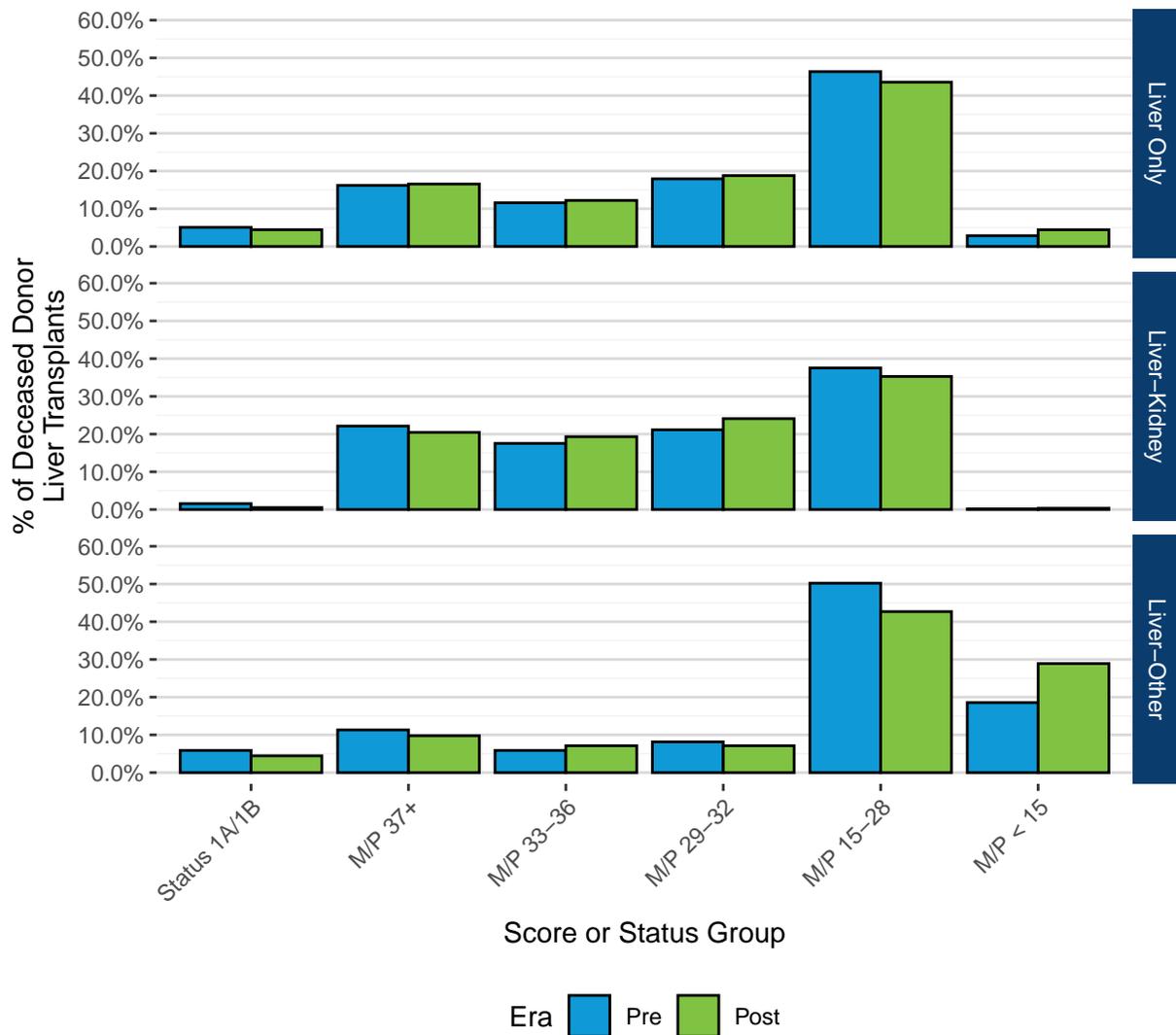
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 50. Number and Percent of Deceased Donor Liver Transplants by Multi-Organ Type and Era**

Multi-Organ Type	Pre-Policy	Post-Policy
Liver Only	14646 (90.0%)	15278 (89.6%)
Liver-Heart	82 (0.5%)	96 (0.6%)
Liver-Intestine	3 (0.0%)	0 (0.0%)
Liver-Intestine-Kidney-Pancreas	11 (0.1%)	8 (0.0%)
Liver-Intestine-Pancreas	85 (0.5%)	70 (0.4%)
Liver-Kidney	1415 (8.7%)	1539 (9.0%)
Liver-Kidney-Heart	9 (0.1%)	11 (0.1%)
Liver-Kidney-Lung	2 (0.0%)	1 (0.0%)
Liver-Lung	26 (0.2%)	37 (0.2%)
Liver-Pancreas	3 (0.0%)	2 (0.0%)
Total	16282 (100.0%)	17042 (100.0%)

Distributions of MELD or PELD Score or Status groups were similar for liver only and liver-kidney transplants. Recipients of liver-other transplants had a larger proportion of MELD/PELD scores <15.

**Figure 58. Deceased Donor Liver Transplants by Multi-Organ Type, Allocation MELD or PELD Score or Status, and Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 51. Number and Percent of Deceased Donor Liver Transplants by Multi-Organ Type, Allocation MELD or PELD Score or Status, and Era**

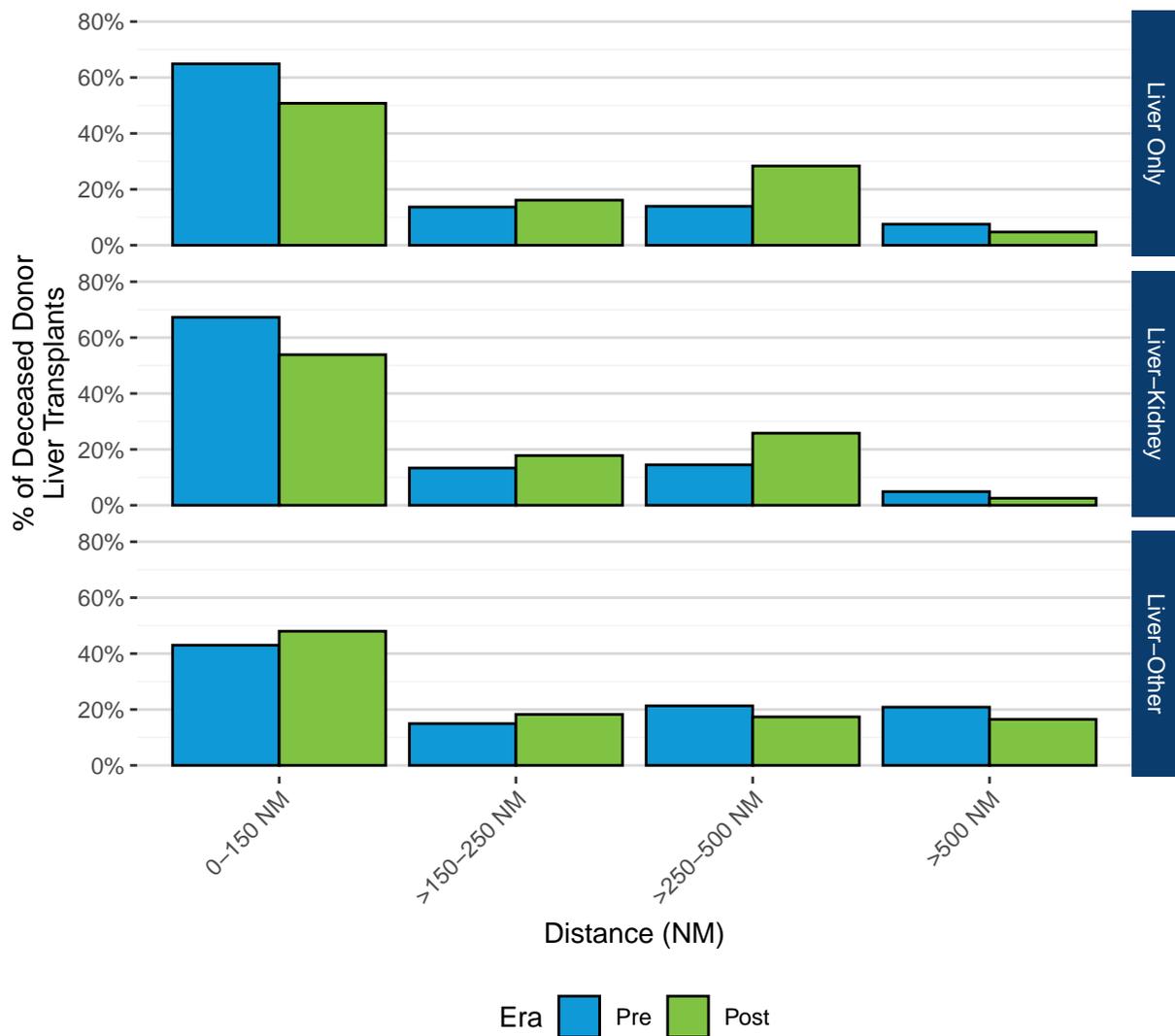
Multi-Organ Type	Score or Status Group	Pre-Policy	Post-Policy
Liver Only	Status 1A/1B	744 (5.1%)	678 (4.4%)
	M/P 37+	2371 (16.2%)	2530 (16.6%)
	M/P 33-36	1697 (11.6%)	1866 (12.2%)
	M/P 29-32	2626 (17.9%)	2871 (18.8%)
	M/P 15-28	6790 (46.4%)	6657 (43.6%)
	M/P < 15	418 (2.9%)	676 (4.4%)
	Total	14646 (100.0%)	15278 (100.0%)
Liver-Kidney	Status 1A/1B	22 (1.6%)	8 (0.5%)
	M/P 37+	313 (22.1%)	315 (20.5%)
	M/P 33-36	248 (17.5%)	297 (19.3%)
	M/P 29-32	299 (21.1%)	371 (24.1%)
	M/P 15-28	531 (37.5%)	543 (35.3%)
	M/P < 15	2 (0.1%)	5 (0.3%)
	Total	1415 (100.0%)	1539 (100.0%)
Liver-Other	Status 1A/1B	13 (5.9%)	10 (4.4%)
	M/P 37+	25 (11.3%)	22 (9.8%)
	M/P 33-36	13 (5.9%)	16 (7.1%)
	M/P 29-32	18 (8.1%)	16 (7.1%)
	M/P 15-28	111 (50.2%)	96 (42.7%)
	M/P < 15	41 (18.6%)	65 (28.9%)
	Total	221 (100.0%)	225 (100.0%)

With the implementation of the acuity circles allocation policy, changes were also made to the sharing requirements for SLK. If an OPO is offering a kidney and liver from the same deceased donor, then before allocating the kidney to kidney alone candidates, the OPO must offer the kidney with the liver to candidates who meet SLK eligibility criteria and are:

1. Within 150 NM of the donor hospital and have a MELD or PELD  $\geq 15$ ,
2. Within 250 NM of the donor hospital and have a MELD or PELD  $\geq 29$ , or
3. Within 250 NM of the donor hospital and Status 1A or 1B.

Changes in distribution of distance from donor hospital to transplant program were similar for SLK transplant recipients to those for liver-alone transplant recipients, with fewer livers traveling within 150 NM post-policy. Conversely, for liver-other transplants, a higher proportion of livers traveled within 150 NM post-policy compared to pre-policy.

**Figure 59. Deceased Donor Liver Transplants by Multi-Organ Type, Classification Distance, and Era**



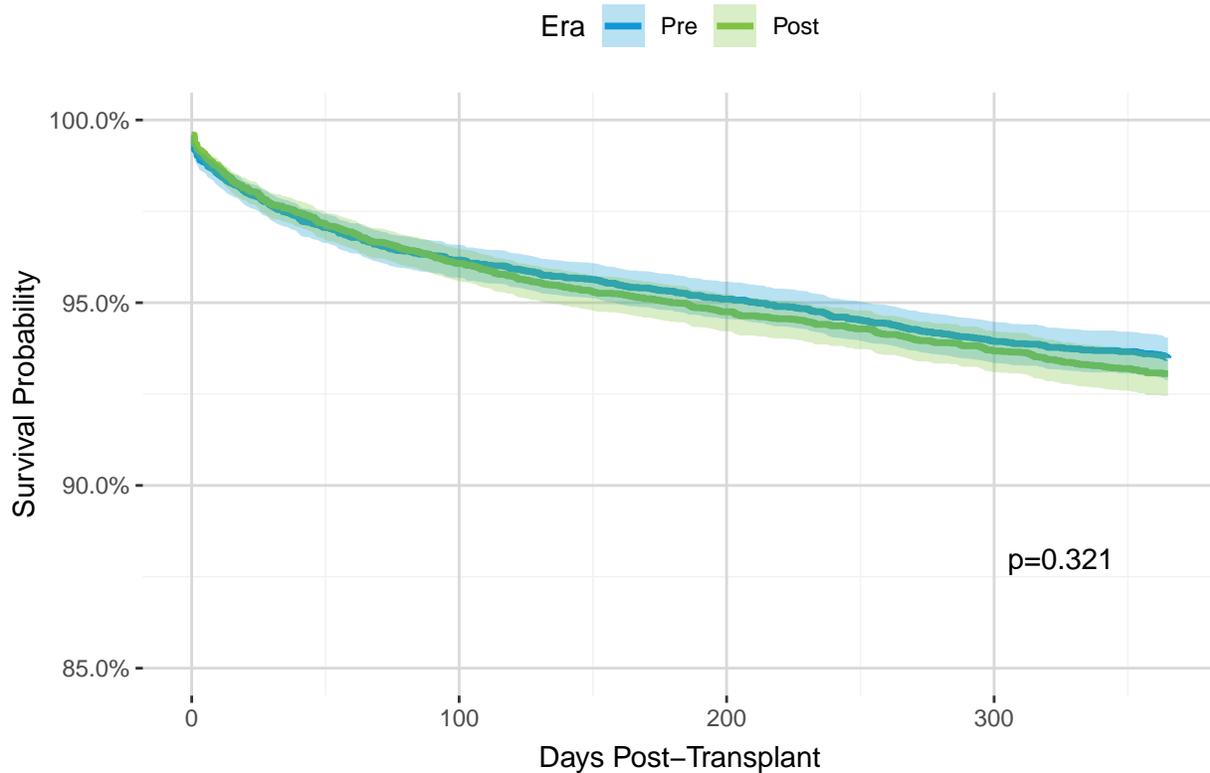
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 52. Number and Percent of Deceased Donor Liver Transplants by Multi-Organ Type, Classification Distance, and Era**

Multi-Organ Type	Classification Distance	Pre-Policy	Post-Policy
Liver Only	0-150 NM	9503 (64.9%)	7761 (50.8%)
	>150-250 NM	2001 (13.7%)	2462 (16.1%)
	>250-500 NM	2042 (13.9%)	4333 (28.4%)
	>500 NM	1100 (7.5%)	722 (4.7%)
	Total	14646 (100.0%)	15278 (100.0%)
Liver-Kidney	0-150 NM	952 (67.3%)	829 (53.9%)
	>150-250 NM	189 (13.4%)	274 (17.8%)
	>250-500 NM	205 (14.5%)	397 (25.8%)
	>500 NM	69 (4.9%)	39 (2.5%)
	Total	1415 (100.0%)	1539 (100.0%)
Liver-Other	0-150 NM	95 (43.0%)	108 (48.0%)
	>150-250 NM	33 (14.9%)	41 (18.2%)
	>250-500 NM	47 (21.3%)	39 (17.3%)
	>500 NM	46 (20.8%)	37 (16.4%)
	Total	221 (100.0%)	225 (100.0%)

**Liver-Along Post-Transplant Outcomes**

**Figure 60. One Year Post-Transplant Patient Survival Curves for Deceased Donor Liver-Along Recipients by Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

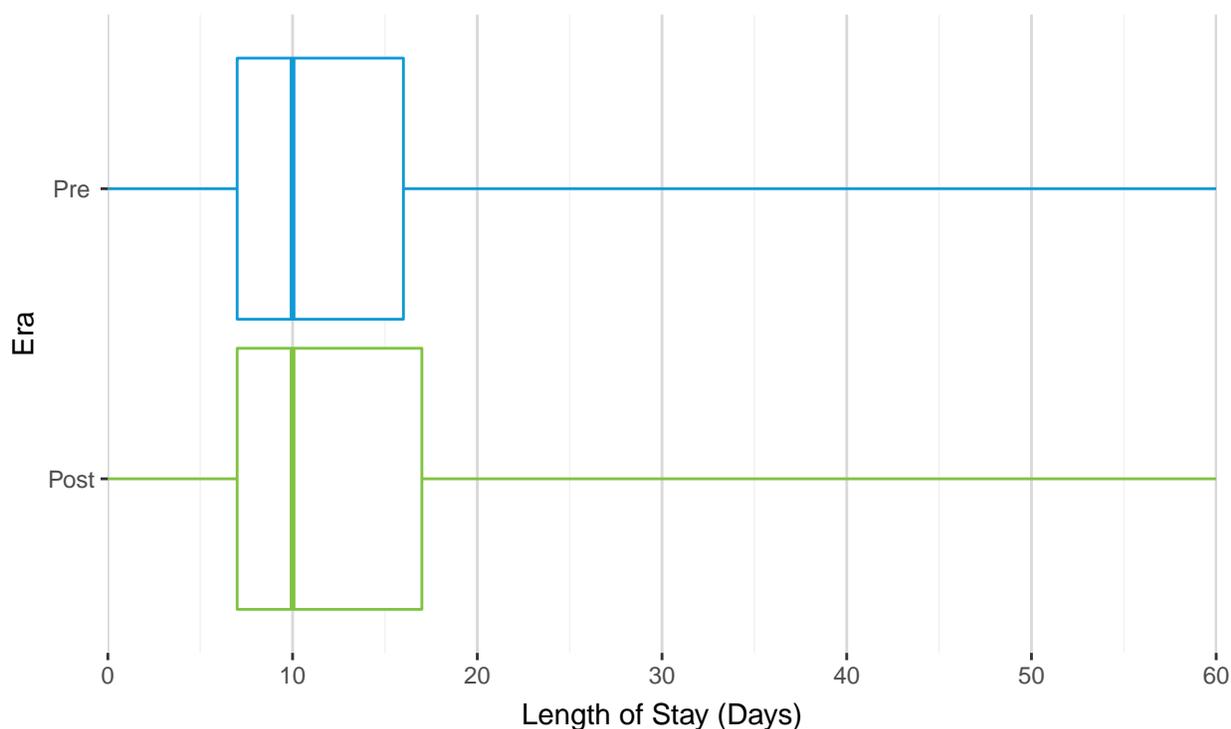
**Table 53. One Year Post-Transplant Patient Survival Estimates for Deceased Donor Liver-Along Recipients by Era**

Era	N At Risk	Survival Probability	
		Estimate	95% CI
Pre	6404	93.5%	(92.9%, 94.0%)
Post	4293	93.1%	(92.4%, 93.6%)

One year patient survival for deceased donor, liver-alone recipients showed no statistically significant difference between pre- and post-policy eras (p=0.321). The probability of survival at one year post-transplant was 93.5% and 93.1%, pre- and post-policy, respectively.

The distribution of post-transplant length of stay remained similar post-policy compared to pre-policy.

**Figure 61. Distribution of Length of Post-Transplant Stay for Deceased Donor Liver-Alone Recipients by Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.

Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022

\*\* There were 179 pre-policy and 320 post-policy transplant recipients with missing length of stay that are not included.

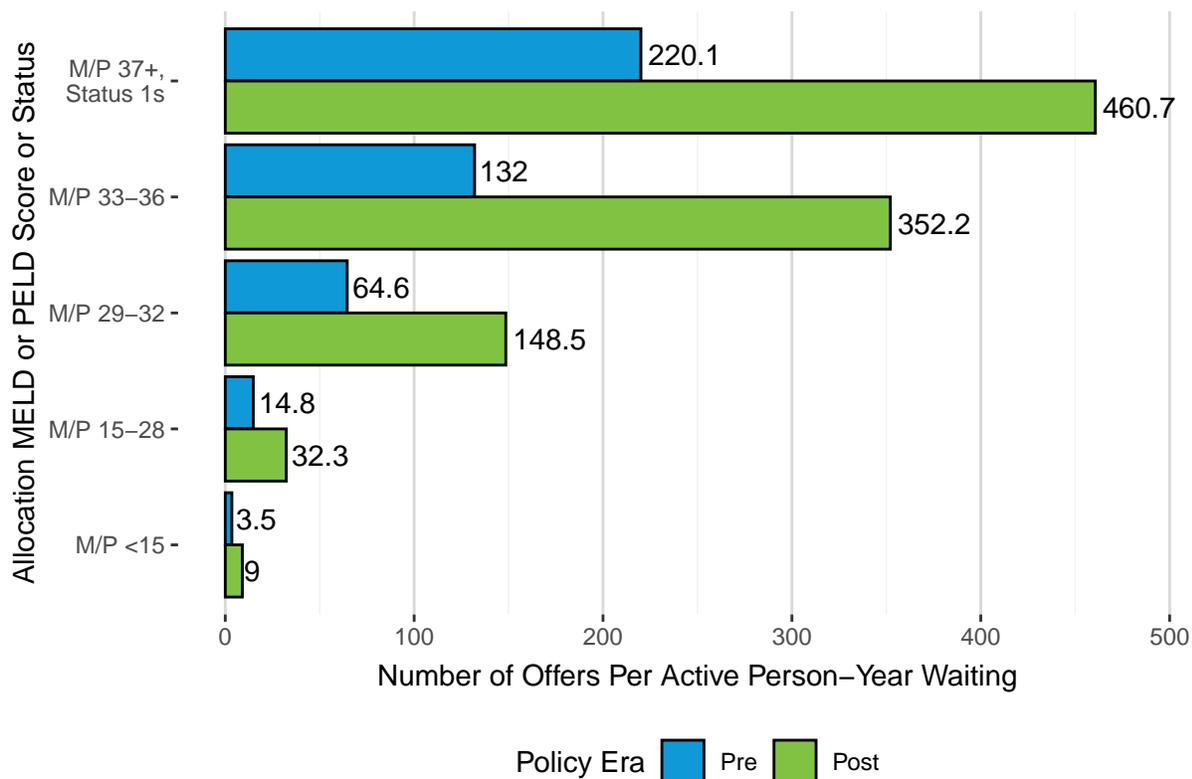
\*\*\* There were 425 pre-policy and 457 post-policy transplant recipients with length of stay > 60 days not included.

**Table 54. Distribution of Length of Post-Transplant Stay for Deceased Donor Liver-Alone Recipients by Era**

Era	N	N Missing	Length of Stay (Days)					
			Minimum	25th Percentile	Median	Mean	75th Percentile	Maximum
Pre	14467	179	0	7	10	15.9	16	618
Post	14958	320	0	7	10	16.0	17	404

### Section III. Offer Rates

Figure 62. Number of Offers Per Patient-Year Waiting by Allocation MELD or PELD Score or Status and Era



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

Patient years take into account both the number of people at a given score/status as well as the amount of time each person spends at the given score/status. For example, if candidate *Z* spent 9 months at a MELD of 25 and 3 months at a MELD of 31, they would contribute 0.75 person-years to the MELD/PELD 15-28 group, and 0.25 person-years to the MELD/PELD 29-32 group. Summing this for all candidates on the waiting list contributing time during the era makes up the denominator of the offers per active patient-year waiting metric. Active patient-years are used since candidates are not able to receive offers when inactive.

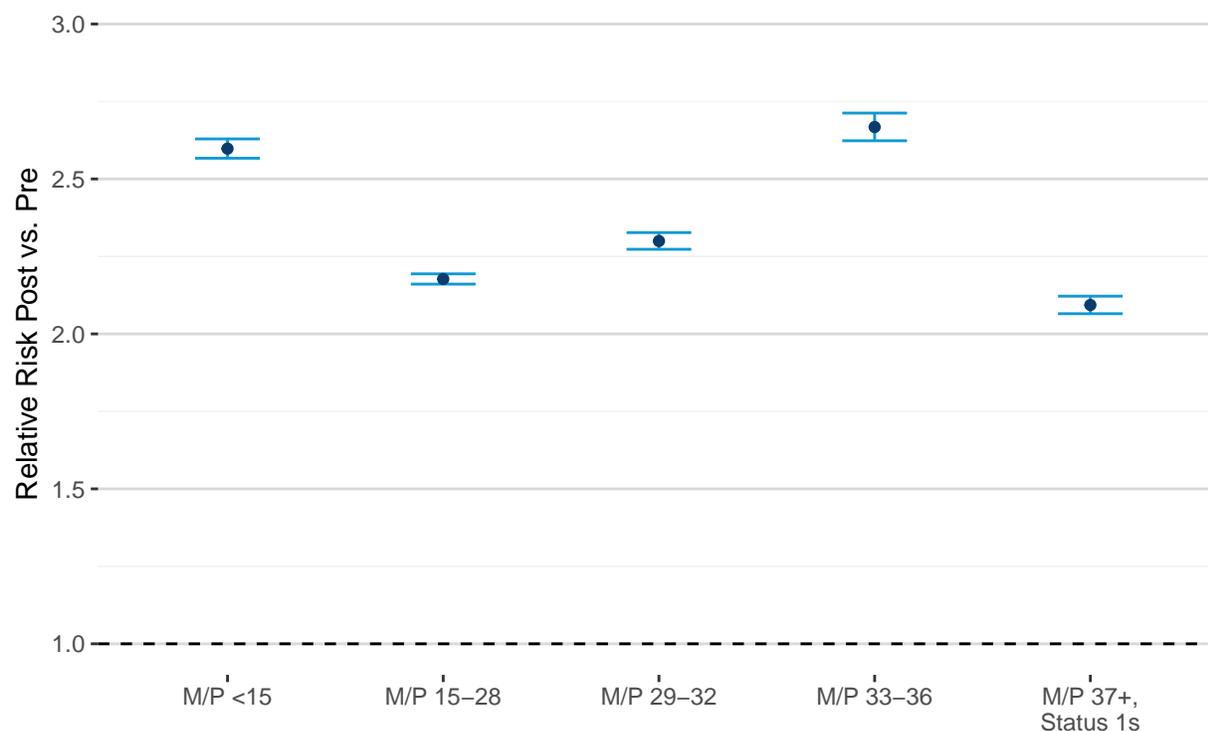
The numerator sums the number of offers received by candidates within the particular score/status. So, if the same candidate *Z* received one offer at their MELD 25, and 7 offers at MELD 31, these would be added to the numerator for the respective score groups.

As shown in the figure above, all MELD or PELD score or status groups experienced an increase in the number of offers per active person-year waiting post-policy.

**Table 55. Number of Offers Per Patient-Year Waiting by Allocation MELD or PELD Score or Status and Era**

Score Group	Era	Ever Waiting	Offers	Active Person-Years	Offers per Active PY		Risk Ratio (vs. Pre-Policy)	
		N	N	PY	Estimate	95% CI	Estimate	95% CI
M/P <15	Pre	20072	38456	11047.80	3.48	(3.45, 3.52)	Ref.	Ref.
	Post	18056	88004	9731.79	9.04	(8.98, 9.10)	2.60	(2.57, 2.63)
M/P 15-28	Pre	20107	98708	6657.08	14.83	(14.74, 14.92)	Ref.	Ref.
	Post	19085	206155	6385.98	32.28	(32.14, 32.42)	2.18	(2.16, 2.19)
M/P 29-32	Pre	7127	50682	784.76	64.58	(64.02, 65.15)	Ref.	Ref.
	Post	5659	62288	419.36	148.53	(147.37, 149.70)	2.30	(2.27, 2.33)
M/P 33-36	Pre	3825	25763	195.16	132.01	(130.40, 133.63)	Ref.	Ref.
	Post	3326	29328	83.28	352.15	(348.13, 356.21)	2.67	(2.62, 2.71)
M/P 37+, Status 1s M/P 37+,	Pre	4485	37731	171.45	220.06	(217.85, 222.30)	Ref.	Ref.
	Post	4361	47685	103.52	460.66	(456.53, 464.81)	2.09	(2.07, 2.12)

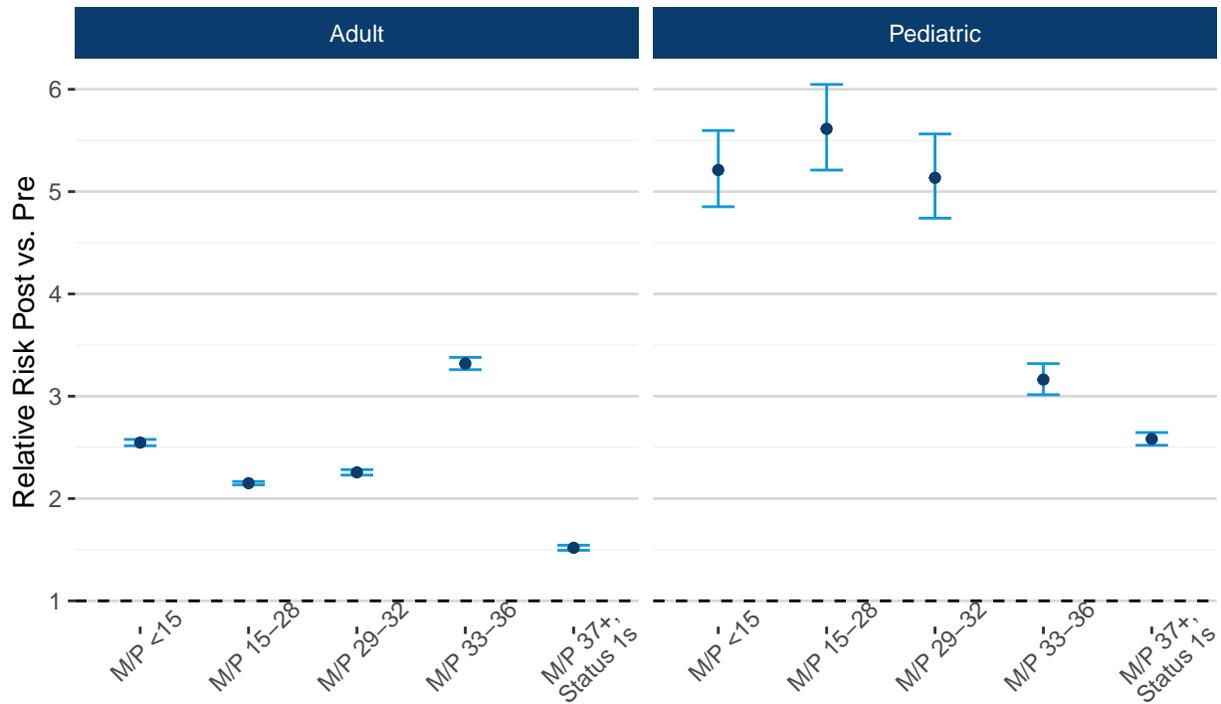
For all allocation MELD/PELD scores/statuses, there was an increase in the rate of offers per active patient-year waiting in the post-policy era. This was equivalent to a 2.09-fold increase from pre- to post-policy for MELD/PELD 37+ and Status 1s and a 2.67-fold increase for MELD/PELD 33-36.

**Figure 63. Relative Risk Comparing Post- to Pre-Policy Offers Per Patient-Year Waiting by Allocation MELD or PELD Score or Status**

Allocation MELD or PELD Score or Status  
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

For all allocation MELD/PELD scores/statuses for both adult (18+ years) and pediatric (< 18 years) candidates, there was an increase in the rate of offers per active patient-year waiting in the post-policy era. These increases were more pronounced for pediatric candidates with MELD/PELD scores below 33..

**Figure 64. Relative Risk Comparing Post- to Pre-Policy Offers Per Patient-Year Waiting by Allocation MELD or PELD Score or Status and Age at Listing**



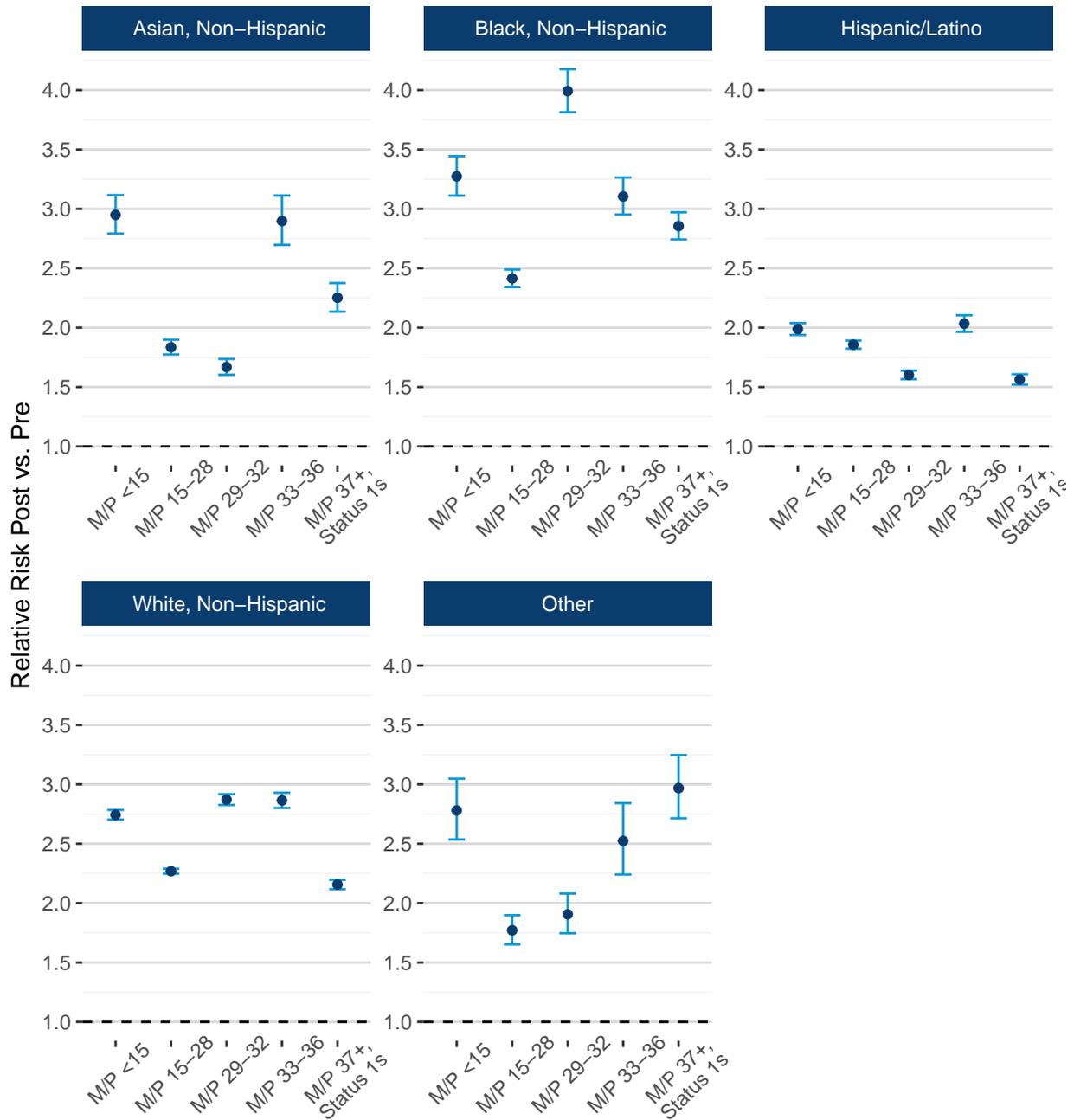
Allocation MELD or PELD Score or Status  
 National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 56. Number of Offers Per Patient-Year Waiting by Allocation MELD or PELD Score or Status, Age at Listing, and Era**

Age at Listing	Score Group	Era	Ever Waiting	Offers	Active Person-Years	Offers per Active PY		Risk Ratio (vs. Pre-Policy)	
			N	N	PY	Estimate	95% CI	Estimate	95% CI
Pediatric	M/P <15	Pre	774	958	235.66	4.07	(3.81, 4.33)	Ref.	Ref.
		Post	642	3512	165.77	21.19	(20.49, 21.90)	5.21	(4.85, 5.6)
	M/P 15-28	Pre	584	869	114.90	7.56	(7.07, 8.08)	Ref.	Ref.
		Post	469	3407	80.24	42.46	(41.04, 43.91)	5.61	(5.21, 6.0)
	M/P 29-32	Pre	374	812	47.90	16.95	(15.81, 18.16)	Ref.	Ref.
		Post	217	2290	26.30	87.06	(83.53, 90.70)	5.14	(4.74, 5.6)
	M/P 33-36	Pre	361	2341	50.53	46.33	(44.47, 48.24)	Ref.	Ref.
		Post	345	5786	39.49	146.53	(142.78, 150.35)	3.16	(3.01, 3.3)
	M/P 37+, Status 1s	Pre	747	12388	106.86	115.92	(113.89, 117.98)	Ref.	Ref.
		Post	568	14126	47.19	299.35	(294.43, 304.33)	2.58	(2.52, 2.6)
Adult	M/P <15	Pre	19301	37498	10812.14	3.47	(3.43, 3.50)	Ref.	Ref.
		Post	17416	84492	9566.02	8.83	(8.77, 8.89)	2.55	(2.52, 2.6)
	M/P 15-28	Pre	19527	97839	6542.40	14.95	(14.86, 15.05)	Ref.	Ref.
		Post	18618	202748	6305.90	32.15	(32.01, 32.29)	2.15	(2.13, 2.2)
	M/P 29-32	Pre	6754	49870	737.01	67.67	(67.07, 68.26)	Ref.	Ref.
		Post	5442	59998	393.06	152.64	(151.42, 153.87)	2.26	(2.23, 2.3)
	M/P 33-36	Pre	3465	23422	144.62	161.95	(159.88, 164.04)	Ref.	Ref.
		Post	2981	23542	43.79	537.56	(530.71, 544.47)	3.32	(3.26, 3.4)
	M/P 37+, Status 1s	Pre	3738	25343	64.59	392.36	(387.54, 397.22)	Ref.	Ref.
		Post	3793	33559	56.33	595.80	(589.44, 602.21)	1.52	(1.49, 1.5)

Across allocation score groups, all race/ethnicity groups experienced increases in offers per patient-year waiting pre- to post-policy era. However, this increase was lowest for Hispanic, Asian, and Other race/ethnicity groups, depending on MELD or PELD score or status group.

**Figure 66. Relative Risk Post- Versus Pre-Policy of Offers Per Patient-Year Waiting by Allocation MELD or PELD Score or Status and Race/Ethnicity**



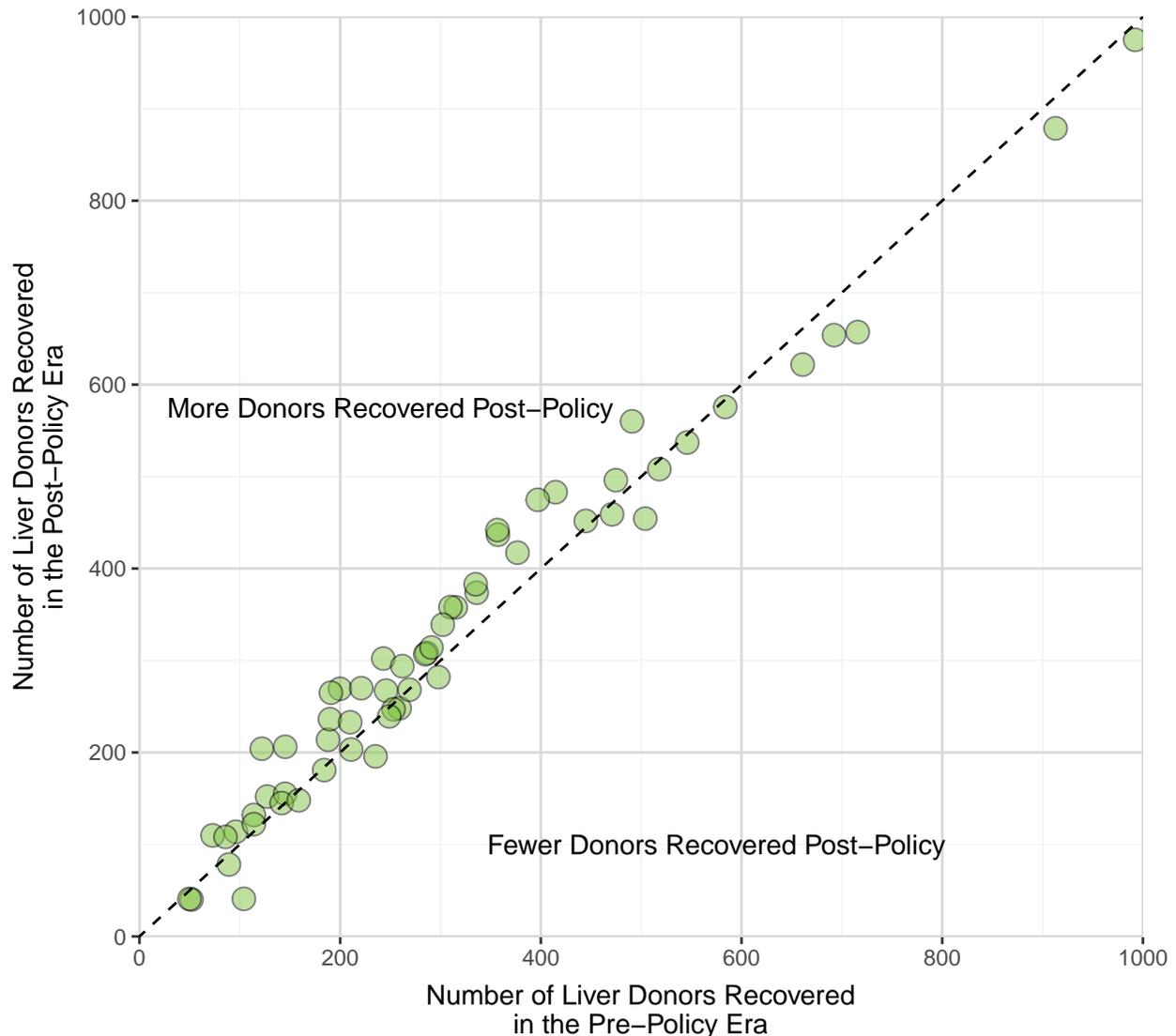
Allocation MELD or PELD Score or Status  
 National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 57. Number of Offers Per Patient-Year Waiting by Allocation MELD or PELD Score or Status, Race/Ethnicity, and Era**

Race/Ethnicity	Score Group	Era	Ever Waiting	Offers	Active Person-Years	Offers per Active PY		Risk Ratio (vs. Pre-Policy)		
			N	N	PY	Estimate	95% CI	Estimate	95% CI	
Asian, Non-Hispanic	M/P <15	Pre	1006	1826	569.38	3.21	(3.06, 3.36)	Ref.	Ref.	
		Post	843	4265	450.85	9.46	(9.18, 9.75)	2.95	(2.79, 3.1)	
	M/P 15-28	Pre	742	4901	215.87	22.70	(22.07, 23.35)	Ref.	Ref.	
		Post	719	10906	261.79	41.66	(40.88, 42.45)	1.83	(1.77, 1.9)	
	M/P 29-32	Pre	428	4530	81.72	55.44	(53.83, 57.07)	Ref.	Ref.	
		Post	305	5175	55.95	92.50	(89.99, 95.05)	1.67	(1.60, 1.7)	
	M/P 33-36	Pre	210	1620	15.92	101.74	(96.84, 106.82)	Ref.	Ref.	
		Post	147	1386	4.70	294.81	(279.49, 310.75)	2.90	(2.70, 3.1)	
	M/P 37+, Status 1s	Pre	263	2587	12.67	204.12	(196.33, 212.14)	Ref.	Ref.	
		Post	238	2822	6.14	459.63	(442.83, 476.91)	2.25	(2.13, 2.4)	
	Black, Non-Hispanic	M/P <15	Pre	1369	2035	752.67	2.70	(2.59, 2.82)	Ref.	Ref.
			Post	1157	5634	636.50	8.85	(8.62, 9.09)	3.27	(3.11, 3.4)
M/P 15-28		Pre	1328	5863	402.82	14.55	(14.18, 14.93)	Ref.	Ref.	
		Post	1186	13942	396.75	35.14	(34.56, 35.73)	2.41	(2.34, 2.5)	
M/P 29-32		Pre	497	3146	56.78	55.41	(53.49, 57.38)	Ref.	Ref.	
		Post	375	4560	20.62	221.15	(214.78, 227.67)	3.99	(3.81, 4.2)	
M/P 33-36		Pre	311	2428	21.50	112.91	(108.46, 117.49)	Ref.	Ref.	
		Post	292	4099	11.69	350.55	(339.90, 361.45)	3.10	(2.95, 3.3)	
M/P 37+, Status 1s		Pre	451	3714	18.75	198.07	(191.75, 204.55)	Ref.	Ref.	
		Post	476	6836	12.09	565.53	(552.21, 579.10)	2.86	(2.74, 3.0)	
Hispanic/Latino		M/P <15	Pre	3663	9431	1966.01	4.80	(4.70, 4.89)	Ref.	Ref.
			Post	3448	16850	1767.04	9.54	(9.39, 9.68)	1.99	(1.94, 2.0)
	M/P 15-28	Pre	3460	17884	1205.18	14.84	(14.62, 15.06)	Ref.	Ref.	
		Post	3359	32614	1183.60	27.55	(27.26, 27.86)	1.86	(1.82, 1.9)	
	M/P 29-32	Pre	1476	13818	190.79	72.42	(71.22, 73.64)	Ref.	Ref.	
		Post	1248	17215	148.40	116.01	(114.28, 117.75)	1.60	(1.57, 1.6)	
	M/P 33-36	Pre	811	7251	49.50	146.48	(143.13, 149.89)	Ref.	Ref.	
		Post	705	6034	20.25	297.90	(290.44, 305.52)	2.03	(1.97, 2.1)	
	M/P 37+, Status 1s	Pre	982	9556	39.10	244.39	(239.51, 249.34)	Ref.	Ref.	
		Post	896	9905	25.92	382.09	(374.60, 389.69)	1.56	(1.52, 1.6)	
	White, Non-Hispanic	M/P <15	Pre	13771	24539	7628.30	3.22	(3.18, 3.26)	Ref.	Ref.
			Post	12348	59590	6752.30	8.83	(8.75, 8.90)	2.74	(2.70, 2.8)
M/P 15-28		Pre	14277	68826	4731.60	14.55	(14.44, 14.66)	Ref.	Ref.	
		Post	13531	146434	4438.25	32.99	(32.82, 33.16)	2.27	(2.25, 2.3)	
M/P 29-32		Pre	4587	28101	439.24	63.98	(63.23, 64.73)	Ref.	Ref.	
		Post	3633	34399	187.26	183.70	(181.76, 185.65)	2.87	(2.83, 2.9)	
M/P 33-36		Pre	2408	13901	103.05	134.89	(132.66, 137.15)	Ref.	Ref.	
		Post	2107	17283	44.73	386.42	(380.68, 392.22)	2.86	(2.80, 2.9)	
M/P 37+, Status 1s		Pre	2693	21204	97.32	217.88	(214.96, 220.84)	Ref.	Ref.	
		Post	2652	26420	56.24	469.79	(464.14, 475.49)	2.16	(2.12, 2.2)	
Other		M/P <15	Pre	288	625	134.41	4.65	(4.29, 5.03)	Ref.	Ref.
			Post	282	1665	128.79	12.93	(12.31, 13.56)	2.78	(2.54, 3.0)
	M/P 15-28	Pre	335	1234	106.61	11.57	(10.94, 12.24)	Ref.	Ref.	
		Post	316	2259	110.18	20.50	(19.67, 21.37)	1.77	(1.65, 1.9)	
	M/P 29-32	Pre	144	1087	16.52	65.79	(61.93, 69.82)	Ref.	Ref.	
		Post	110	939	7.49	125.41	(117.51, 133.69)	1.91	(1.75, 2.1)	
	M/P 33-36	Pre	86	563	5.27	106.86	(98.22, 116.06)	Ref.	Ref.	
		Post	79	526	1.95	269.65	(247.09, 293.71)	2.52	(2.24, 2.8)	
	M/P 37+, Status 1s	Pre	103	670	3.69	181.69	(168.19, 195.98)	Ref.	Ref.	
		Post	103	1702	3.16	539.26	(513.94, 565.50)	2.97	(2.71, 3.2)	

## Section IV. Liver Utilization

Figure 67. Scatter Plot of OPO Volume by Era



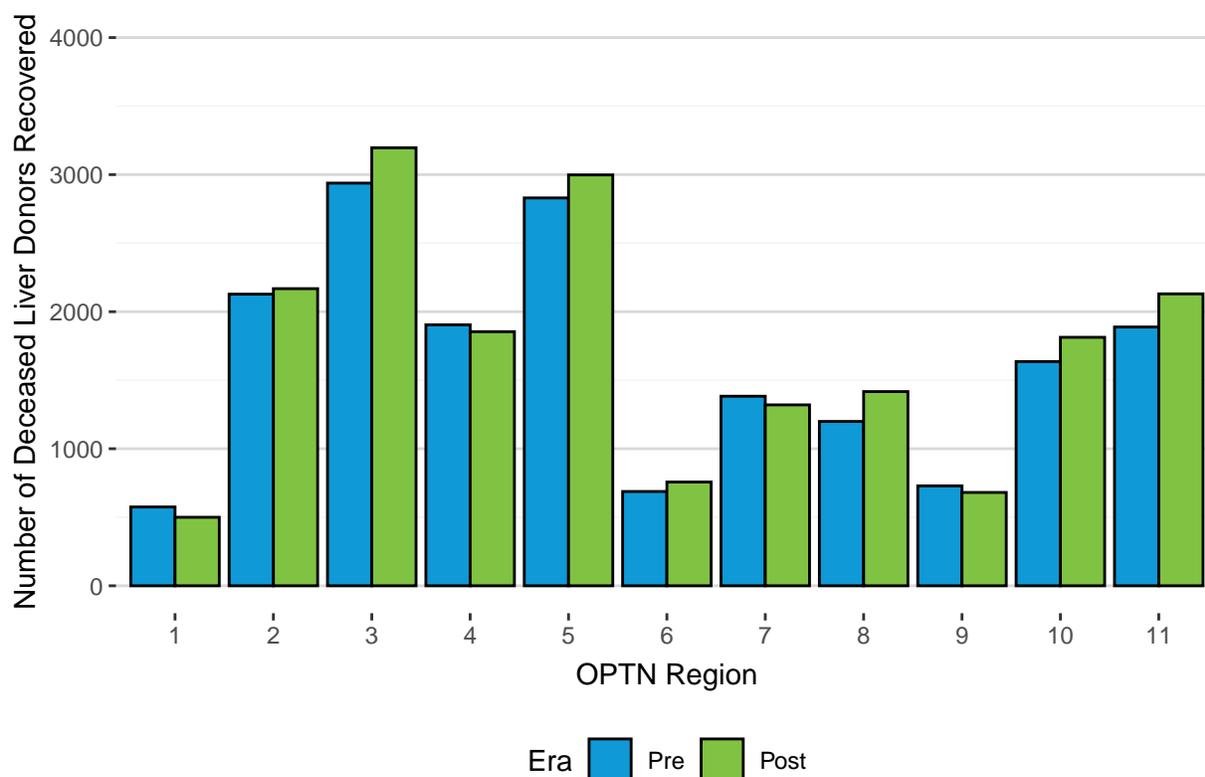
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

Any points along the diagonal dashed line indicate no changes in the absolute number of deceased liver donors recovered by an OPO, pre- to post-policy. Points that fall above the diagonal represent OPOs that recovered more deceased liver donors post-policy compared to pre-policy. Points that fall below the diagonal represent OPOs that recovered fewer liver donors post-policy compared to pre-policy. A table of deceased liver donors recovered by OPO can be found in the **Appendix**.

The majority of OPOs recovered a similar number of liver donors pre- and post-policy. A Spearman's rank correlation of  $\rho = 0.906$  indicates a strong positive, monotonic relationship between these two measures. The Kruskal-Wallis test indicated that there was not a statistically significant change pre- to post-policy in the number of liver donors recovered within each OPO ( $\chi^2_1 = 0.4764$ ,  $p = 0.49$ ).

Overall, there was an increase in the number of liver donors recovered post-policy compared to pre-policy (percent change 5.2%). The figure below illustrates this by OPTN region. The **Appendix** highlights these trends by OPO as well.

**Figure 68. Deceased Liver Donors Recovered by OPTN Region and Era**



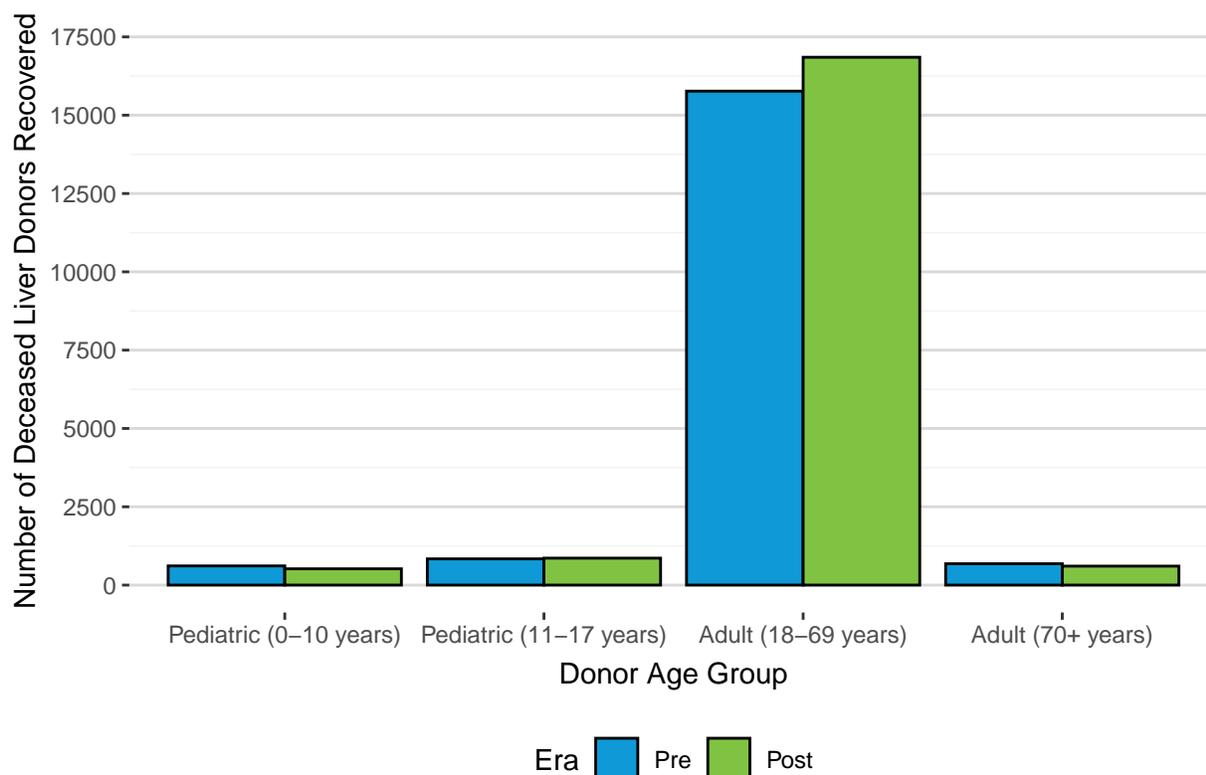
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 58. Number of Deceased Liver Donors Recovered by OPTN Region and Era**

OPTN Region	Pre-Policy	Post-Policy
1	575 (3.2%)	500 (2.7%)
2	2128 (11.9%)	2168 (11.5%)
3	2938 (16.4%)	3196 (17.0%)
4	1904 (10.6%)	1854 (9.8%)
5	2830 (15.8%)	2998 (15.9%)
6	688 (3.8%)	757 (4.0%)
7	1383 (7.7%)	1320 (7.0%)
8	1199 (6.7%)	1417 (7.5%)
9	729 (4.1%)	681 (3.6%)
10	1636 (9.1%)	1813 (9.6%)
11	1888 (10.5%)	2130 (11.3%)
Total	17898 (100.0%)	18834 (100.0%)

There were fewer pediatric liver donors recovered post-policy in the 0-10 year old age group. There were more donors recovered in the 18-69 year old age group.

**Figure 69. Deceased Liver Donors Recovered by Donor Age and Era**



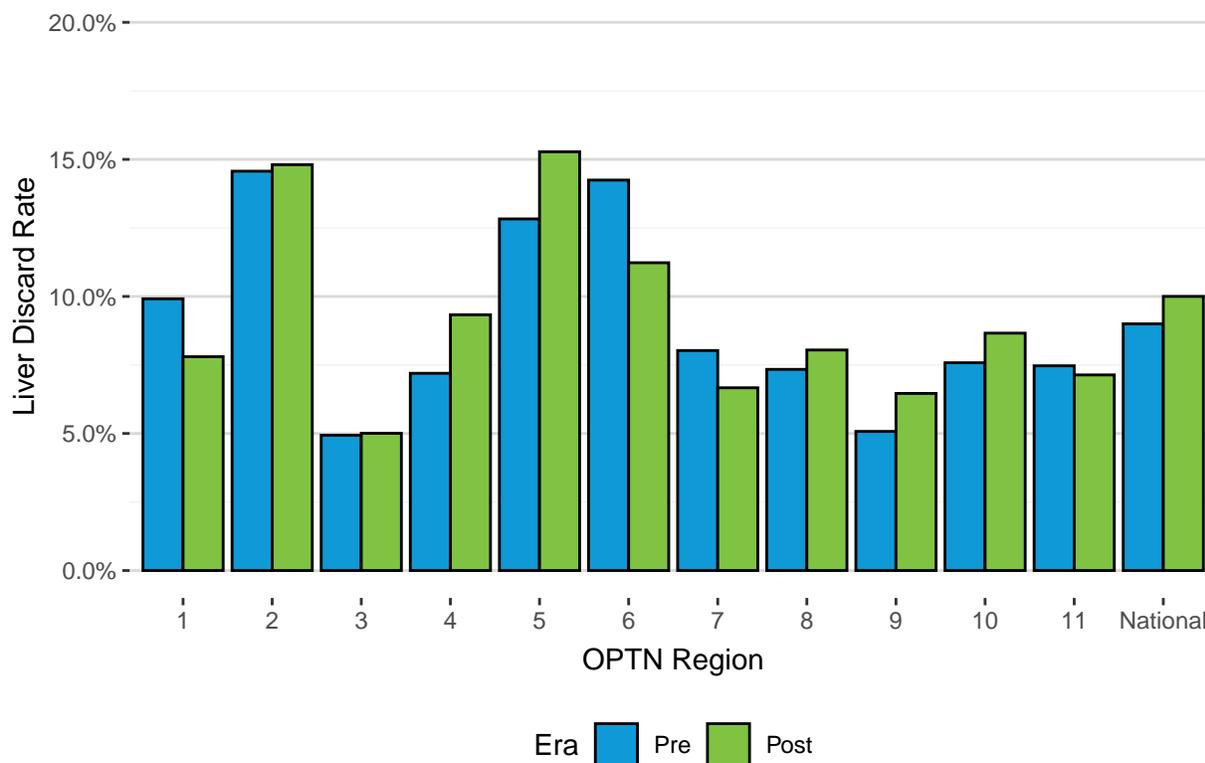
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 59. Number of Deceased Liver Donors Recovered by Donor Age and Era**

Donor Age	Pre-Policy	Post-Policy
Pediatric (0-10 years)	612 (3.4%)	520 (2.8%)
Pediatric (11-17 years)	837 (4.7%)	860 (4.6%)
Adult (18-69 years)	15,768 (88.1%)	16,849 (89.5%)
Adult (70+ years)	681 (3.8%)	605 (3.2%)
Total	17,898 (100.0%)	18,834 (100.0%)

Discard rate is defined as the number of livers not transplanted over the number of deceased liver donors recovered, multiplied by 100 to get a percentage. Nationally the liver discard rate went from 9.0% pre-policy to 9.5% post-policy. Changes in discard rates by OPTN region continue to differ.

**Figure 70. Liver Discard Rate by OPTN Region and Era**



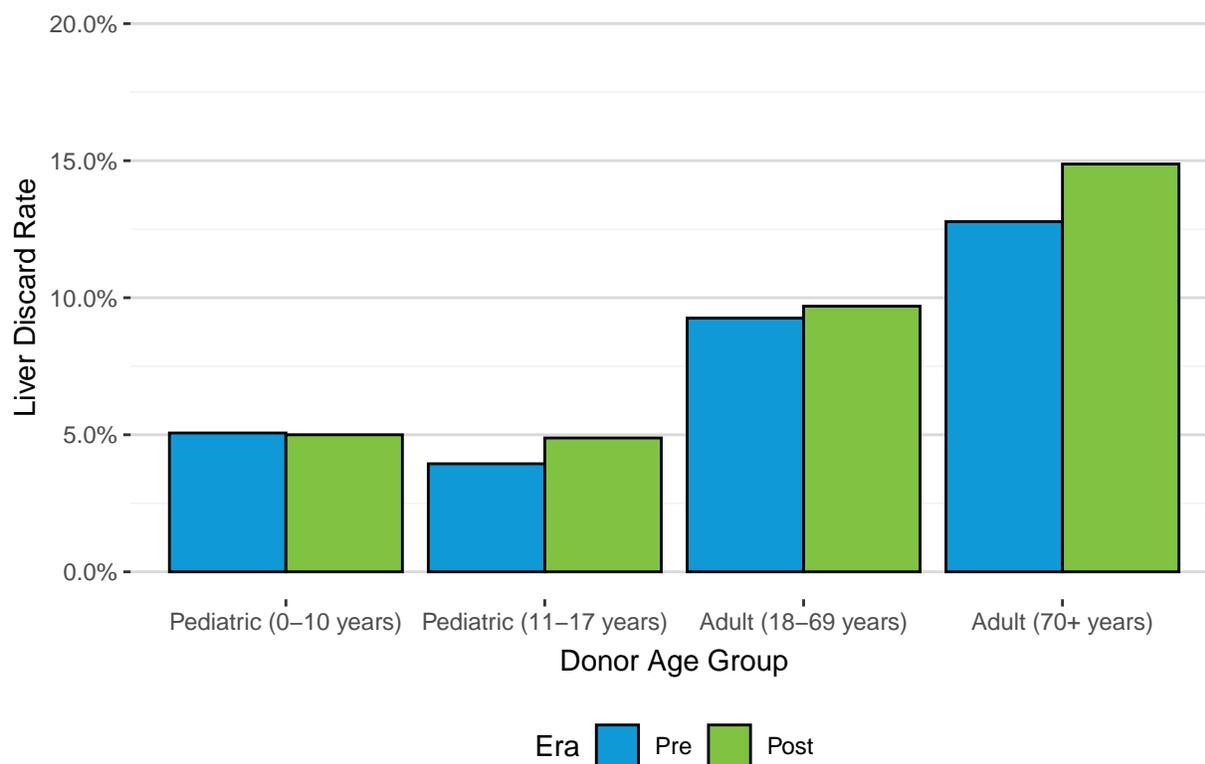
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 59. Liver Discard Rate by OPTN Region and Era**

OPTN Region	Pre-Policy			Post-Policy		
	Recovered	Discarded	%	Recovered	Discarded	%
1	575	57	9.91	500	39	7.80
2	2128	310	14.57	2168	321	14.81
3	2938	145	4.94	3196	160	5.01
4	1904	137	7.20	1854	173	9.33
5	2830	363	12.83	2998	458	15.28
6	688	98	14.24	757	85	11.23
7	1383	111	8.03	1320	88	6.67
8	1199	88	7.34	1417	114	8.05
9	729	37	5.08	681	44	6.46
10	1636	124	7.58	1813	157	8.66
11	1888	141	7.47	2130	152	7.14
National	17898	1611	9.00	18834	1791	9.51

Discard rates vary by donor age group. Post-policy, the discard rate increased slightly for liver donors in the 11-17 year old, 18-69 year old, and 70+ year old age groups and remained stable in the 0-10 year old age group.

**Figure 71. Liver Discard Rate by Donor Age and Era**



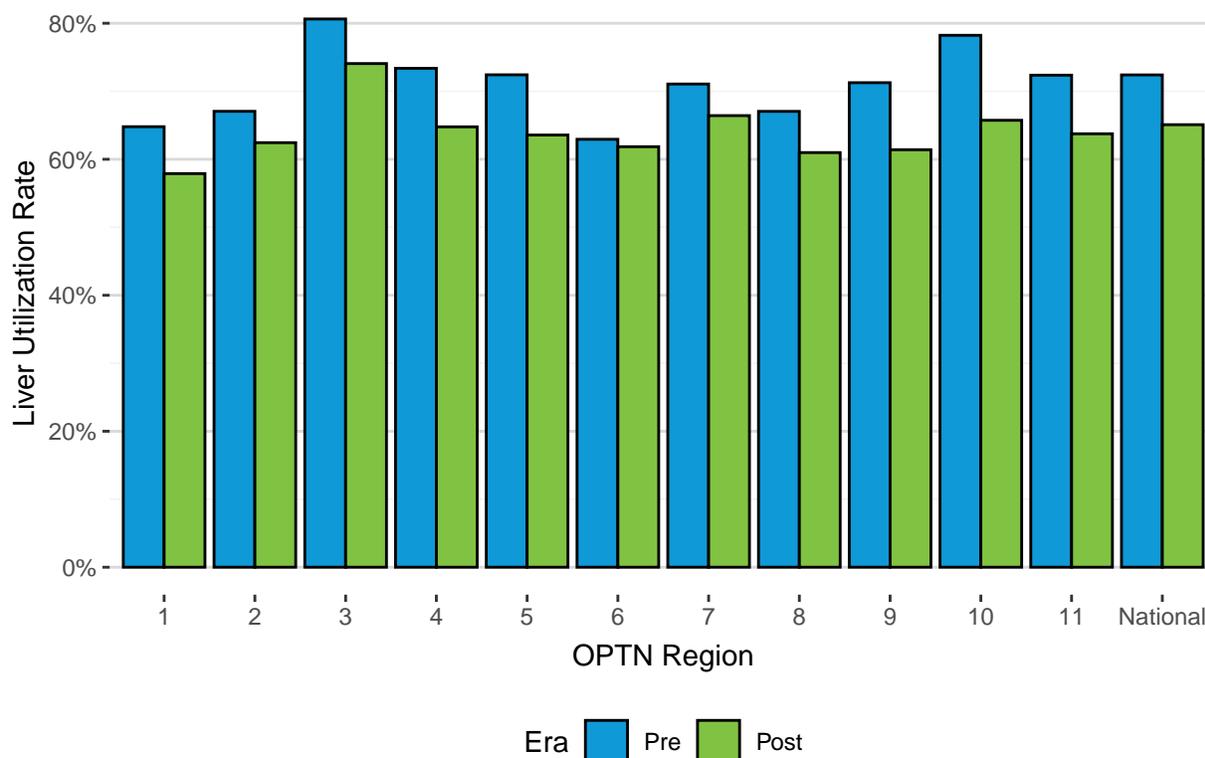
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 60. Liver Discard Rate by Donor Age and Era**

Donor Age Group	Pre-Policy	Post-Policy
	%	%
Pediatric (0-10 years)	5.07	5.00
Pediatric (11-17 years)	3.94	4.88
Adult (18-69 years)	9.26	9.69
Adult (70+ years)	12.78	14.88

Liver utilization rate is defined as the number of livers transplanted over the total number of organ donors recovered, multiplied by 100 to get a percentage. Nationally, the liver utilization rate decreased post-policy; this was similar for all OPTN regions as well.

**Figure 72. Liver Utilization Rate by OPTN Region and Era**



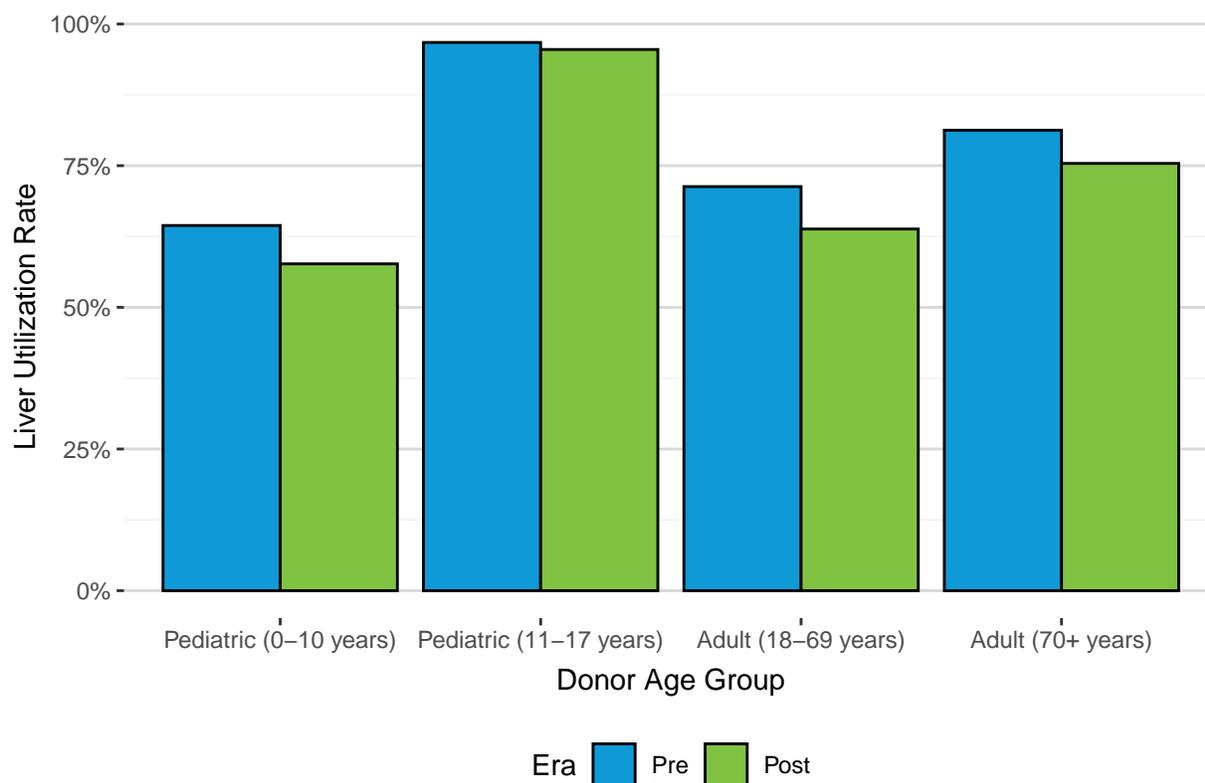
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 61. Liver Utilization Rate by OPTN Region and Era**

OPTN Region	Pre-Policy	Post-Policy
	%	%
1	64.79	57.89
2	67.05	62.44
3	80.63	74.07
4	73.37	64.77
5	72.42	63.56
6	62.94	61.84
7	71.07	66.42
8	67.04	60.98
9	71.26	61.40
10	78.23	65.73
11	72.37	63.75
National	72.40	65.08

There was a decrease in utilization rates post-policy across all age groups.

**Figure 73. Liver Utilization Rate by Donor Age and Era**



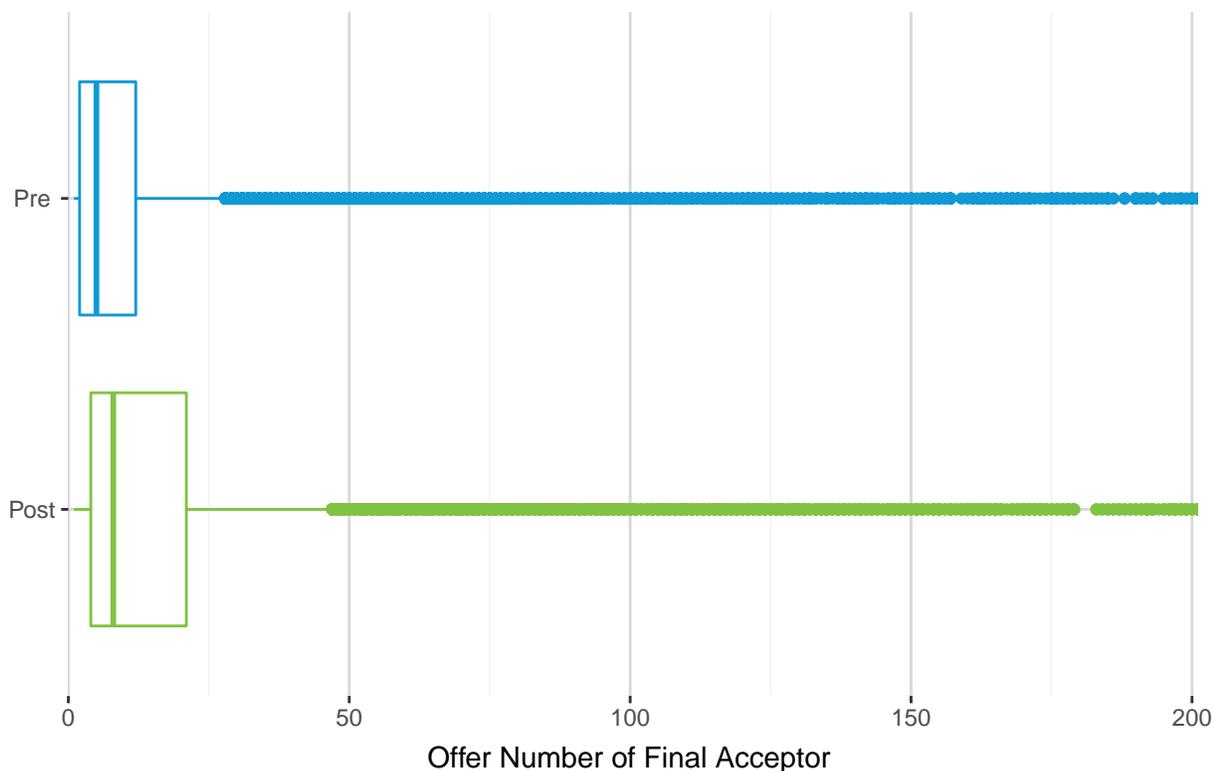
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 62. Liver Utilization Rate by Donor Age and Era**

Donor Age Group	Pre-Policy	Post-Policy
	%	%
Pediatric (0-10 years)	64.44	57.67
Pediatric (11-17 years)	96.74	95.50
Adult (18-69 years)	71.31	63.82
Adult (70+ years)	81.26	75.40

The distribution of the sequence number of the final acceptor on liver match runs is shown below. “Final acceptor” is used, as it is possible for two liver segments to be placed on the same match run; in these cases, the last of these is used if both segments are placed. Accepting candidate sequence number increased pre- to post-policy, as indicated by shifts in the first quartile, median, and 3rd quartile of the boxplot in the post-policy era. However, the median offer number of the final acceptor remained under 10.

**Figure 74. Distribution of Sequence Number of Final Acceptor on Liver Match Run by Era**



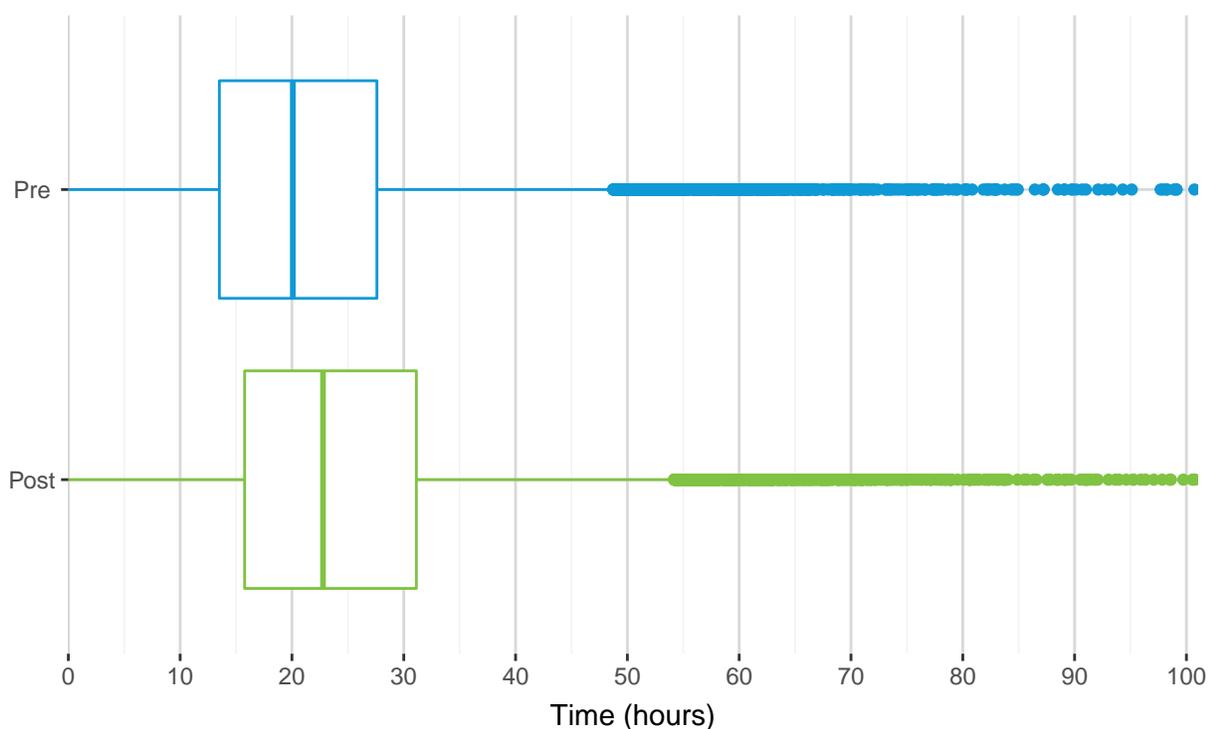
Offer Number of Final Acceptor  
 National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.  
 \*\* There were 1104 final acceptances pre-policy and 685 post-policy with an offer number >200.

**Table 63. Distribution of Sequence Number of Final Acceptor on Liver Match Run by Era**

Era	N Matches	Final Acceptor Sequence Number						
		Min	25th Percentile	Median	Mean	75th Percentile	90th Percentile	Max
Pre	16399	1	2	5	79	14	48	9951
Post	17265	1	4	9	105	26	96	7988

Median time from first electronic offer being sent to actual cross clamp time increased by roughly 2.7 hours pre- to post-policy.

**Figure 75. Distribution of Time from First Electronic Offer to Cross Clamp for Deceased Liver Donors by Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.

Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

\* There were 29 matches pre-policy and 22 post-policy with a time >100 hours that are not included.

\*\* There were 9 matches pre-policy and 22 post-policy with the first electronic offer prior to cross-clamp that are not included.

**Table 64. Distribution of Time from First Electronic Offer to Cross Clamp for Deceased Liver Donors by Era**

Era	N Matches	Time (Hours)					
		Minimum	25th Percentile	Median	Mean	75th Percentile	Maximum
Pre	20787	0.02	13.52	20.08	21.95	27.62	353.92
Post	23833	0.01	15.77	22.79	24.72	31.17	366.40

## Section V. Intestine

There were 247 intestine candidates added to the waiting list pre-policy and 290 post-policy. A little under 40% of these waitlist additions were listed for intestine only pre- and post-policy.

**Table 65. Number of Intestine Waitlist Additions by Multi-Organ Type and Era**

Multi-Organ Type	Pre-Policy	Post-Policy
Intestine Only	92 (37.2%)	113 (39.0%)
Intestine-Kidney	9 (3.6%)	3 (1.0%)
Intestine-Kidney-Pancreas	1 (0.4%)	2 (0.7%)
Intestine-Liver	1 (0.4%)	5 (1.7%)
Intestine-Liver-Kidney-Pancreas	17 (6.9%)	13 (4.5%)
Intestine-Liver-Pancreas	113 (45.7%)	134 (46.2%)
Intestine-Pancreas	12 (4.9%)	16 (5.5%)
Intestine-VCA	2 (0.8%)	4 (1.4%)
Total	247 (100.0%)	290 (100.0%)

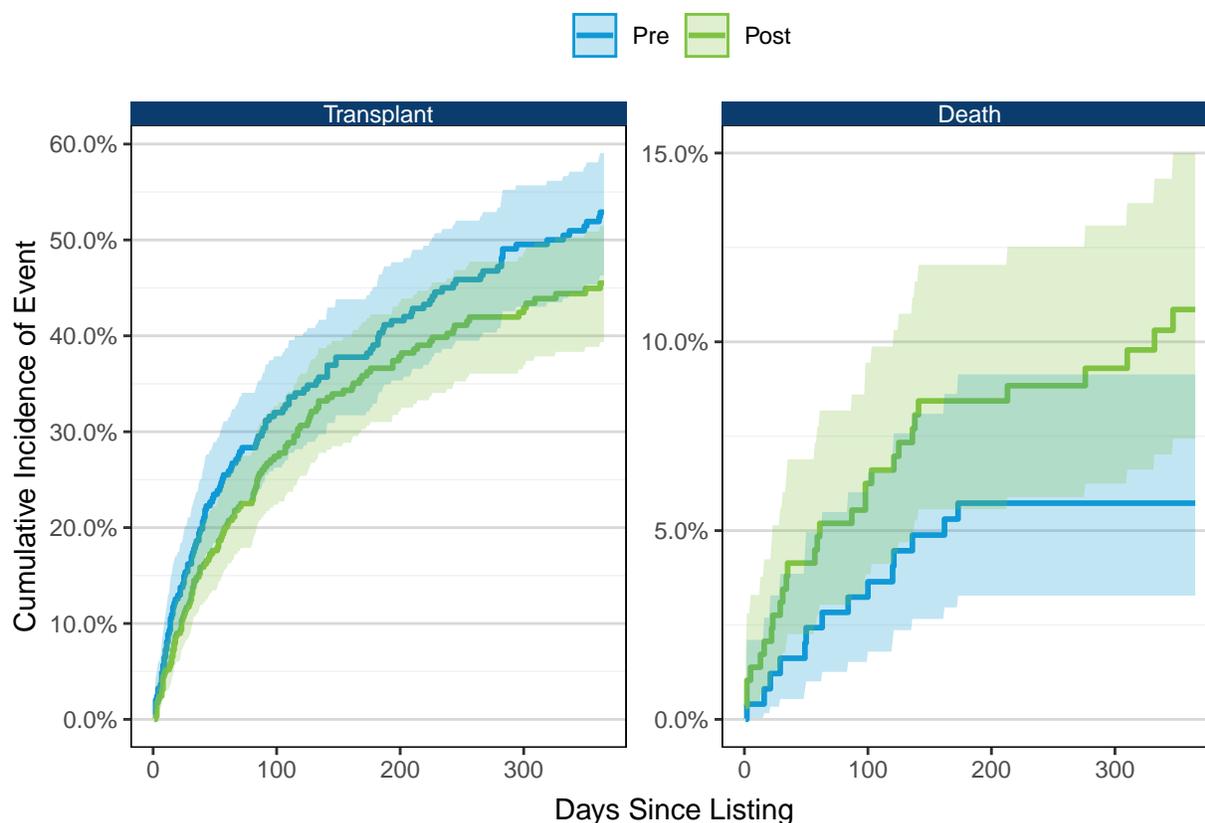
The number of intestine registrations removed for death or too sick remained similar pre- (39) and post-policy (40). Few intestine-alone registrations were removed in the pre-policy era (8) or post-policy era (5) due to death or too sick to transplant.

**Table 66. Number of Intestine Registrations Removed for Death or Too Sick by Multi-Organ Type and Era**

Multi-Organ Type	Pre-Policy	Post-Policy
Intestine Only	8 (20.5%)	5 (12.5%)
Intestine-Kidney	2 (5.1%)	2 (5.0%)
Intestine-Kidney-Pancreas	1 (2.6%)	0 (0.0%)
Intestine-Liver	0 (0.0%)	1 (2.5%)
Intestine-Liver-Kidney-Pancreas	8 (20.5%)	6 (15.0%)
Intestine-Liver-Pancreas	17 (43.6%)	24 (60.0%)
Intestine-Pancreas	2 (5.1%)	2 (5.0%)
Intestine-VCA	1 (2.6%)	0 (0.0%)
Total	39 (100.0%)	40 (100.0%)

The following figure shows the cumulative incidence of transplant on the left and the cumulative incidence of removal from the waitlist for death or too sick on the right. The probability of intestine transplant is lower post-policy, but these differences are not statistically significant. The probability of removal for death or too sick is higher post-policy, but these differences are not statistically significant.

**Figure 76. Cumulative Incidence of Event for Intestine Waitlist Additions by Era**



**Table 67. Cumulative Incidence of Event for Intestine Waitlist Additions by Era**

Outcome	Policy Era	90 Days		180 Days		365 Days	
		Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
Transplant	Pre	30.4%	(24.7%, 36.2%)	39.0%	(32.9%, 45.1%)	52.9%	(46.3%, 59.1%)
	Post	26.4%	(21.4%, 31.6%)	36.6%	(31.0%, 42.2%)	45.5%	(39.3%, 51.4%)
Death	Pre	3.2%	(1.5%, 6.0%)	5.7%	(3.3%, 9.1%)	5.7%	(3.3%, 9.1%)
	Post	5.5%	(3.3%, 8.6%)	8.4%	(5.6%, 12.0%)	10.9%	(7.4%, 15.0%)

A total of 201 deceased intestine donors were recovered pre-policy and 191 were recovered post-policy. The same number of deceased donor intestine transplants occurred pre- and post-policy (185 pre- and 185 post-policy). Note that this includes all deceased donor intestine recipients - intestine-alone as well as intestine multi-organ. The following table illustrates the distribution of intestine-alone versus intestine multi-organ transplants in each policy era. There was a larger proportion of intestine only transplants post-policy compared to pre-policy.

**Table 68. Number of Deceased Donor Intestine Transplants by Multi-Organ Type and Era**

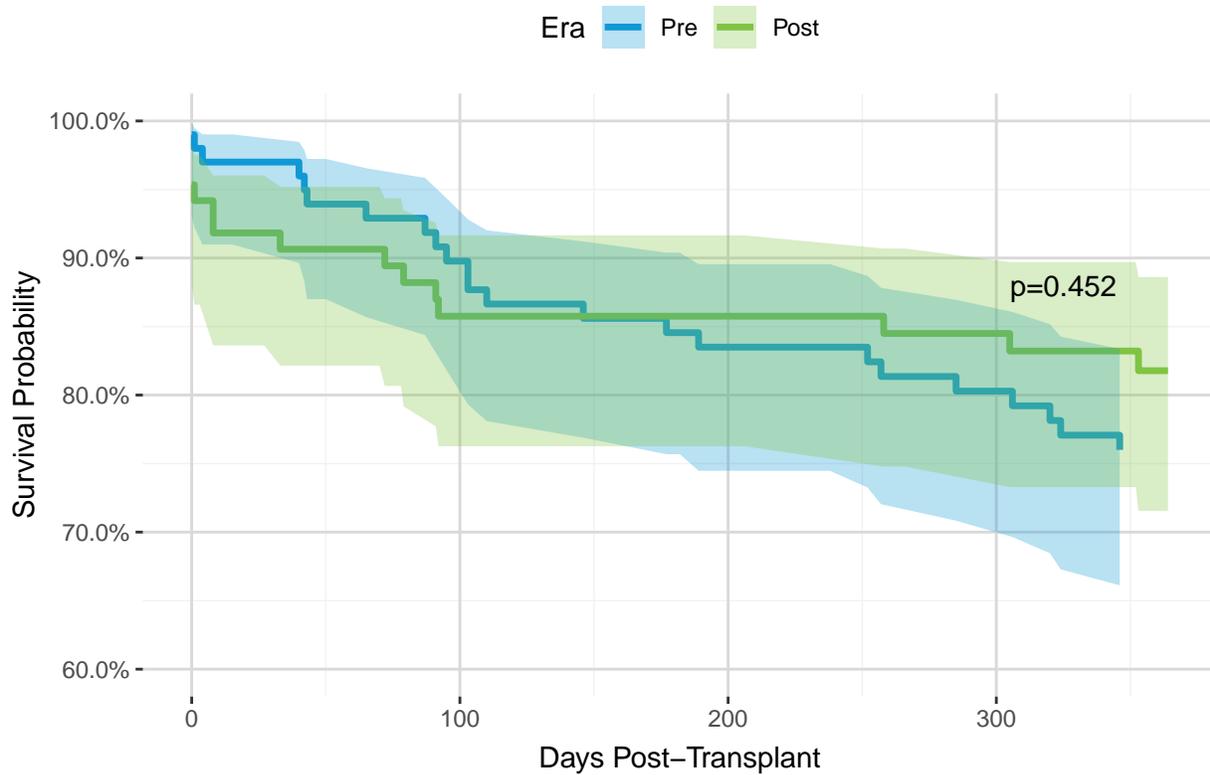
Multi-Organ Type	Pre-Policy	Post-Policy
Intestine Only	72 (38.9%)	88 (47.6%)
Intestine-Kidney	5 (2.7%)	4 (2.2%)
Intestine-Kidney-Pancreas	0 (0.0%)	1 (0.5%)
Intestine-Liver	3 (1.6%)	0 (0.0%)
Intestine-Liver-Kidney-Pancreas	11 (5.9%)	8 (4.3%)
Intestine-Liver-Pancreas	85 (45.9%)	70 (37.8%)
Intestine-Pancreas	8 (4.3%)	14 (7.6%)
Intestine-VCA	1 (0.5%)	0 (0.0%)
Total	185 (100.0%)	185 (100.0%)

The distributions of intestine transplants by classification distance groups were similar between the policy eras.

**Table 69. Number of Deceased Donor Intestine Transplants by Classification Distance and Era**

Classification Distance	Pre-Policy	Post-Policy
0-150 NM	43 (23.2%)	47 (25.4%)
>150-250 NM	18 (9.7%)	11 (5.9%)
>250-500 NM	45 (24.3%)	50 (27.0%)
>500 NM	79 (42.7%)	77 (41.6%)
Total	185 (100.0%)	185 (100.0%)

**Figure 77. One Year Post-Transplant Patient Survival Curves for All Intestine Recipients by Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 70. One Year Post-Transplant Patient Survival Estimates for All Intestine Recipients by Era**

Era	N At Risk	Survival Probability	
		Estimate	95% CI
Pre	72	76.0%	(66.1%, 83.4%)
Post	51	81.8%	(71.6%, 88.6%)

One year patient survival for all intestine recipients showed no statistically significant difference between pre- and post-policy eras (p=0.452). The probability of survival at one year post-transplant was 76.0% and 81.8%, pre- and post-policy, respectively.

## Conclusion

This report provides a review of the first two years of acuity circle allocation changes. A national state of emergency was declared due to COVID-19 on March 13, 2020, making the true impact of this policy change challenging to determine. While changes pre- to post-policy must be considered in light of this national emergency, many of the results thus far are consistent with the predictions of the SRTR modeling prior to implementation of the acuity circle allocation policy. Takeaways at a national-level of these policy changes are as follows.

Generally the waitlist has remained consistent with regards to characteristics of new additions pre- to post-policy. There was an increase in adult waitlist additions with an alcohol-related liver disease post-policy. Although there were more adult waitlist additions overall post-policy, there were fewer pediatric waitlist additions, particularly in the 0-2 year old age group.

Overall, waitlist mortality rates per 100 person-years increased post-policy in the MELD/PELD 29-32, MELD/PELD 33-36, and MELD/PELD 37+ groups despite fewer death or too sick events post-policy, likely due to the smaller number of candidates in these groups. Conversely, transplant rates per 100 active person-years increased in the MELD <15, MELD/PELD 29-32, MELD/PELD 33-36, MELD/PELD 37+, and Status 1 groups, indicating that more patients are being transplanted more quickly post-policy. Despite an increase in waitlist mortality for some groups, the number of adult and pediatric liver-alone registrations for death or too sick decreased post-policy compared to pre-policy.

There was an increase in the number of adult deceased donor liver-alone transplants post-policy. The national median allocation MELD score at transplant remained consistent at 28 pre- and post-policy, and there were fewer HCC exception and non-HCC exception transplants post-policy. There were more DCD transplants post-policy, particularly for recipients with MELD scores of 28 or lower. There was a decrease in the proportion of livers traveling within 150 NMs and an increase in the proportion of livers traveling between 250 and 500 NMs. Despite an increase in distance, median cold ischemia time only increased by about 10 minutes.

The number of pediatric liver-alone deceased donor transplants decreased post-policy compared to pre-policy corresponding with a decrease in pediatric waitlist additions. There was a substantial decrease in the proportion and volume of MELD/PELD 37-40, MELD/PELD >40, Status 1A and 1B transplants and an increase in the proportion and volume of 12-17 year old transplant recipients. There were fewer transplants in the 0-2 year old age group, perhaps corresponding with the decrease in 0-2 year old waitlist additions. Similar to adult transplants, there was a decrease in pediatric transplants of livers traveling less than 150 NMs and an increase in livers traveling greater than 250 NMs. Median cold ischemia time for pediatric transplants increased by roughly 27 minutes post-policy.

There was an increase in simultaneous liver-kidney multi-organ transplants post-policy. However, liver-alone transplants still make up about 90% of all liver transplants. One year post-transplant survival decreased slightly post-policy, although changes were not statistically significant. While offer rates increased across all MELD or PELD score/status groups, age groups, and race/ethnicity groups, this was by varying degrees. The national discard rate remained similar pre- and post-policy and the liver utilization rate decreased nationally as well as in all regions.

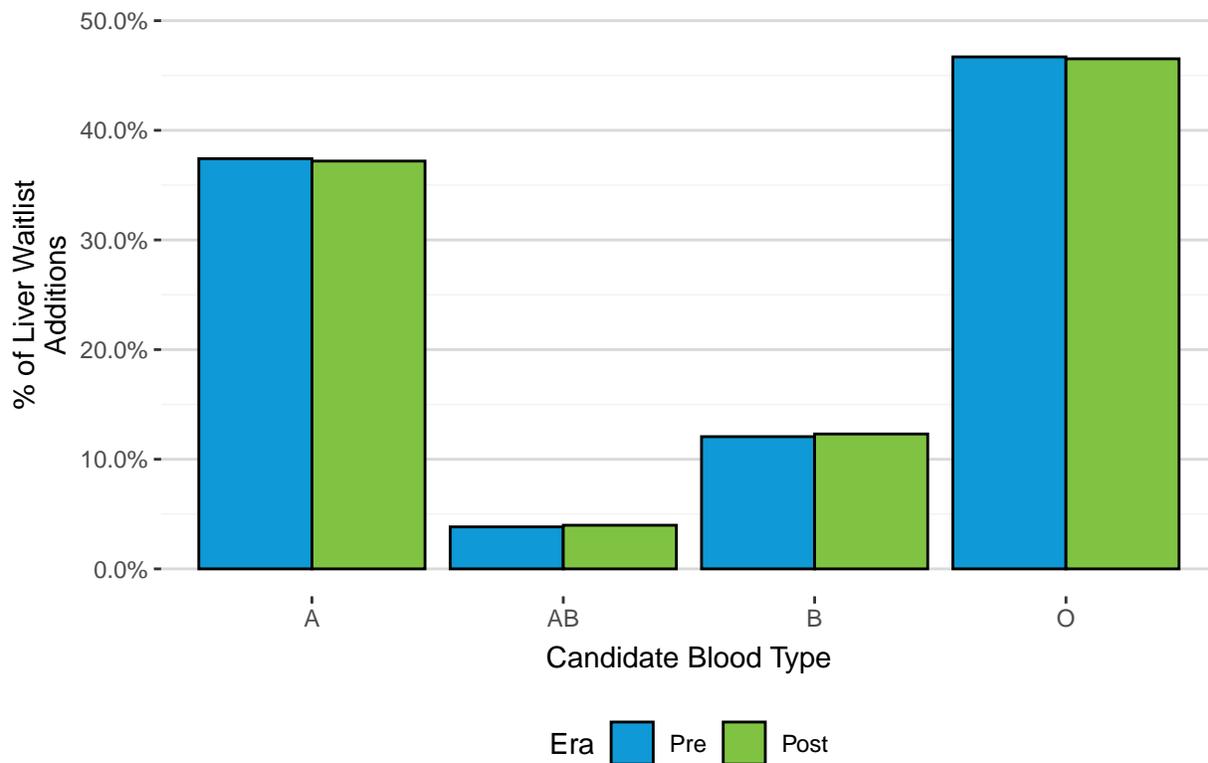
Intestine transplantation remained stable during this policy change with a similar number of intestine registrations removed for death or too sick post-policy and the same number of intestine transplants performed pre- and post-policy. The distribution of intestine transplants by classification distance groups remained similar between the policy eras.

The COVID-19 crisis has created challenges in many sectors, but particularly the medical field. Specific to transplantation, changes in potential patient evaluation, organ procurement, and transplant recipient selection process, as well as acceptance behaviors and routine outpatient activities, including clinical testing, have made it difficult to parse out COVID-19 from potential policy effects.

## Appendix

### Additional Waitlist Registration Additions Information

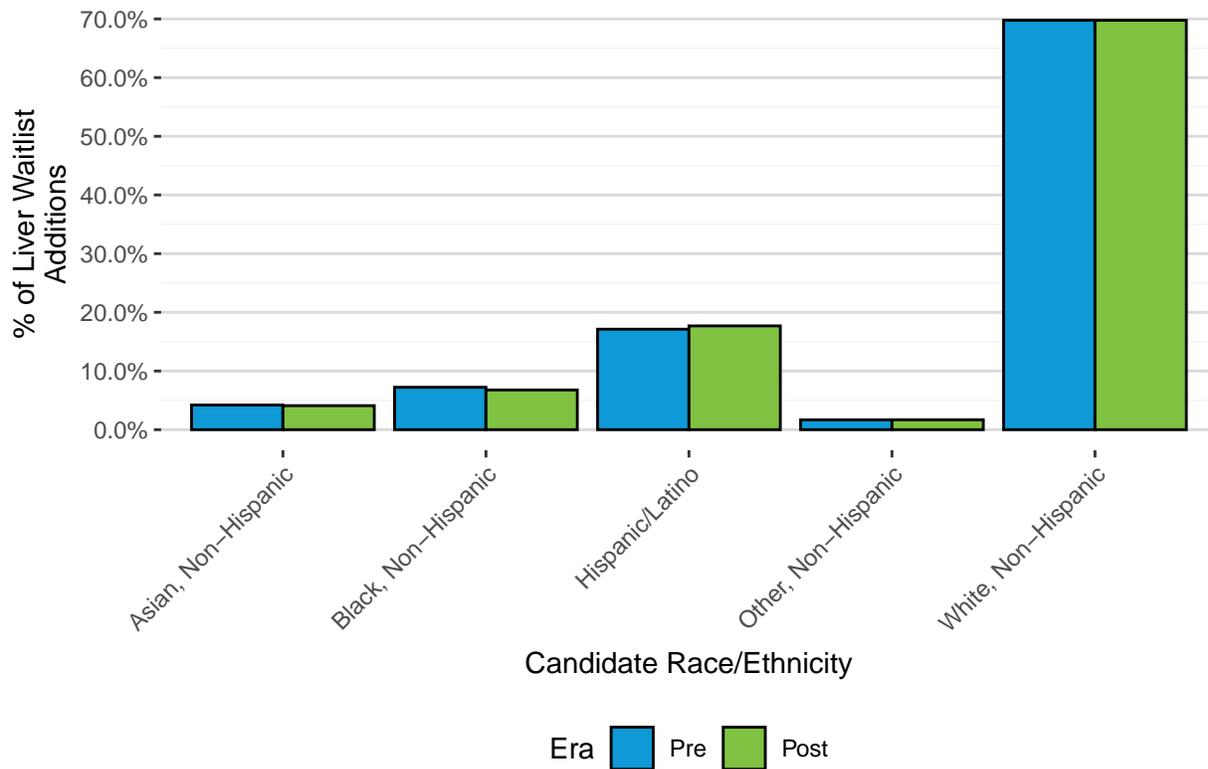
Figure 78. Adult Registrations Added to Liver Waitlist by Candidate Blood Type and Era



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

Table 71. Number and Percent of Adult Registrations Added to Liver Waitlist by Candidate Blood Type and Era

Candidate Blood Type	Pre-Policy	Post-Policy
A	9406 (37.4%)	9522 (37.2%)
AB	963 (3.8%)	1019 (4.0%)
B	3032 (12.1%)	3150 (12.3%)
O	11739 (46.7%)	11910 (46.5%)
Total	25140 (100.0%)	25601 (100.0%)

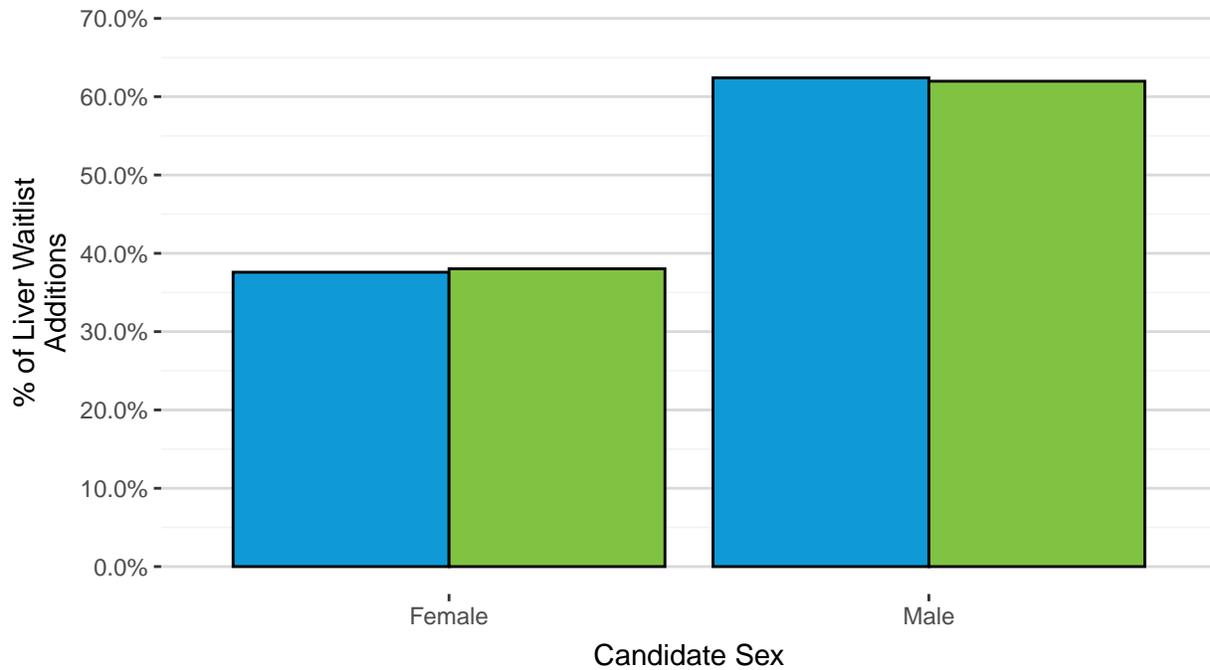
**Figure 79. Adult Registrations Added to Liver Waitlist by Candidate Race/Ethnicity and Era**

National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 72. Number and Percent of Adult Registrations Added to Liver Waitlist by Candidate Race/Ethnicity and Era**

Candidate Race/Ethnicity	Pre-Policy	Post-Policy
Asian, Non-Hispanic	1056 (4.2%)	1048 (4.1%)
Black, Non-Hispanic	1816 (7.2%)	1733 (6.8%)
Hispanic/Latino	4305 (17.1%)	4528 (17.7%)
Other, Non-Hispanic	421 (1.7%)	432 (1.7%)
White, Non-Hispanic	17542 (69.8%)	17860 (69.8%)
Total	25140 (100.0%)	25601 (100.0%)

**Figure 80. Adult Registrations Added to Liver Waitlist by Candidate Sex and Era**

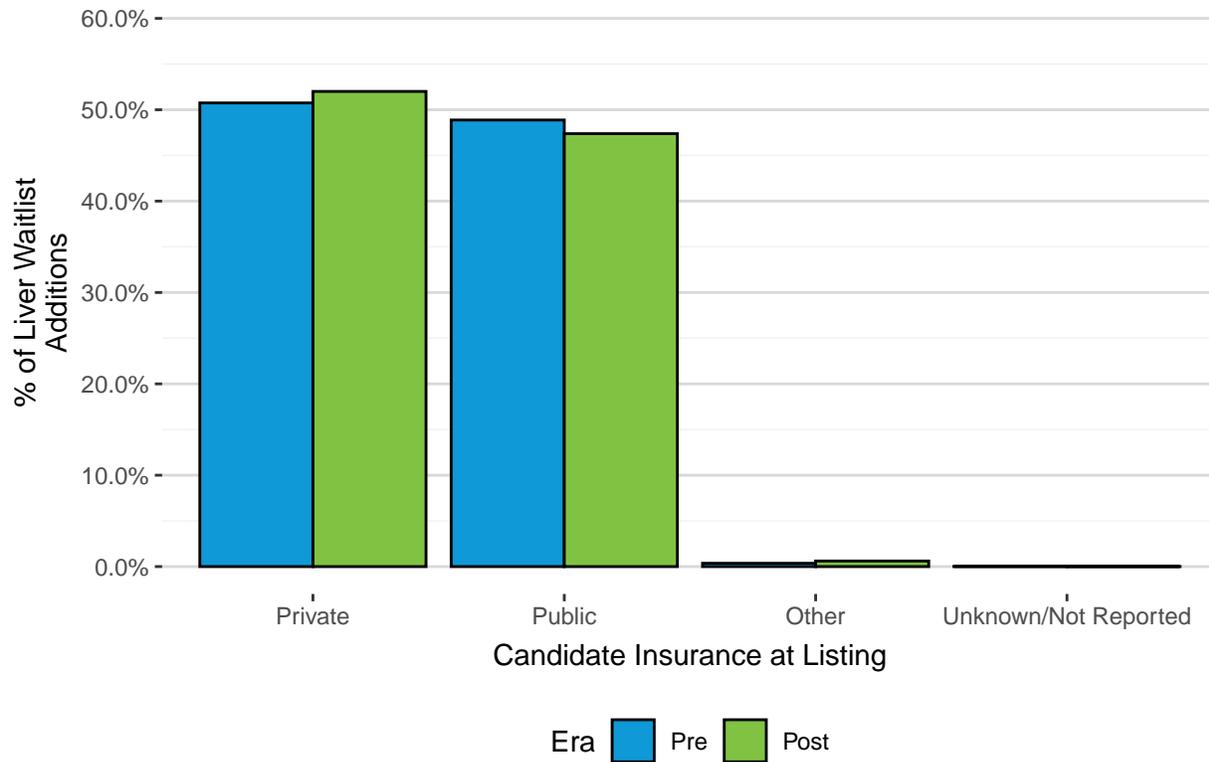


Era ■ Pre ■ Post

National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 73. Number and Percent of Adult Registrations Added to Liver Waitlist by Candidate Sex and Era**

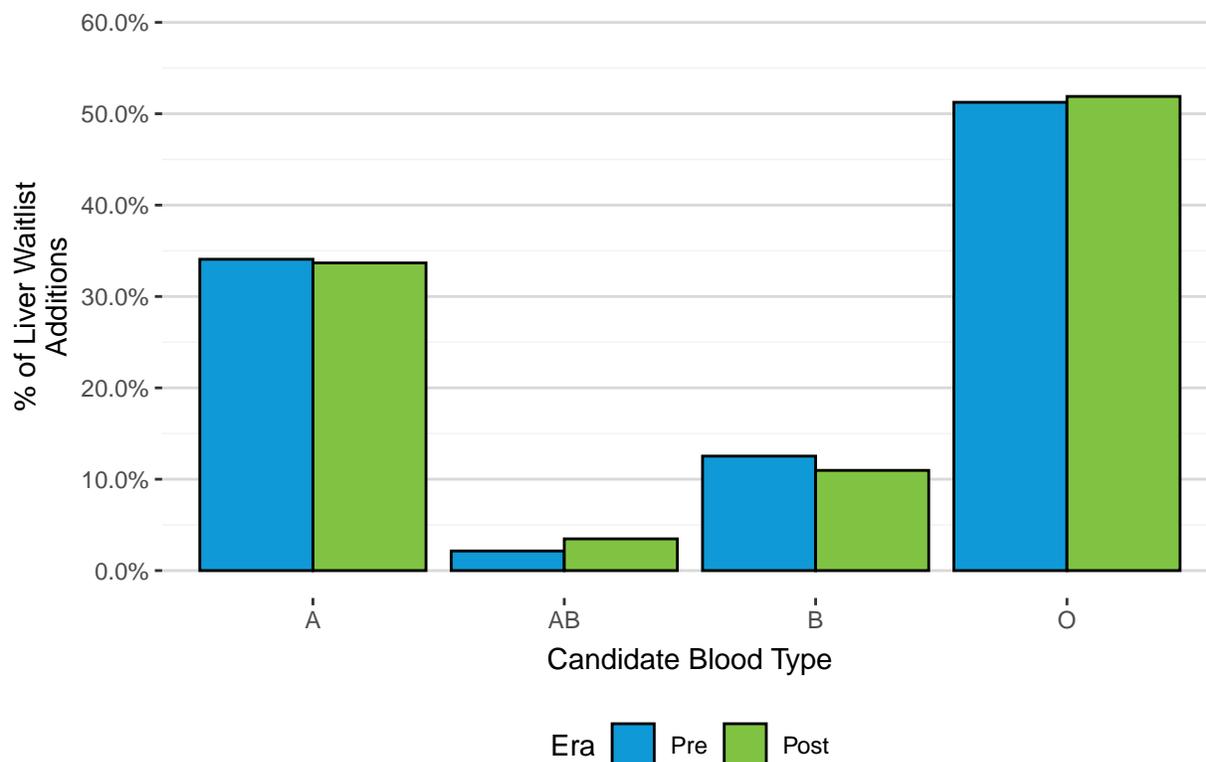
Candidate Sex	Pre-Policy	Post-Policy
Female	9449 (37.6%)	9735 (38.0%)
Male	15691 (62.4%)	15866 (62.0%)
Total	25140 (100.0%)	25601 (100.0%)

**Figure 81. Adult Registrations Added to Liver Waitlist by Candidate Insurance at Listing and Era**

National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 74. Number and Percent of Adult Registrations Added to Liver Waitlist by Candidate Insurance at Listing and Era**

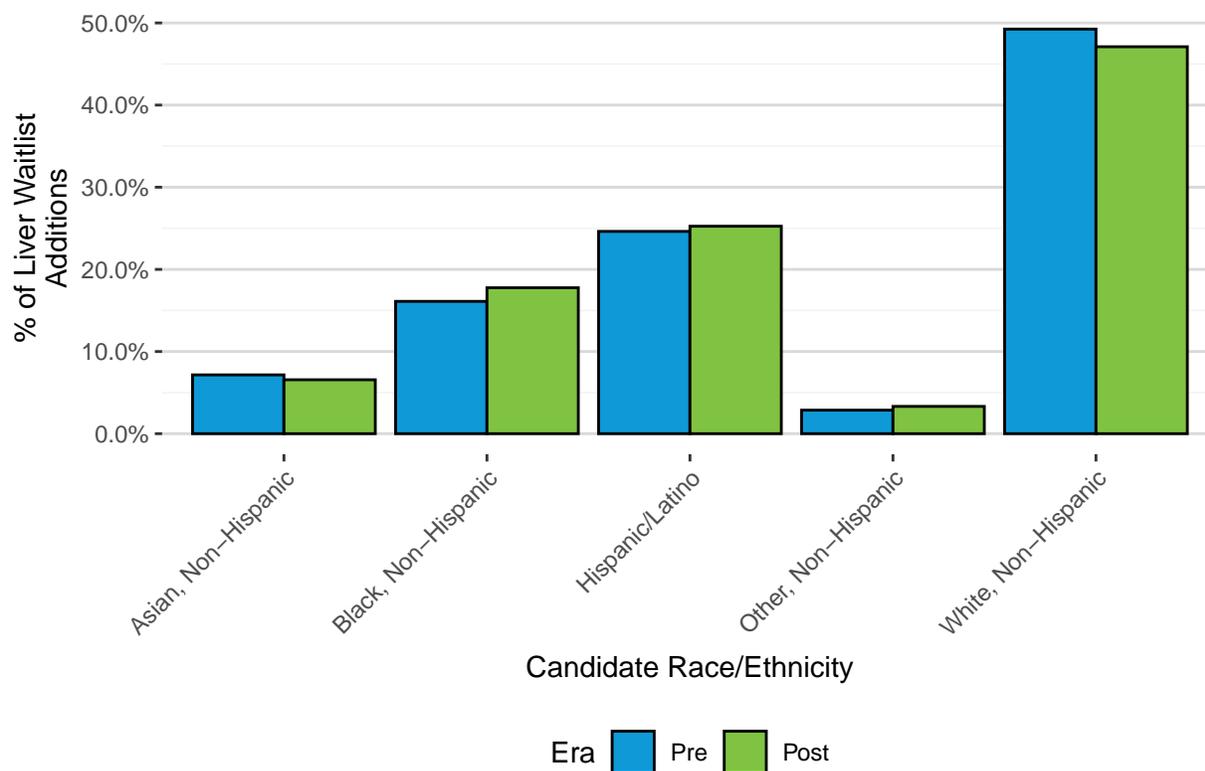
Candidate Insurance at Listing	Pre-Policy	Post-Policy
Private	12757 (50.7%)	13313 (52.0%)
Public	12287 (48.9%)	12130 (47.4%)
Other	91 (0.4%)	156 (0.6%)
Unknown/Not Reported	5 (0.0%)	2 (0.0%)
Total	25140 (100.0%)	25601 (100.0%)

**Figure 82. Pediatric Registrations Added to Liver Waitlist by Candidate Blood Type and Era**

National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 75. Number and Percent of Pediatric Registrations Added to Liver Waitlist by Candidate Blood Type and Era**

Candidate Blood Type	Pre-Policy	Post-Policy
A	476 (34.1%)	436 (33.7%)
AB	30 (2.1%)	45 (3.5%)
B	175 (12.5%)	142 (11.0%)
O	716 (51.3%)	672 (51.9%)
Total	1397 (100.0%)	1295 (100.0%)

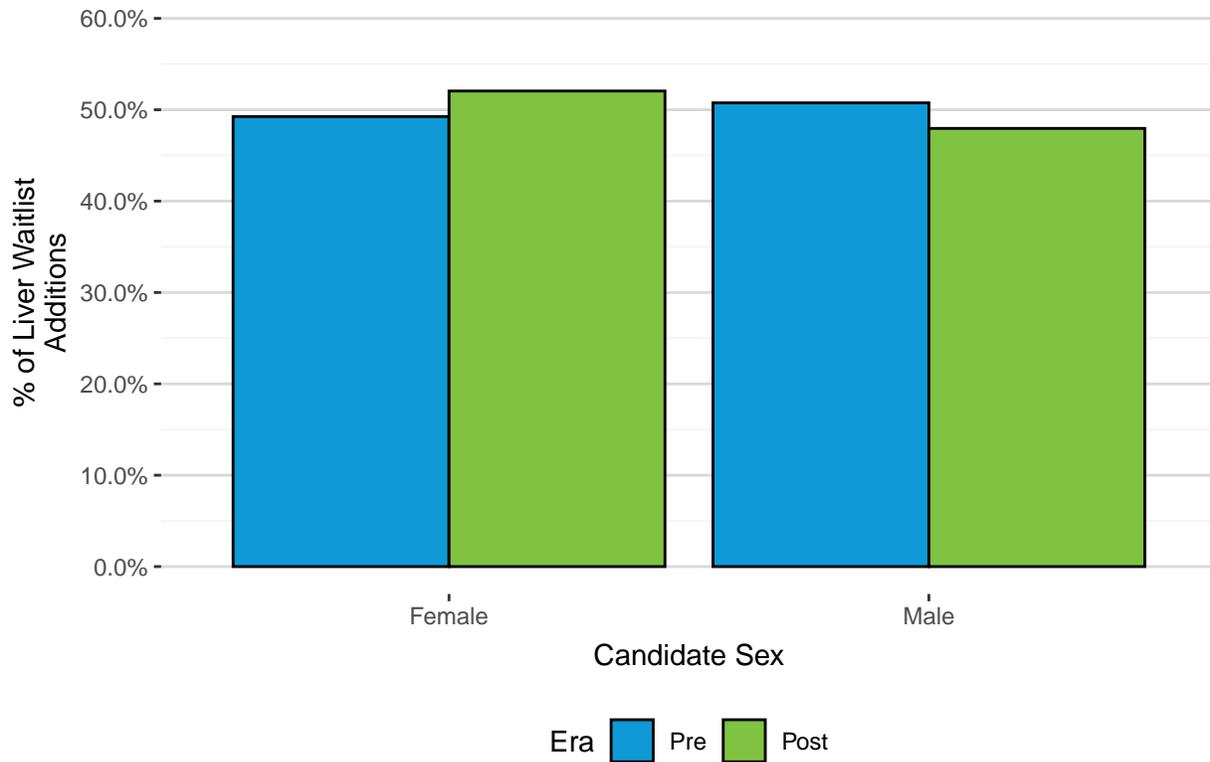
**Figure 83. Pediatric Registrations Added to Liver Waitlist by Candidate Race/Ethnicity and Era**

National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 76. Number and Percent of Pediatric Registrations Added to Liver Waitlist by Candidate Race/Ethnicity and Era**

Candidate Race/Ethnicity	Pre-Policy	Post-Policy
Asian, Non-Hispanic	100 (7.2%)	85 (6.6%)
Black, Non-Hispanic	225 (16.1%)	230 (17.8%)
Hispanic/Latino	344 (24.6%)	327 (25.3%)
Other, Non-Hispanic	40 (2.9%)	43 (3.3%)
White, Non-Hispanic	688 (49.2%)	610 (47.1%)
Total	1397 (100.0%)	1295 (100.0%)

**Figure 84. Pediatric Registrations Added to Liver Waitlist by Candidate Sex and Era**

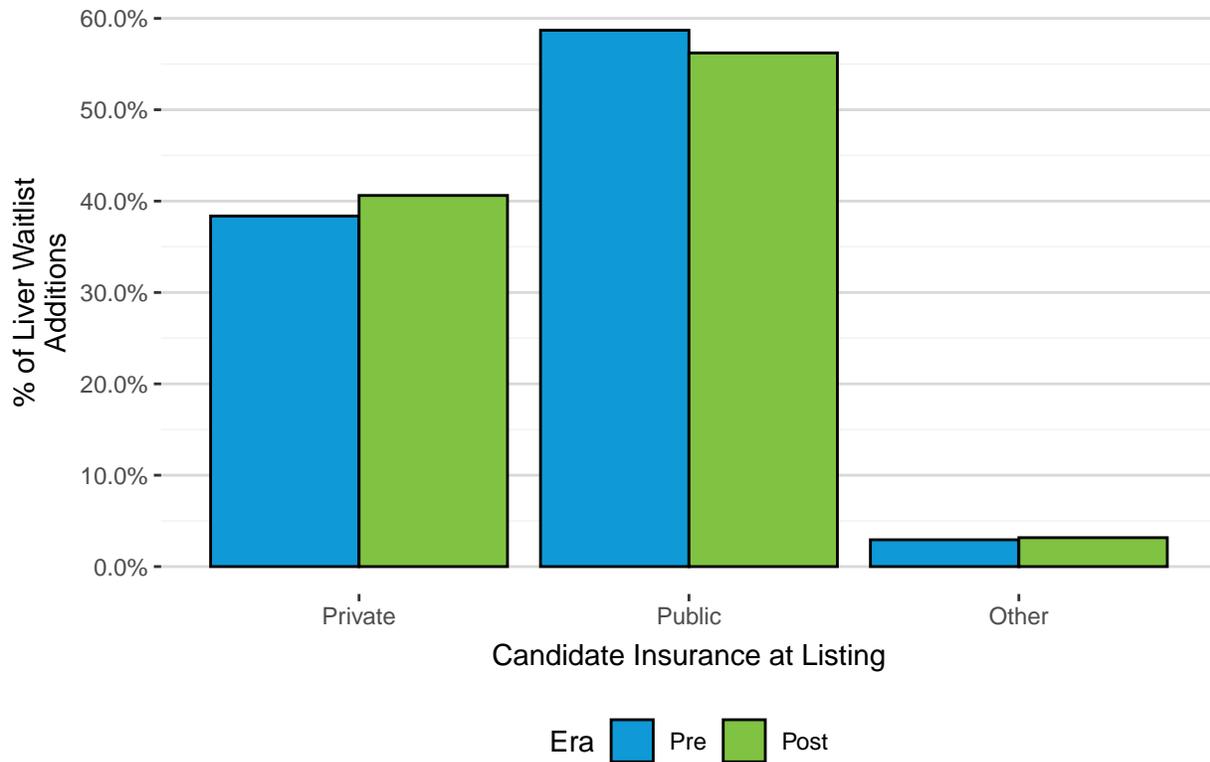


National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 77. Number and Percent of Pediatric Registrations Added to Liver Waitlist by Candidate Sex and Era**

Candidate Sex	Pre-Policy	Post-Policy
Female	688 (49.2%)	674 (52.0%)
Male	709 (50.8%)	621 (48.0%)
Total	1397 (100.0%)	1295 (100.0%)

**Figure 85. Pediatric Registrations Added to Liver Waitlist by Candidate Insurance at Listing and Era**



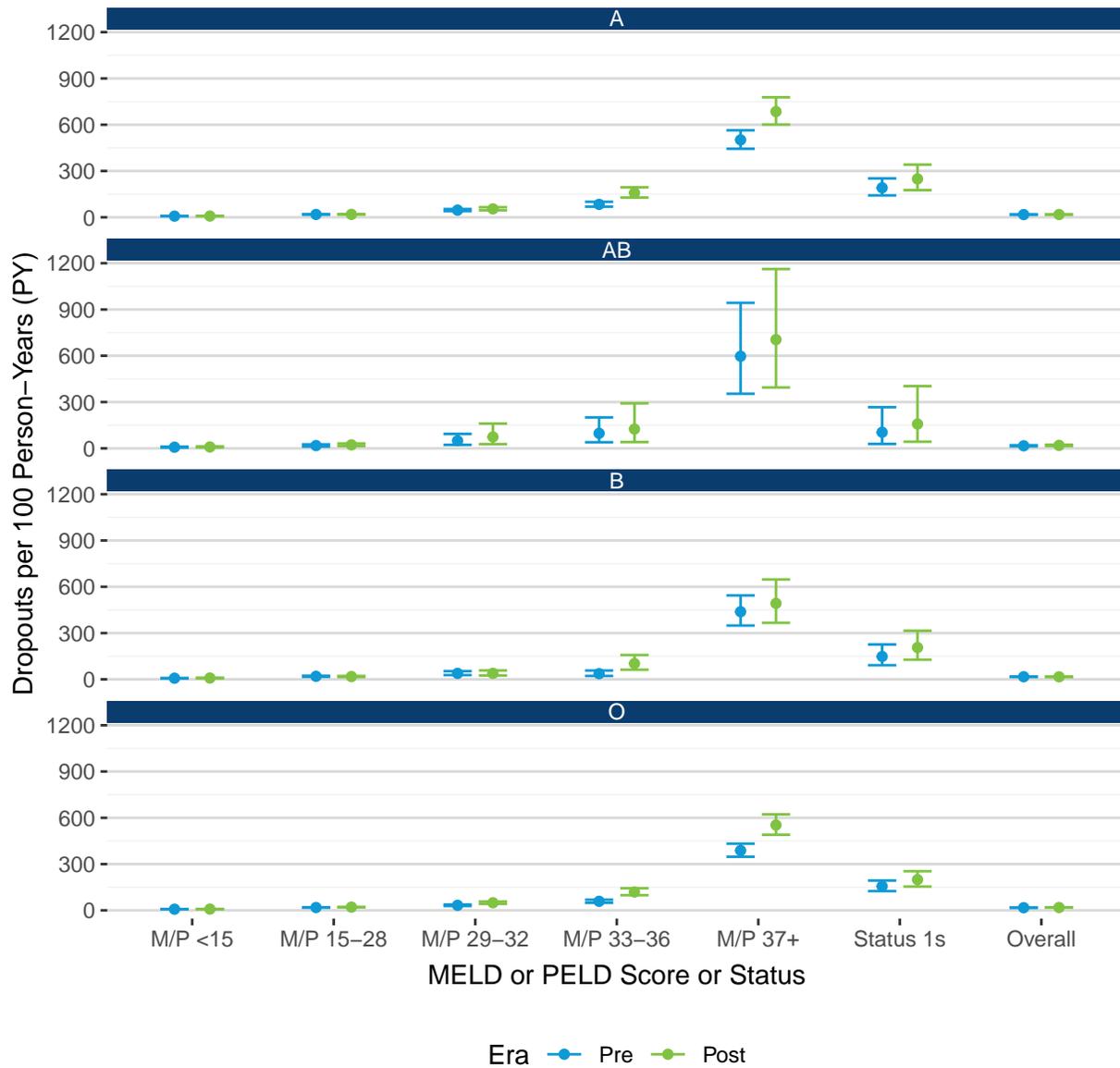
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 78. Number and Percent of Pediatric Registrations Added to Liver Waitlist by Candidate Insurance at Listing and Era**

Candidate Insurance at Listing	Pre-Policy	Post-Policy
Private	536 (38.4%)	526 (40.6%)
Public	820 (58.7%)	728 (56.2%)
Other	41 (2.9%)	41 (3.2%)
Total	1397 (100.0%)	1295 (100.0%)

### Additional Waitlist Removal Rates Information

**Figure 86. Liver-Along Waitlist Rates of Removal Due to Death or Too Sick Per 100 Person-Years Waiting by MELD or PELD Score or Status, Candidate ABO, and Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

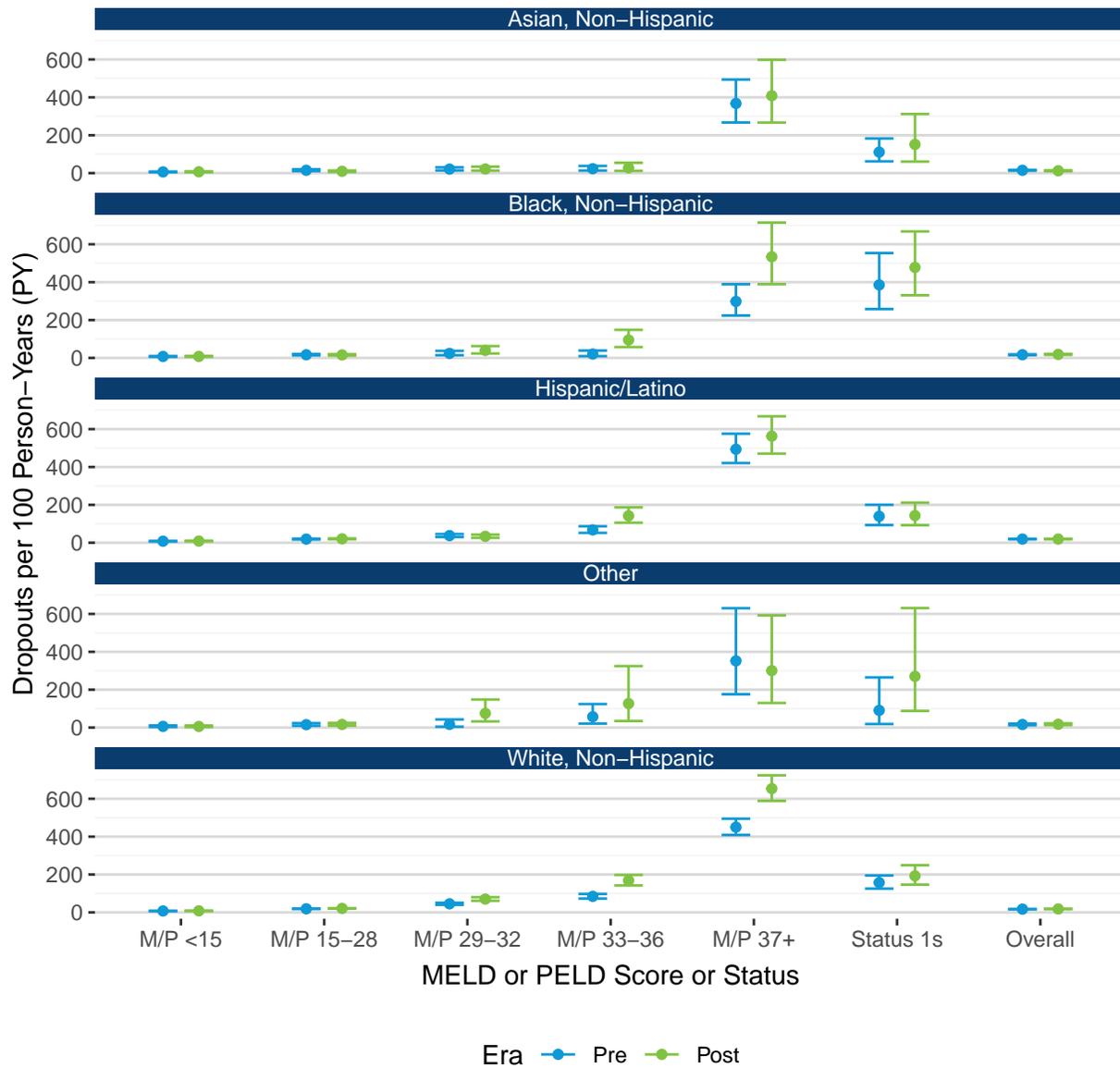
**Table 79. Liver-Along Waitlist Rates of Removal Due to Death or Too Sick Per 100 Person-Years Waiting by MELD or PELD Score or Status, Candidate ABO, and Era**

Candidate ABO	Score or Status Group	Era	Ever Waiting	Death/ Too Sick Events	Person- Years	Dropouts per 100 PY	
			N	N	PY	Estimate	95% CI
A	M/P <15	Pre	8106	392	5259.1	7.45	6.73, 8.23
		Post	7383	376	4730.0	7.95	7.17, 8.79
	M/P 15-28	Pre	7993	604	3284.2	18.39	16.95, 19.92
		Post	7553	617	3258.7	18.93	17.47, 20.49
	M/P 29-32	Pre	2815	182	393.3	46.27	39.79, 53.50
		Post	2241	121	221.7	54.59	45.30, 65.23
	M/P 33-36	Pre	1436	112	134.0	83.58	68.82, 100.57
		Post	1257	93	58.7	158.46	127.90, 194.12
	M/P 37+	Pre	1316	278	55.4	501.56	444.33, 564.12
		Post	1331	239	34.9	685.32	601.19, 777.94
	Status 1s	Pre	411	50	26.2	191.10	141.84, 251.94
		Post	342	38	15.3	248.61	175.93, 341.24
	Overall	Pre	13020	1624	9235.6	17.58	16.74, 18.46
		Post	12792	1500	8398.3	17.86	16.97, 18.79
AB	M/P <15	Pre	633	27	372.4	7.25	4.78, 10.55
		Post	563	27	310.1	8.71	5.74, 12.67
	M/P 15-28	Pre	646	26	147.9	17.57	11.48, 25.75
		Post	646	33	146.9	22.47	15.47, 31.56
	M/P 29-32	Pre	175	9	18.3	49.27	22.53, 93.52
		Post	158	6	8.1	73.71	27.05, 160.44
	M/P 33-36	Pre	128	7	7.2	97.26	39.10, 200.39
		Post	86	5	4.0	125.00	40.59, 291.71
	M/P 37+	Pre	105	18	3.0	596.73	353.66, 943.09
		Post	109	15	2.1	704.63	394.38, 1162.19
	Status 1s	Pre	41	4	3.8	104.14	28.37, 266.63
		Post	41	4	2.5	157.50	42.91, 403.26
	Overall	Pre	1151	92	564.4	16.30	13.14, 19.99
		Post	1159	92	484.7	18.98	15.30, 23.28
	M/P <15	Pre	2424	115	1572.3	7.31	6.04, 8.78
		Post	2123	118	1395.2	8.46	7.00, 10.13
	M/P 15-28	Pre	2356	152	775.6	19.60	16.61, 22.97
		Post	2174	124	682.9	18.16	15.10, 21.65

*(continued)*

Candidate ABO	Score or Status Group	Era	N	N	PY	Estimate	95% CI	
B	M/P 29-32	Pre	752	40	103.1	38.80	27.72, 52.84	
		Post	593	24	62.0	38.69	24.79, 57.57	
	M/P 33-36	Pre	392	19	52.0	36.57	22.02, 57.11	
		Post	364	20	19.6	102.16	62.40, 157.77	
	M/P 37+	Pre	410	82	18.7	438.47	348.73, 544.26	
		Post	384	51	10.4	492.33	366.57, 647.32	
	Status 1s	Pre	145	21	14.2	147.89	91.54, 226.06	
		Post	135	21	10.2	205.99	127.51, 314.88	
	Overall	Pre	4046	430	2555.4	16.83	15.27, 18.50	
		Post	3886	362	2208.2	16.39	14.75, 18.17	
	O	M/P <15	Pre	10160	512	6506.1	7.87	7.20, 8.58
			Post	9186	495	5915.1	8.37	7.65, 9.14
M/P 15-28		Pre	9714	735	3950.2	18.61	17.29, 20.00	
		Post	9306	820	3865.2	21.22	19.79, 22.72	
M/P 29-32		Pre	3520	186	566.9	32.81	28.26, 37.88	
		Post	2822	177	358.6	49.36	42.36, 57.20	
M/P 33-36		Pre	1972	145	246.3	58.87	49.68, 69.27	
		Post	1713	113	94.7	119.31	98.33, 143.45	
M/P 37+		Pre	1689	330	85.0	388.21	347.45, 432.44	
		Post	1623	277	50.1	553.24	490.00, 622.38	
Status 1s		Pre	584	85	54.3	156.44	124.96, 193.44	
		Post	531	66	33.1	199.45	154.26, 253.75	
Overall		Pre	16166	2011	11571.4	17.38	16.63, 18.16	
		Post	16018	1964	10480.0	18.74	17.92, 19.59	

**Figure 87. Liver-Alone Waitlist Rates of Removal Due to Death or Too Sick Per 100 Person-Years Waiting by MELD or PELD Score or Status, Candidate Race/Ethnicity, and Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 80. Liver-Along Waitlist Rates of Removal Due to Death or Too Sick Per 100 Person-Years Waiting by MELD or PELD Score or Status, Candidate Race/Ethnicity, and Era**

Candidate Race/Ethnicity	Score or Status Group	Era	Ever Waiting	Death/ Too Sick Events	Person- Years	Dropouts per 100 PY		
			N	N	PY	Estimate	95% CI	
Asian, Non-Hispanic	M/P <15	Pre	1094	48	758.3	6.33	4.67, 8.39	
		Post	922	42	609.6	6.89	4.97, 9.31	
	M/P 15-28	Pre	770	43	288.3	14.91	10.79, 20.09	
		Post	745	33	341.1	9.67	6.66, 13.59	
	M/P 29-32	Pre	443	27	127.6	21.15	13.94, 30.78	
		Post	329	19	87.2	21.79	13.12, 34.03	
	M/P 33-36	Pre	233	16	68.8	23.25	13.29, 37.76	
		Post	168	8	28.9	27.70	11.96, 54.58	
	M/P 37+	Pre	174	44	12.0	367.76	267.21, 493.70	
		Post	161	26	6.4	408.35	266.75, 598.32	
	Status 1s	Pre	110	15	13.5	110.87	62.06, 182.87	
		Post	85	7	4.6	151.45	60.89, 312.05	
	Overall	Pre	1625	193	1288.7	14.98	12.94, 17.24	
		Post	1528	136	1104.8	12.31	10.33, 14.56	
	Black, Non-Hispanic	M/P <15	Pre	1450	72	936.4	7.69	6.02, 9.68
			Post	1238	66	821.2	8.04	6.22, 10.22
		M/P 15-28	Pre	1376	87	522.2	16.66	13.35, 20.55
			Post	1239	80	507.5	15.76	12.50, 19.62
		M/P 29-32	Pre	507	19	79.7	23.85	14.36, 37.25
			Post	388	18	45.7	39.40	23.35, 62.27
M/P 33-36		Pre	320	9	43.9	20.49	9.37, 38.90	
		Post	301	19	20.0	95.01	57.20, 148.37	
M/P 37+		Pre	313	54	18.1	298.32	224.11, 389.24	
		Post	294	45	8.4	533.80	389.36, 714.27	
Status 1s		Pre	171	29	7.5	385.47	258.16, 553.60	
		Post	204	34	7.1	477.86	330.93, 667.76	
Overall		Pre	2439	271	1615.9	16.77	14.83, 18.89	
		Post	2337	263	1416.0	18.57	16.40, 20.96	
M/P <15		Pre	3869	193	2368.4	8.15	7.04, 9.38	
		Post	3649	198	2239.7	8.84	7.65, 10.16	
		Pre	3552	271	1412.0	19.19	16.98, 21.62	
		Post	3445	295	1437.4	20.52	18.25, 23.00	

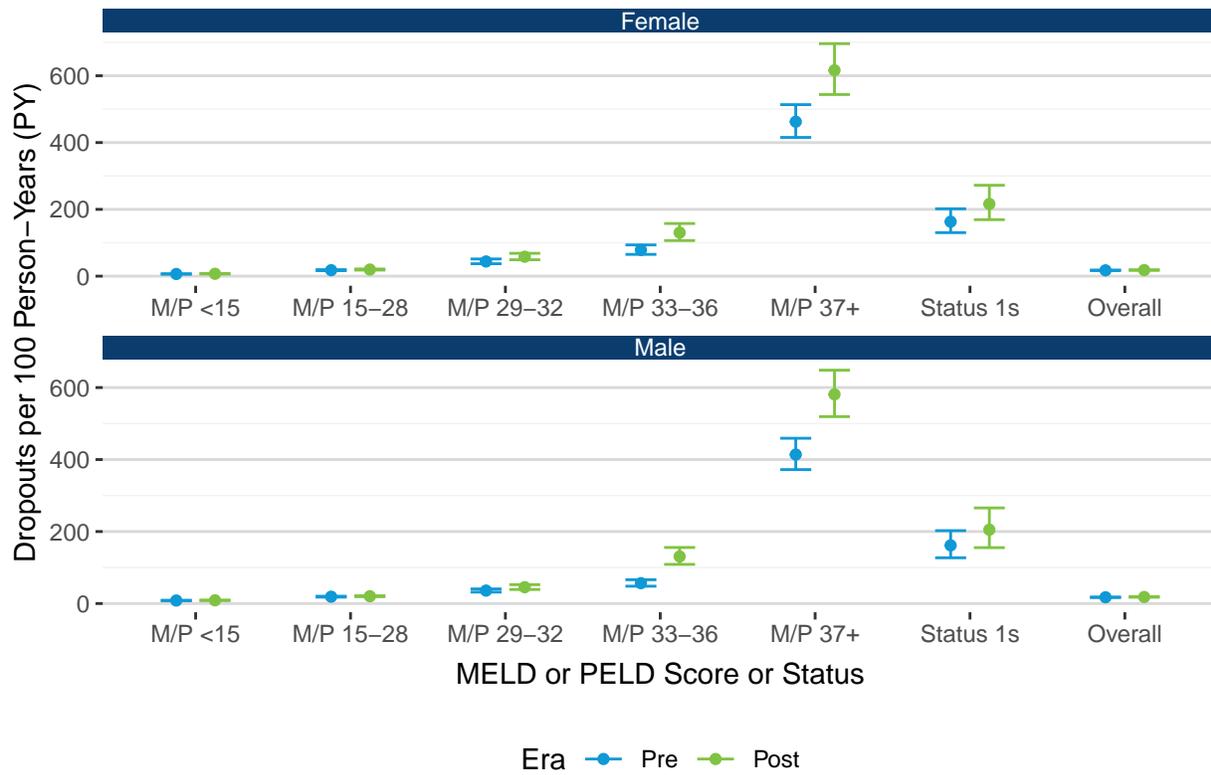
*(continued)*

Candidate Race/Ethnicity	Score or Status Group	Era	N	N	PY	Estimate	95% CI	
Hispanic/Latino	M/P 29-32	Pre	1494	92	244.4	37.65	30.35, 46.17	
		Post	1281	68	201.5	33.75	26.21, 42.79	
	M/P 33-36	Pre	828	62	91.4	67.87	52.04, 87.01	
		Post	718	51	35.9	142.09	105.79, 186.82	
	M/P 37+	Pre	795	163	33.0	493.69	420.81, 575.57	
		Post	715	131	23.3	562.60	470.38, 667.60	
	Status 1s	Pre	233	29	20.8	139.61	93.50, 200.50	
		Post	207	25	17.4	143.41	92.81, 211.70	
	Overall	Pre	5954	814	4215.7	19.31	18.00, 20.68	
		Post	6072	778	4008.2	19.41	18.07, 20.82	
	Other	M/P <15	Pre	309	11	176.2	6.24	3.12, 11.17
			Post	307	10	174.7	5.72	2.75, 10.53
		M/P 15-28	Pre	346	21	137.0	15.32	9.49, 23.42
			Post	331	24	146.4	16.40	10.51, 24.40
M/P 29-32		Pre	146	4	23.9	16.72	4.56, 42.81	
		Post	112	8	10.6	75.22	32.47, 148.21	
M/P 33-36		Pre	87	6	10.5	57.06	20.94, 124.20	
		Post	80	4	3.2	126.74	34.53, 324.49	
M/P 37+		Pre	73	11	3.1	352.19	175.81, 630.17	
		Post	71	8	2.7	300.72	129.83, 592.54	
Status 1s		Pre	34	3	3.3	90.65	18.69, 264.91	
		Post	35	5	1.8	270.37	87.79, 630.95	
Overall		Pre	575	58	359.2	16.15	12.26, 20.88	
		Post	592	60	344.1	17.44	13.30, 22.44	
Other	M/P <15	Pre	14627	722	9476.3	7.62	7.07, 8.20	
		Post	13164	700	8511.4	8.22	7.63, 8.86	
	M/P 15-28	Pre	14700	1097	5805.0	18.90	17.80, 20.05	
		Post	13948	1163	5529.8	21.03	19.84, 22.28	
	M/P 29-32	Pre	4679	275	608.6	45.19	40.00, 50.86	
		Post	3716	215	305.8	70.30	61.22, 80.35	
	M/P 33-36	Pre	2461	190	224.9	84.47	72.89, 97.37	
		Post	2158	150	89.1	168.30	142.44, 197.49	
	M/P 37+	Pre	2168	436	96.9	450.13	408.87, 494.43	
		Post	2209	371	56.8	653.55	588.73, 723.55	
	Status 1s	Pre	635	84	53.4	157.28	125.45, 194.72	
		Post	518	58	30.1	192.75	146.37, 249.18	

*(continued)*

Candidate Race/Ethnicity	Score or Status Group	Era	N	N	PY	Estimate	95% CI
White, Non-Hispanic	Overall	Pre	23858	2824	16464.2	17.15	16.53, 17.80
		Post	23391	2682	14713.8	18.23	17.54, 18.93

**Figure 88. Liver-Alone Waitlist Rates of Removal Due to Death or Too Sick Per 100 Person-Years Waiting by MELD or PELD Score or Status, Candidate Sex, and Era**



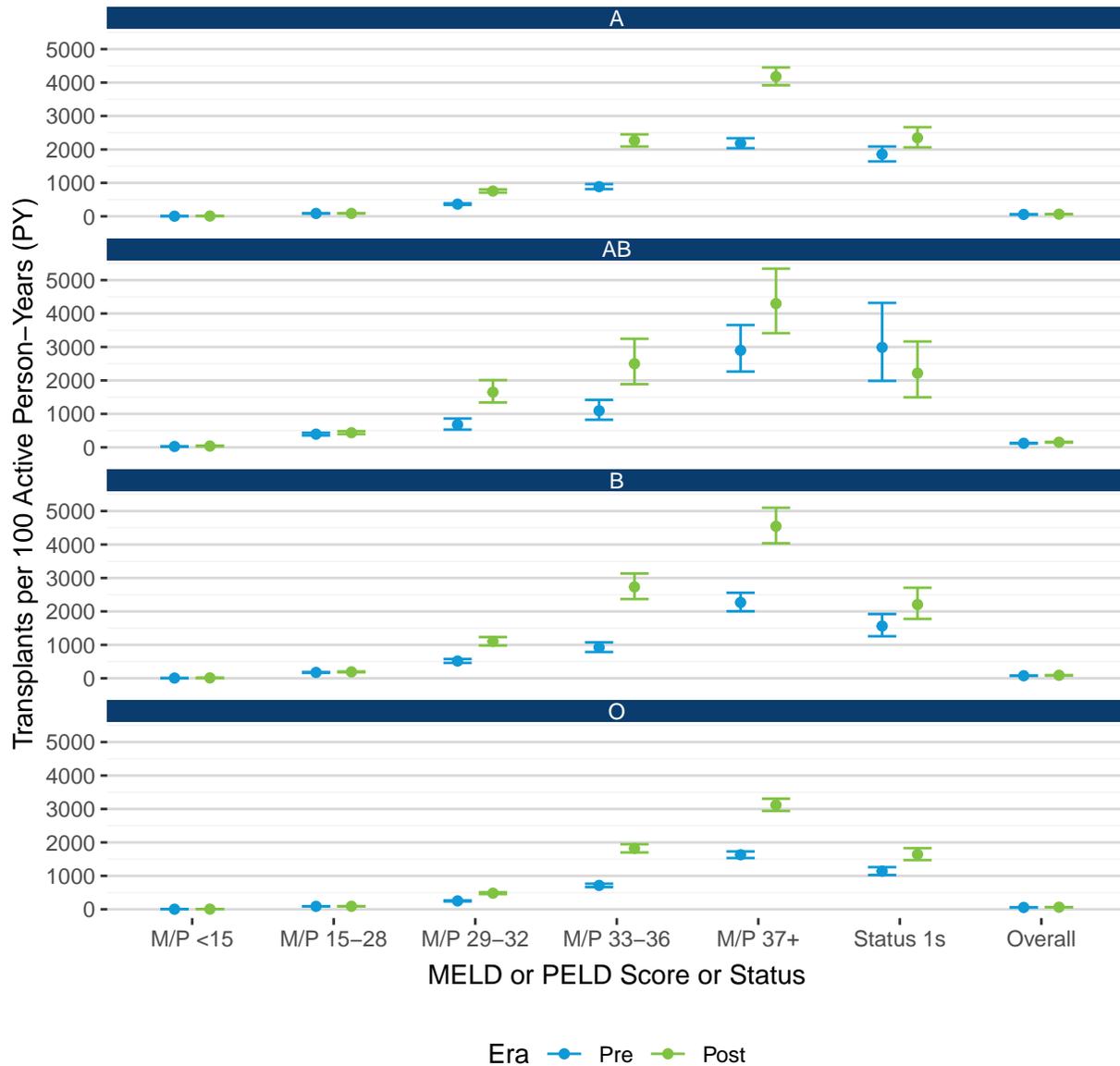
National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 81. Liver-Along Waitlist Rates of Removal Due to Death or Too Sick Per 100 Person-Years Waiting by MELD or PELD Score or Status, Candidate Sex, and Era**

Candidate Sex	Score or Status Group	Era	Ever Waiting	Death/ Too Sick Events	Person- Years	Dropouts per 100 PY	
			N	N	PY	Estimate	95% CI
Female	M/P <15	Pre	7985	353	5451.2	6.48	5.82, 7.19
		Post	7451	357	4978.6	7.17	6.45, 7.95
	M/P 15-28	Pre	7649	558	3120.6	17.88	16.43, 19.43
		Post	7378	595	3013.2	19.75	18.19, 21.40
	M/P 29-32	Pre	2682	154	350.4	43.95	37.28, 51.47
		Post	2409	146	250.9	58.18	49.13, 68.42
	M/P 33-36	Pre	1621	123	156.8	78.43	65.19, 93.58
		Post	1442	106	81.4	130.30	106.68, 157.59
	M/P 37+	Pre	1503	351	75.9	462.48	415.35, 513.48
		Post	1367	260	42.2	616.43	543.78, 696.10
	Status 1s	Pre	643	85	52.1	163.10	130.28, 201.68
		Post	587	72	33.3	216.14	169.11, 272.19
	Overall	Pre	13064	1634	9356.0	17.46	16.63, 18.33
		Post	13148	1551	8545.5	18.15	17.26, 19.08
Male	M/P <15	Pre	13340	693	8258.8	8.39	7.78, 9.04
		Post	11805	659	7371.9	8.94	8.27, 9.65
	M/P 15-28	Pre	13063	959	5037.9	19.04	17.85, 20.28
		Post	12303	999	4940.8	20.22	18.99, 21.51
	M/P 29-32	Pre	4581	263	731.3	35.96	31.75, 40.58
		Post	3405	181	399.4	45.31	38.95, 52.42
	M/P 33-36	Pre	2307	160	282.6	56.61	48.18, 66.09
		Post	1979	125	95.6	130.72	108.81, 155.75
	M/P 37+	Pre	2017	357	86.3	413.89	372.06, 459.13
		Post	2079	321	55.2	581.15	519.30, 648.33
	Status 1s	Pre	538	75	46.4	161.55	127.07, 202.51
		Post	462	57	27.8	205.06	155.31, 265.67
	Overall	Pre	21323	2523	14571.5	17.31	16.65, 18.00
		Post	20712	2365	13026.1	18.16	17.43, 18.90

### Additional Transplant Rates Information

Figure 89. Liver-Alone Transplant Rates Per 100 Active Person-Years Waiting by MELD or PELD Score or Status, Candidate ABO, and Era



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

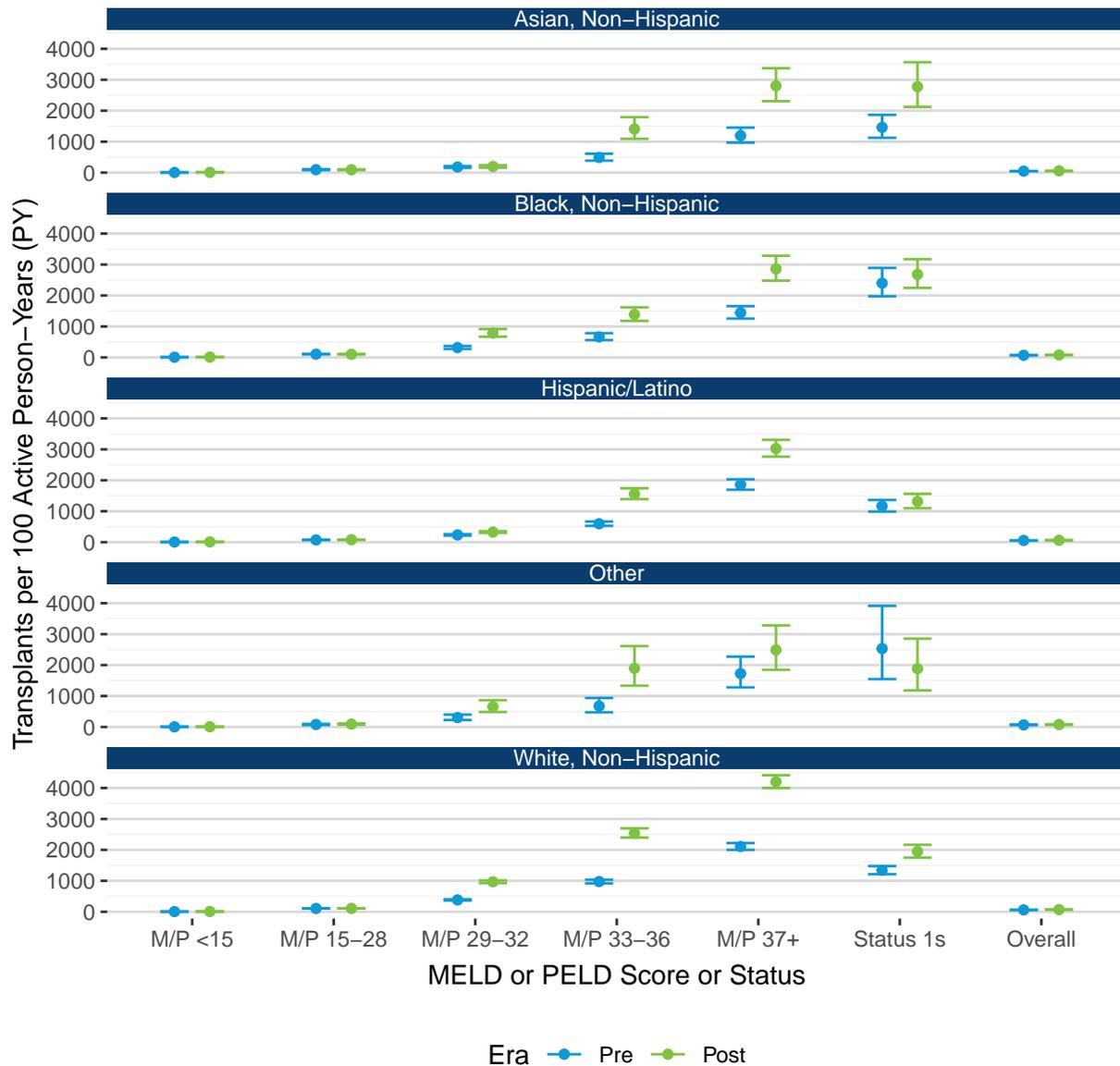
**Table 82. Liver-Along Transplant Rates Per 100 Active Person-Years Waiting by MELD or PELD Score or Status, Candidate ABO, and Era**

Candidate ABO	Score or Status Group	Era	Ever Waiting	Transplant Events	Person-Years	Transplants per 100 Active PY	
			N	N	PY	Estimate	95% CI
A	M/P <15	Pre	7607	197	4292.6	4.59	3.97, 5.28
		Post	6950	297	3749.2	7.92	7.05, 8.88
	M/P 15-28	Pre	7755	2308	2693.0	85.70	82.24, 89.27
		Post	7332	2314	2641.7	87.59	84.06, 91.24
	M/P 29-32	Pre	2768	1024	281.0	364.37	342.39, 387.39
		Post	2183	989	131.0	755.14	708.80, 803.70
	M/P 33-36	Pre	1403	548	61.8	886.22	813.56, 963.62
		Post	1228	611	27.0	2263.19	2087.27, 2449.98
	M/P 37+	Pre	1304	835	38.3	2181.64	2036.15, 2334.77
		Post	1318	961	23.0	4177.76	3917.77, 4450.48
	Status 1s	Pre	401	276	14.9	1854.91	1642.51, 2087.15
		Post	337	241	10.3	2348.87	2061.65, 2664.90
	Overall	Pre	13020	5188	9235.6	56.17	54.66, 57.72
		Post	12792	5413	8398.3	64.45	62.75, 66.19
AB	M/P <15	Pre	575	61	239.0	25.52	19.52, 32.79
		Post	500	77	199.1	38.66	30.51, 48.32
	M/P 15-28	Pre	623	400	101.4	394.29	356.59, 434.88
		Post	624	394	90.2	436.86	394.78, 482.20
	M/P 29-32	Pre	166	69	10.1	679.94	529.03, 860.51
		Post	155	99	6.0	1650.75	1341.65, 2009.73
	M/P 33-36	Pre	126	56	5.1	1093.05	825.68, 1419.41
		Post	84	56	2.2	2498.78	1887.55, 3244.87
	M/P 37+	Pre	104	71	2.4	2898.77	2263.96, 3656.40
		Post	107	81	1.9	4297.24	3412.63, 5341.07
	Status 1s	Pre	39	28	0.9	2988.30	1985.71, 4318.93
		Post	39	30	1.4	2216.60	1495.53, 3164.33
	Overall	Pre	1151	685	564.4	121.37	112.45, 130.81
		Post	1159	737	484.7	152.06	141.28, 163.44
	M/P <15	Pre	2280	93	1263.3	7.36	5.94, 9.02
		Post	1983	136	1099.6	12.37	10.38, 14.63
	M/P 15-28	Pre	2286	1030	587.9	175.20	164.66, 186.24
		Post	2092	964	501.5	192.21	180.27, 204.74
		Pre	734	320	62.0	516.11	461.10, 575.87

*(continued)*

Candidate ABO	Score or Status Group	Era	N	N	PY	Estimate	95% CI
B	M/P 29-32	Post	568	300	27.2	1101.61	980.47, 1233.59
		Pre	375	164	17.8	922.63	786.82, 1075.14
	M/P 33-36	Post	350	204	7.5	2732.48	2370.36, 3134.27
		Pre	401	266	11.7	2268.99	2004.48, 2558.69
	M/P 37+	Post	378	290	6.4	4544.87	4036.78, 5099.21
		Pre	141	90	5.8	1563.54	1257.27, 1921.86
	Status 1s	Post	130	91	4.1	2205.51	1775.74, 2707.88
		Pre	4046	1963	2555.4	76.82	73.46, 80.29
	Overall	Post	3886	1985	2208.2	89.89	85.98, 93.94
		Pre	9603	211	5244.7	4.02	3.50, 4.60
O	M/P <15	Post	8619	303	4682.1	6.47	5.76, 7.24
		Pre	9444	2921	3275.8	89.17	85.96, 92.46
	M/P 15-28	Post	9037	2863	3154.0	90.77	87.48, 94.16
		Pre	3460	1086	432.1	251.31	236.58, 266.71
	M/P 29-32	Post	2752	1233	255.3	482.95	456.37, 510.68
		Pre	1920	792	110.8	714.52	665.62, 766.06
	M/P 33-36	Post	1664	853	46.9	1819.45	1699.39, 1945.77
		Pre	1677	1074	65.9	1629.30	1533.30, 1729.74
	M/P 37+	Post	1601	1136	36.4	3119.00	2940.24, 3305.79
		Pre	575	367	32.2	1138.20	1024.72, 1260.82
	Status 1s	Post	521	335	20.4	1643.04	1471.79, 1828.75
		Pre	16166	6451	11571.4	55.75	54.40, 57.13
	Overall	Post	16018	6723	10480.0	64.15	62.63, 65.70

**Figure 90. Liver-Alone Transplant Rates Per 100 Active Person-Years Waiting by MELD or PELD Score or Status, Candidate Race/Ethnicity, and Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 83. Liver-Along Transplant Rates Per 100 Active Person-Years Waiting by MELD or PELD Score or Status, Candidate Race/Ethnicity, and Era**

Candidate Race/Ethnicity	Score or Status Group	Era	Ever Waiting	Transplant Events	Person-Years	Transplants per 100 Active PY	
			N	N	PY	Estimate	95% CI
Asian, Non-Hispanic	M/P <15	Pre	1006	22	569.4	3.86	2.42, 5.85
		Post	843	40	450.9	8.87	6.34, 12.08
	M/P 15-28	Pre	742	203	215.9	94.01	81.52, 107.86
		Post	719	242	261.8	92.44	81.16, 104.85
	M/P 29-32	Pre	428	147	81.7	179.89	151.99, 211.44
		Post	305	110	55.9	196.61	161.59, 236.97
	M/P 33-36	Pre	210	78	15.9	489.85	387.20, 611.35
		Post	147	67	4.8	1410.32	1092.98, 1791.06
	M/P 37+	Pre	171	99	8.3	1193.76	970.23, 1453.36
		Post	159	112	4.0	2801.92	2307.09, 3371.44
	Status 1s	Pre	106	64	4.4	1460.91	1125.08, 1865.55
		Post	83	61	2.2	2776.18	2123.56, 3566.13
	Overall	Pre	1625	613	1288.7	47.57	43.88, 51.49
		Post	1528	632	1104.8	57.21	52.83, 61.85
	M/P <15	Pre	1368	42	750.7	5.59	4.03, 7.56
		Post	1156	58	636.0	9.12	6.92, 11.79
	M/P 15-28	Pre	1328	420	402.9	104.25	94.52, 114.72
		Post	1186	403	396.7	101.59	91.92, 112.01
	M/P 29-32	Pre	497	180	56.8	317.04	272.41, 366.89
		Post	375	162	20.6	785.68	669.35, 916.41
M/P 33-36	Pre	311	143	21.5	663.64	559.33, 781.75	
	Post	292	162	11.7	1385.43	1180.30, 1615.96	
M/P 37+	Pre	309	206	14.3	1444.85	1254.27, 1656.20	
	Post	294	202	7.1	2861.08	2480.11, 3284.01	
Status 1s	Pre	168	111	4.6	2400.18	1974.49, 2890.43	
	Post	201	135	5.0	2680.90	2247.76, 3173.17	
Overall	Pre	2439	1102	1615.9	68.20	64.23, 72.35	
	Post	2337	1122	1416.0	79.24	74.67, 84.01	
M/P <15	Pre	3662	94	1962.6	4.79	3.87, 5.86	
	Post	3447	142	1767.2	8.04	6.77, 9.47	
M/P 15-28	Pre	3460	882	1205.6	73.16	68.41, 78.15	
	Post	3359	938	1183.9	79.23	74.24, 84.46	
Overall	Pre	1477	445	190.9	233.14	211.98, 255.84	
	Post						

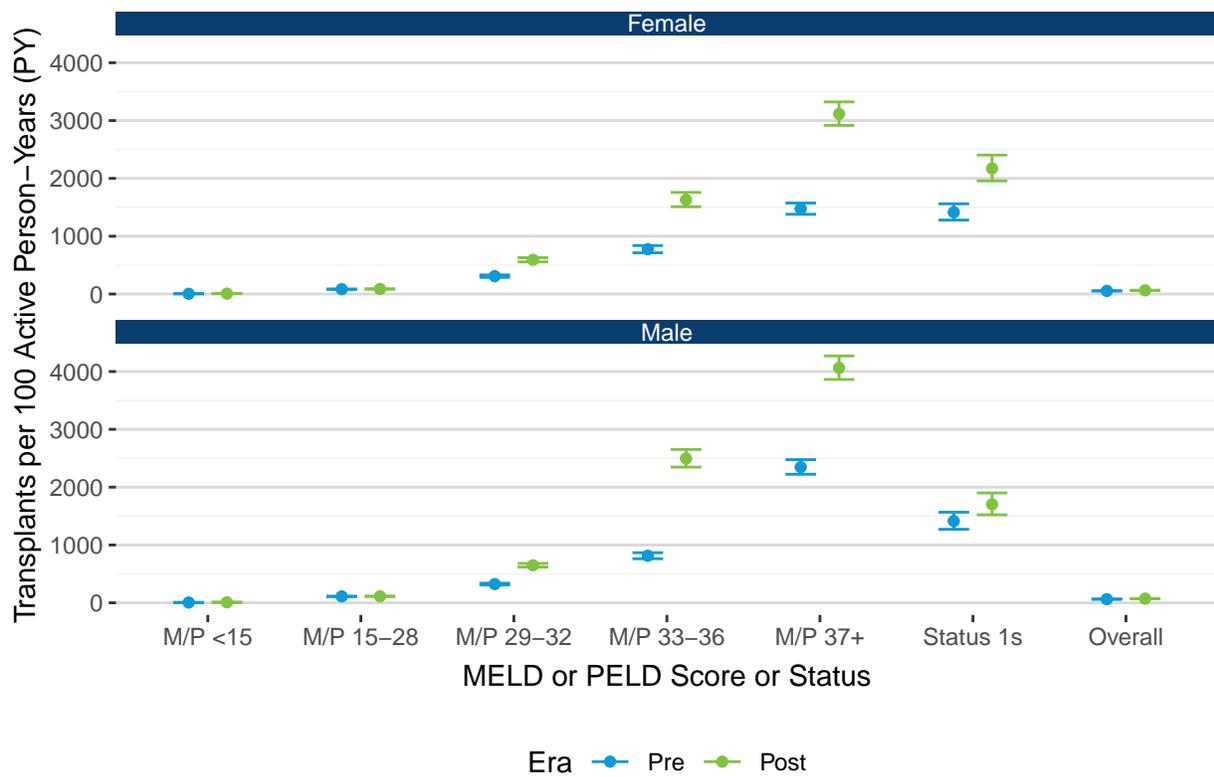
*(continued)*

Candidate Race/Ethnicity	Score or Status Group	Era	N	N	PY	Estimate	95% CI	
Hispanic/Latino	M/P 29-32	Post	1248	486	148.4	327.44	298.97, 357.89	
		Pre	811	295	49.6	595.22	529.23, 667.16	
	M/P 33-36	Post	705	316	20.3	1560.12	1392.83, 1741.97	
		Pre	789	486	26.2	1858.27	1696.71, 2031.06	
	M/P 37+	Post	707	487	16.1	3026.65	2763.77, 3307.79	
		Pre	229	153	13.1	1165.14	987.83, 1365.08	
	Status 1s	Post	204	130	9.9	1316.23	1099.70, 1562.91	
		Pre	5954	2355	4215.7	55.86	53.63, 58.17	
	Overall	Post	6072	2499	4008.2	62.35	59.93, 64.84	
		Pre	288	5	134.4	3.72	1.21, 8.68	
	Other	M/P <15	Post	282	9	128.8	6.99	3.20, 13.27
			Pre	335	85	106.6	79.73	63.68, 98.58
		M/P 15-28	Post	316	102	110.2	92.52	75.44, 112.32
			Pre	144	50	16.5	302.60	224.60, 398.94
M/P 29-32		Post	110	49	7.5	654.41	484.14, 865.16	
		Pre	86	36	5.3	676.97	474.14, 937.21	
M/P 33-36		Post	79	37	2.0	1896.77	1335.50, 2614.45	
		Pre	72	50	2.9	1724.95	1280.29, 2274.14	
M/P 37+		Post	70	50	2.0	2489.77	1847.95, 3282.45	
		Pre	32	20	0.8	2534.72	1548.27, 3914.67	
Status 1s		Post	34	22	1.2	1884.98	1181.30, 2853.88	
		Pre	575	246	359.2	68.49	60.20, 77.61	
Overall		Post	592	269	344.1	78.17	69.11, 88.09	
		Pre	13766	394	7625.5	5.17	4.67, 5.70	
Other	M/P <15	Post	12346	560	6750.9	8.30	7.62, 9.01	
		Pre	14277	5074	4732.2	107.22	104.29, 110.21	
	M/P 15-28	Post	13531	4853	4439.4	109.32	106.26, 112.44	
		Pre	4587	1680	439.7	382.07	364.01, 400.78	
	M/P 29-32	Post	3632	1815	187.4	968.67	924.62, 1014.29	
		Pre	2407	1008	103.3	975.60	916.30, 1037.74	
	M/P 33-36	Post	2107	1144	45.0	2543.46	2398.19, 2695.23	
		Pre	2147	1409	66.8	2108.16	1999.50, 2221.18	
	M/P 37+	Post	2177	1620	38.5	4202.56	4000.38, 4412.31	
		Pre	623	414	30.9	1340.10	1214.11, 1475.62	
	Status 1s	Post	505	348	17.9	1949.36	1749.90, 2165.31	
		Pre	23858	9979	16464.2	60.61	59.43, 61.81	

*(continued)*

Candidate Race/Ethnicity	Score or Status Group	Era	N	N	PY	Estimate	95% CI
White, Non-Hispanic	Overall	Post	23391	10340	14713.8	70.27	68.93, 71.64

**Figure 91. Liver-Alone Transplant Rates Per 100 Active Person-Years Waiting by MELD or PELD Score or Status, Candidate Sex, and Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

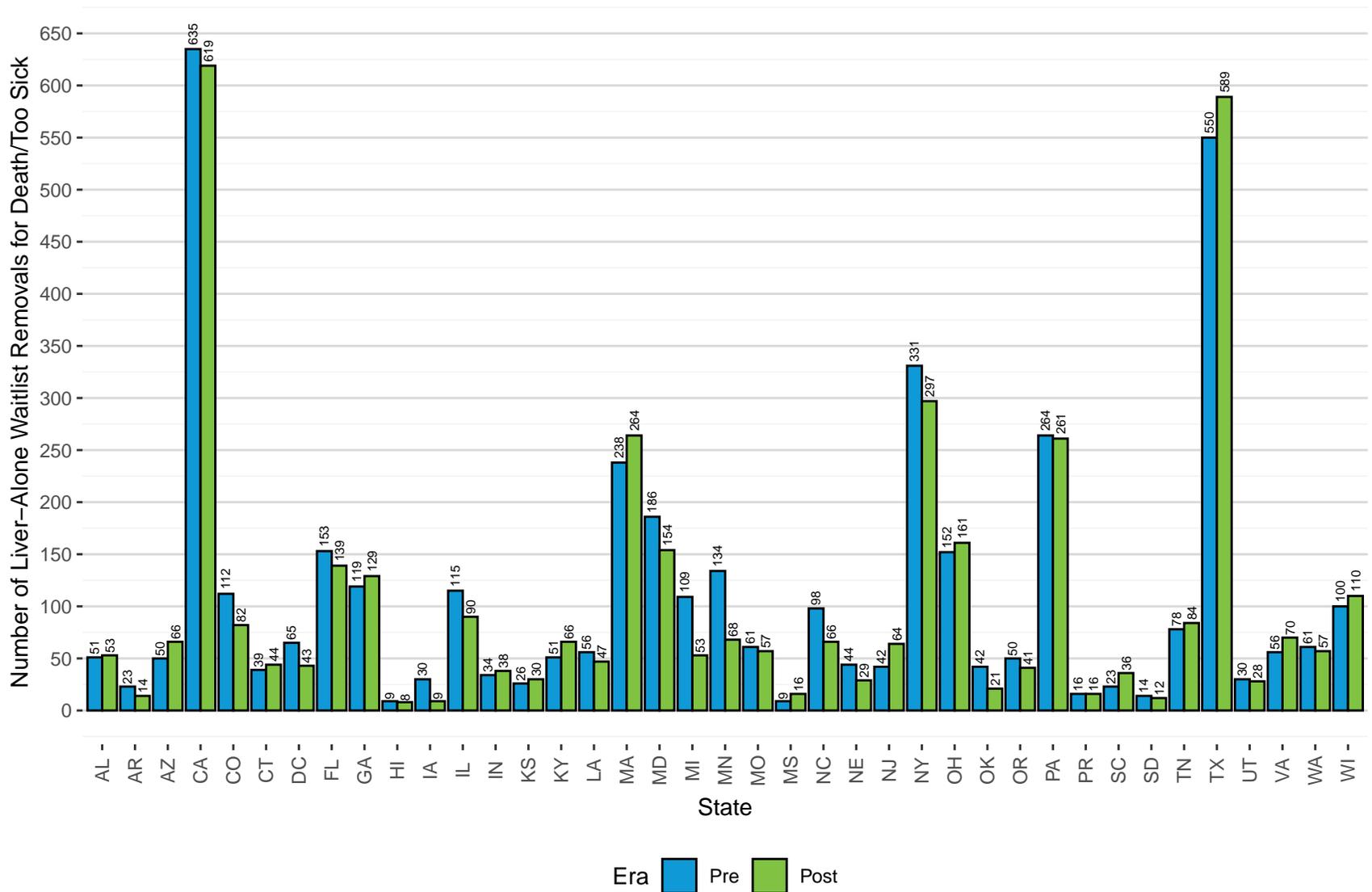
**Table 84. Liver-Alone Transplant Rates Per 100 Active Person-Years Waiting by MELD or PELD Score or Status, Candidate Sex, and Era**

Candidate Sex	Score or Status Group	Era	Ever Waiting	Transplant Events	Person-Years	Transplants per 100 Active PY	
			N	N	PY	Estimate	95% CI
Female	M/P <15	Pre	7485	196	4374.7	4.48	3.88, 5.15
		Post	6966	298	3913.4	7.61	6.77, 8.53
	M/P 15-28	Pre	7431	2158	2587.0	83.42	79.93, 87.01
		Post	7169	2143	2463.4	86.99	83.35, 90.76
	M/P 29-32	Pre	2643	840	272.2	308.62	288.10, 330.22
		Post	2363	1031	174.3	591.53	555.97, 628.77
	M/P 33-36	Pre	1592	607	78.4	774.05	713.68, 838.15
		Post	1404	682	41.8	1630.08	1510.02, 1757.15
	M/P 37+	Pre	1490	899	61.0	1474.37	1379.55, 1573.98
		Post	1349	921	29.6	3114.66	2916.73, 3322.49
	Status 1s	Pre	631	399	28.2	1414.34	1278.95, 1560.17
		Post	572	374	17.2	2171.31	1956.80, 2402.91
	Overall	Pre	13064	5099	9356.0	54.50	53.01, 56.02
		Post	13148	5449	8545.5	63.76	62.08, 65.48
Male	M/P <15	Pre	12582	366	6665.0	5.49	4.94, 6.08
		Post	11087	515	5816.7	8.85	8.11, 9.65
	M/P 15-28	Pre	12680	4501	4071.4	110.55	107.35, 113.83
		Post	11918	4393	3924.4	111.94	108.66, 115.30
	M/P 29-32	Pre	4486	1659	513.2	323.27	307.90, 339.21
		Post	3295	1591	245.2	648.83	617.34, 681.51
	M/P 33-36	Pre	2232	953	117.2	813.43	762.59, 866.75
		Post	1923	1042	41.7	2496.10	2346.82, 2652.38
	M/P 37+	Pre	1996	1347	57.4	2347.14	2223.45, 2475.91
		Post	2054	1548	38.1	4062.55	3862.67, 4270.10
	Status 1s	Pre	525	362	25.6	1413.76	1271.86, 1567.17
		Post	455	322	18.9	1703.33	1522.35, 1899.92
	Overall	Pre	21323	9188	14571.5	63.05	61.77, 64.36
		Post	20712	9411	13026.1	72.25	70.80, 73.72

**Additional Waitlist Removals Information****Table 85. Liver-Alone Registrations Removed for Death or Too Sick to Transplant by State and Era**

State	Pre-Policy	Post-Policy
AL	51 (1.2%)	53 (1.3%)
AR	23 (0.5%)	14 (0.3%)
AZ	50 (1.2%)	66 (1.6%)
CA	635 (14.9%)	619 (15.4%)
CO	112 (2.6%)	82 (2.0%)
CT	39 (0.9%)	44 (1.1%)
DC	65 (1.5%)	43 (1.1%)
FL	153 (3.6%)	139 (3.4%)
GA	119 (2.8%)	129 (3.2%)
HI	9 (0.2%)	8 (0.2%)
IA	30 (0.7%)	9 (0.2%)
IL	115 (2.7%)	90 (2.2%)
IN	34 (0.8%)	38 (0.9%)
KS	26 (0.6%)	30 (0.7%)
KY	51 (1.2%)	66 (1.6%)
LA	56 (1.3%)	47 (1.2%)
MA	238 (5.6%)	264 (6.5%)
MD	186 (4.4%)	154 (3.8%)
MI	109 (2.6%)	53 (1.3%)
MN	134 (3.1%)	68 (1.7%)
MO	61 (1.4%)	57 (1.4%)
MS	9 (0.2%)	16 (0.4%)
NC	98 (2.3%)	66 (1.6%)
NE	44 (1.0%)	29 (0.7%)
NJ	42 (1.0%)	64 (1.6%)
NY	331 (7.8%)	297 (7.4%)
OH	152 (3.6%)	161 (4.0%)
OK	42 (1.0%)	21 (0.5%)
OR	50 (1.2%)	41 (1.0%)
PA	264 (6.2%)	261 (6.5%)
PR	16 (0.4%)	16 (0.4%)
SC	23 (0.5%)	36 (0.9%)
SD	14 (0.3%)	12 (0.3%)
TN	78 (1.8%)	84 (2.1%)
TX	550 (12.9%)	589 (14.6%)
UT	30 (0.7%)	28 (0.7%)
VA	56 (1.3%)	70 (1.7%)
WA	61 (1.4%)	57 (1.4%)
WI	100 (2.3%)	110 (2.7%)
Total	4256 (100.0%)	4031 (100.0%)

Figure 92. Liver-Alone Registrations Removed for Death or Too Sick to Transplant by State and Era



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Additional Deceased Donor Liver-Alone Transplant Information****Table 85. Number of Deceased Donor Liver-Alone Transplants by Transplant Program and Era**

Transplant Program	Pre-Policy	Post-Policy
ALCH-TX1	10 (0.1%)	4 (0.0%)
ALUA-TX1	224 (1.5%)	148 (1.0%)
ARUA-TX1	74 (0.5%)	73 (0.5%)
AZCH-TX1	15 (0.1%)	12 (0.1%)
AZGS-TX1	242 (1.7%)	124 (0.8%)
AZMC-TX1	263 (1.8%)	330 (2.2%)
AZSJ-TX1	49 (0.3%)	52 (0.3%)
AZUA-TX1	14 (0.1%)	14 (0.1%)
CACL-TX1	45 (0.3%)	39 (0.3%)
CACS-TX1	174 (1.2%)	174 (1.1%)
CAGH-TX1	52 (0.4%)	50 (0.3%)
CALL-TX1	176 (1.2%)	192 (1.3%)
CAMB-TX1	19 (0.1%)	11 (0.1%)
CAPC-TX1	49 (0.3%)	36 (0.2%)
CAPM-TX1	102 (0.7%)	112 (0.7%)
CASD-TX1	84 (0.6%)	154 (1.0%)
CASF-TX1	250 (1.7%)	252 (1.6%)
CASU-TX1	129 (0.9%)	184 (1.2%)
CASV-TX1	13 (0.1%)	0 (0.0%)
CAUC-TX1	295 (2.0%)	275 (1.8%)
CAUH-TX1	170 (1.2%)	227 (1.5%)
COCH-TX1	13 (0.1%)	10 (0.1%)
COPM-TX1	6 (0.0%)	13 (0.1%)
COSL-TX1	23 (0.2%)	36 (0.2%)
COUC-TX1	190 (1.3%)	181 (1.2%)
CTHH-TX1	47 (0.3%)	52 (0.3%)
CTYN-TX1	45 (0.3%)	46 (0.3%)
DCGU-TX1	189 (1.3%)	196 (1.3%)
DEAI-TX1	7 (0.0%)	10 (0.1%)
FLBC-TX1	24 (0.2%)	28 (0.2%)
FLCC-TX1	107 (0.7%)	57 (0.4%)
FLFH-TX1	123 (0.8%)	106 (0.7%)
FLJM-TX1	220 (1.5%)	261 (1.7%)
FLLM-TX1	33 (0.2%)	20 (0.1%)
FLSL-TX1	297 (2.0%)	266 (1.7%)
FLTG-TX1	218 (1.5%)	267 (1.7%)
FLUF-TX1	53 (0.4%)	199 (1.3%)
GAEH-TX1	51 (0.3%)	39 (0.3%)
GAEM-TX1	242 (1.7%)	197 (1.3%)
GAPH-TX1	230 (1.6%)	264 (1.7%)
HIQM-TX1	24 (0.2%)	32 (0.2%)
IAIV-TX1	61 (0.4%)	40 (0.3%)
ILCM-TX1	24 (0.2%)	19 (0.1%)
ILLU-TX1	114 (0.8%)	135 (0.9%)
ILNM-TX1	168 (1.1%)	175 (1.1%)

*(continued)*

Transplant Program	Pre-Policy	Post-Policy
ILPL-TX1	58 (0.4%)	71 (0.5%)
ILUC-TX1	66 (0.5%)	110 (0.7%)
ILUI-TX1	85 (0.6%)	105 (0.7%)
INIM-TX1	284 (1.9%)	247 (1.6%)
KSUK-TX1	124 (0.8%)	77 (0.5%)
KYJH-TX1	44 (0.3%)	34 (0.2%)
KYUK-TX1	79 (0.5%)	112 (0.7%)
LACH-TX1	0 (0.0%)	1 (0.0%)
LAOF-TX1	382 (2.6%)	289 (1.9%)
LATU-TX1	36 (0.2%)	36 (0.2%)
LAWK-TX1	32 (0.2%)	16 (0.1%)
MABI-TX1	65 (0.4%)	71 (0.5%)
MACH-TX1	12 (0.1%)	23 (0.2%)
MALC-TX1	132 (0.9%)	120 (0.8%)
MAMG-TX1	136 (0.9%)	140 (0.9%)
MAUM-TX1	107 (0.7%)	132 (0.9%)
MDJH-TX1	185 (1.3%)	205 (1.3%)
MDUM-TX1	161 (1.1%)	169 (1.1%)
MIBH-TX1	49 (0.3%)	39 (0.3%)
MICH-TX1	3 (0.0%)	4 (0.0%)
MIHF-TX1	171 (1.2%)	163 (1.1%)
MIUM-TX1	157 (1.1%)	148 (1.0%)
MNMC-TX1	168 (1.1%)	225 (1.5%)
MNUM-TX1	149 (1.0%)	175 (1.1%)
MOBH-TX1	210 (1.4%)	244 (1.6%)
MOCG-TX1	3 (0.0%)	1 (0.0%)
MOCH-TX1	23 (0.2%)	29 (0.2%)
MOCM-TX1	16 (0.1%)	0 (0.0%)
MOLH-TX1	43 (0.3%)	49 (0.3%)
MOSL-TX1	62 (0.4%)	51 (0.3%)
MSUM-TX1	81 (0.6%)	72 (0.5%)
NCCM-TX1	156 (1.1%)	144 (0.9%)
NCDU-TX1	202 (1.4%)	190 (1.2%)
NCMH-TX1	73 (0.5%)	57 (0.4%)
NEUN-TX1	143 (1.0%)	194 (1.3%)
NJLL-TX1	21 (0.1%)	29 (0.2%)
NJUH-TX1	85 (0.6%)	74 (0.5%)
NYCP-TX1	111 (0.8%)	173 (1.1%)
NYFL-TX1	80 (0.5%)	160 (1.0%)
NYMA-TX1	85 (0.6%)	86 (0.6%)
NYMS-TX1	195 (1.3%)	280 (1.8%)
NYNS-TX1	1 (0.0%)	17 (0.1%)
NYNY-TX1	95 (0.6%)	100 (0.7%)
NYUC-TX1	86 (0.6%)	85 (0.6%)
NYWC-TX1	61 (0.4%)	130 (0.9%)
OHCC-TX1	214 (1.5%)	278 (1.8%)
OHCH-TX1	1 (0.0%)	4 (0.0%)

*(continued)*

Transplant Program	Pre-Policy	Post-Policy
OHCM-TX1	40 (0.3%)	56 (0.4%)
OHOU-TX1	232 (1.6%)	255 (1.7%)
OHUC-TX1	233 (1.6%)	259 (1.7%)
OHUH-TX1	36 (0.2%)	38 (0.2%)
OKBC-TX1	99 (0.7%)	158 (1.0%)
OKMD-TX1	6 (0.0%)	49 (0.3%)
ORUO-TX1	116 (0.8%)	120 (0.8%)
ORVA-TX1	43 (0.3%)	34 (0.2%)
PAAE-TX1	121 (0.8%)	119 (0.8%)
PAAG-TX1	80 (0.5%)	71 (0.5%)
PACH-TX1	32 (0.2%)	36 (0.2%)
PACP-TX1	26 (0.2%)	32 (0.2%)
PAGM-TX1	32 (0.2%)	18 (0.1%)
PAHE-TX1	48 (0.3%)	20 (0.1%)
PAHM-TX1	14 (0.1%)	0 (0.0%)
PAPT-TX1	95 (0.6%)	95 (0.6%)
PARH-TX1	0 (0.0%)	3 (0.0%)
PATJ-TX1	156 (1.1%)	151 (1.0%)
PATU-TX1	19 (0.1%)	19 (0.1%)
PAUP-TX1	227 (1.5%)	226 (1.5%)
PAVA-TX1	86 (0.6%)	46 (0.3%)
PRSJ-TX1	72 (0.5%)	65 (0.4%)
SCMU-TX1	146 (1.0%)	132 (0.9%)
SDMK-TX1	18 (0.1%)	15 (0.1%)
TNLB-TX1	8 (0.1%)	4 (0.0%)
TNMH-TX1	190 (1.3%)	204 (1.3%)
TNVU-TX1	255 (1.7%)	237 (1.6%)
TXAS-TX1	82 (0.6%)	81 (0.5%)
TXBC-TX1	138 (0.9%)	133 (0.9%)
TXCM-TX1	22 (0.2%)	25 (0.2%)
TXHH-TX1	60 (0.4%)	52 (0.3%)
TXHI-TX1	149 (1.0%)	148 (1.0%)
TXHS-TX1	86 (0.6%)	124 (0.8%)
TXJS-TX1	36 (0.2%)	29 (0.2%)
TXMC-TX1	138 (0.9%)	123 (0.8%)
TXMH-TX1	244 (1.7%)	311 (2.0%)
TXPL-TX1	1 (0.0%)	0 (0.0%)
TXSP-TX1	194 (1.3%)	187 (1.2%)
TXTC-TX1	70 (0.5%)	68 (0.4%)
TXTX-TX1	179 (1.2%)	108 (0.7%)
TXUC-TX1	2 (0.0%)	3 (0.0%)
TXVA-TX1	27 (0.2%)	10 (0.1%)
UTLD-TX1	90 (0.6%)	149 (1.0%)
UTMC-TX1	54 (0.4%)	61 (0.4%)
UTPC-TX1	26 (0.2%)	13 (0.1%)
VAMC-TX1	150 (1.0%)	251 (1.6%)
VAUV-TX1	181 (1.2%)	127 (0.8%)
WACH-TX1	23 (0.2%)	20 (0.1%)

*(continued)*

Transplant Program	Pre-Policy	Post-Policy
WASM-TX1	75 (0.5%)	50 (0.3%)
WAUW-TX1	195 (1.3%)	189 (1.2%)
WICH-TX1	7 (0.0%)	3 (0.0%)
WISE-TX1	48 (0.3%)	49 (0.3%)
WISL-TX1	52 (0.4%)	43 (0.3%)
WIUW-TX1	197 (1.3%)	188 (1.2%)
Total	14646 (100.0%)	15278 (100.0%)

**Table 86. Number of Deceased Donor Liver-Alone Transplants by Transplant Program DSA and Era**

DSA	Pre-Policy	Post-Policy
ALOB	234 (1.6%)	152 (1.0%)
AROR	74 (0.5%)	73 (0.5%)
AZOB	583 (4.0%)	532 (3.5%)
CADN	549 (3.7%)	595 (3.9%)
CAOP	873 (6.0%)	907 (5.9%)
CASD	136 (0.9%)	204 (1.3%)
CORS	232 (1.6%)	240 (1.6%)
DCTC	189 (1.3%)	196 (1.3%)
FLFH	123 (0.8%)	106 (0.7%)
FLMP	351 (2.4%)	346 (2.3%)
FLUF	350 (2.4%)	465 (3.0%)
FLWC	251 (1.7%)	287 (1.9%)
GALL	523 (3.6%)	500 (3.3%)
HIOP	24 (0.2%)	32 (0.2%)
IAOP	61 (0.4%)	40 (0.3%)
ILIP	515 (3.5%)	615 (4.0%)
INOP	284 (1.9%)	247 (1.6%)
KYDA	123 (0.8%)	146 (1.0%)
LAOP	450 (3.1%)	342 (2.2%)
MAOB	544 (3.7%)	584 (3.8%)
MDPC	346 (2.4%)	374 (2.4%)
MIOP	380 (2.6%)	354 (2.3%)
MNOP	335 (2.3%)	415 (2.7%)
MOMA	298 (2.0%)	325 (2.1%)
MSOP	81 (0.6%)	72 (0.5%)
MWOB	183 (1.2%)	126 (0.8%)
NCCM	156 (1.1%)	144 (0.9%)
NCNC	275 (1.9%)	247 (1.6%)
NEOR	143 (1.0%)	194 (1.3%)
NJTO	106 (0.7%)	103 (0.7%)
NYFL	80 (0.5%)	160 (1.0%)
NYRT	634 (4.3%)	871 (5.7%)
OHLB	250 (1.7%)	316 (2.1%)
OHLP	233 (1.6%)	259 (1.7%)
OHOV	273 (1.9%)	315 (2.1%)
OKOP	105 (0.7%)	207 (1.4%)
ORUO	159 (1.1%)	154 (1.0%)
PADV	650 (4.4%)	598 (3.9%)
PATF	293 (2.0%)	248 (1.6%)
PRLI	72 (0.5%)	65 (0.4%)
SCOP	146 (1.0%)	132 (0.9%)
TNDS	255 (1.7%)	237 (1.6%)
TNMS	198 (1.4%)	208 (1.4%)
TXGC	633 (4.3%)	670 (4.4%)
TXSA	226 (1.5%)	260 (1.7%)
TXSB	569 (3.9%)	472 (3.1%)
UTOP	170 (1.2%)	223 (1.5%)

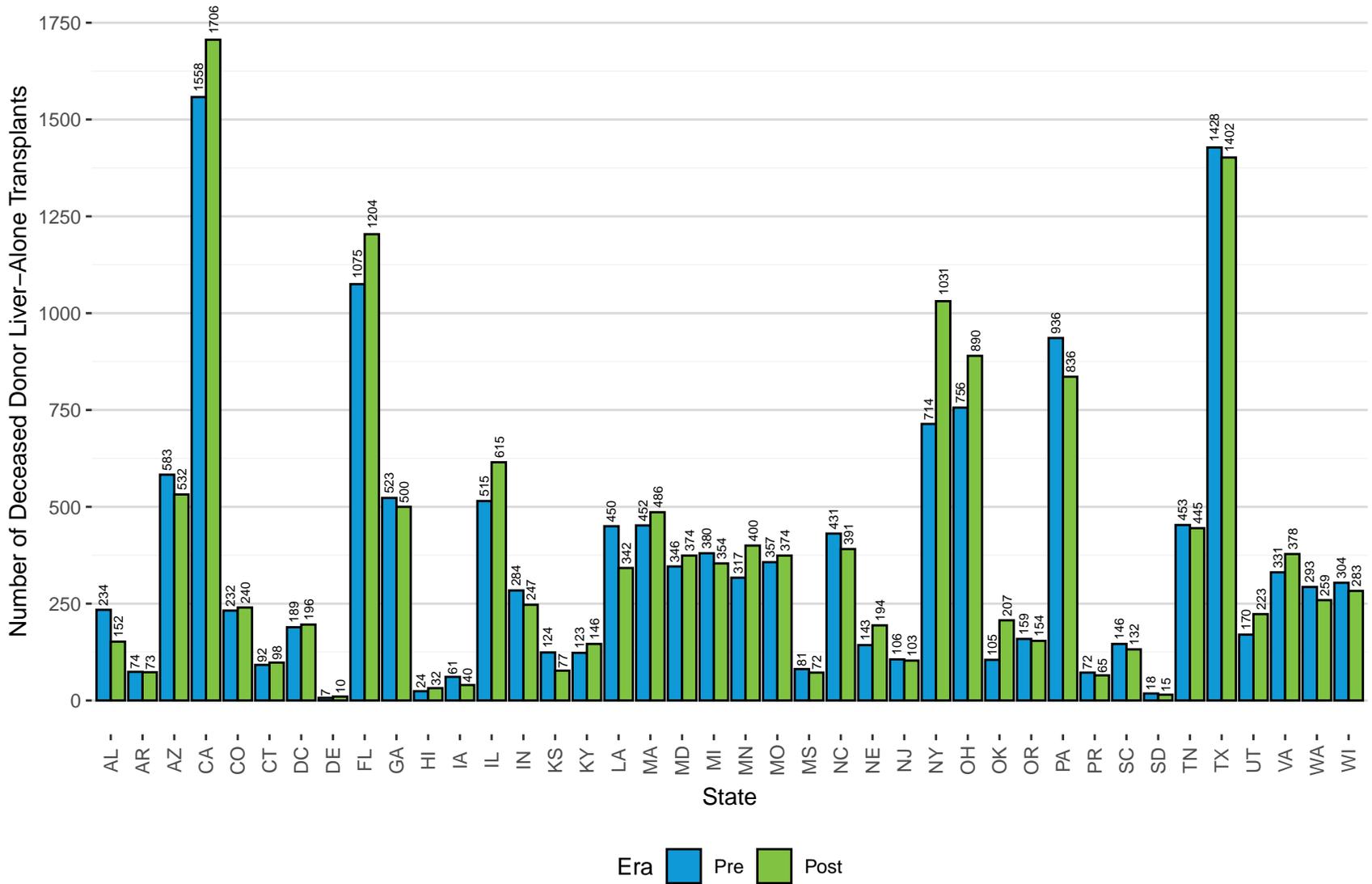
*(continued)*

DSA	Pre-Policy	Post-Policy
VATB	331 (2.3%)	378 (2.5%)
WALC	293 (2.0%)	259 (1.7%)
WIDN	107 (0.7%)	95 (0.6%)
WIUW	197 (1.3%)	188 (1.2%)
Total	14646 (100.0%)	15278 (100.0%)

**Table 87. Number of Deceased Donor Liver-Alone Transplants by State and Era**

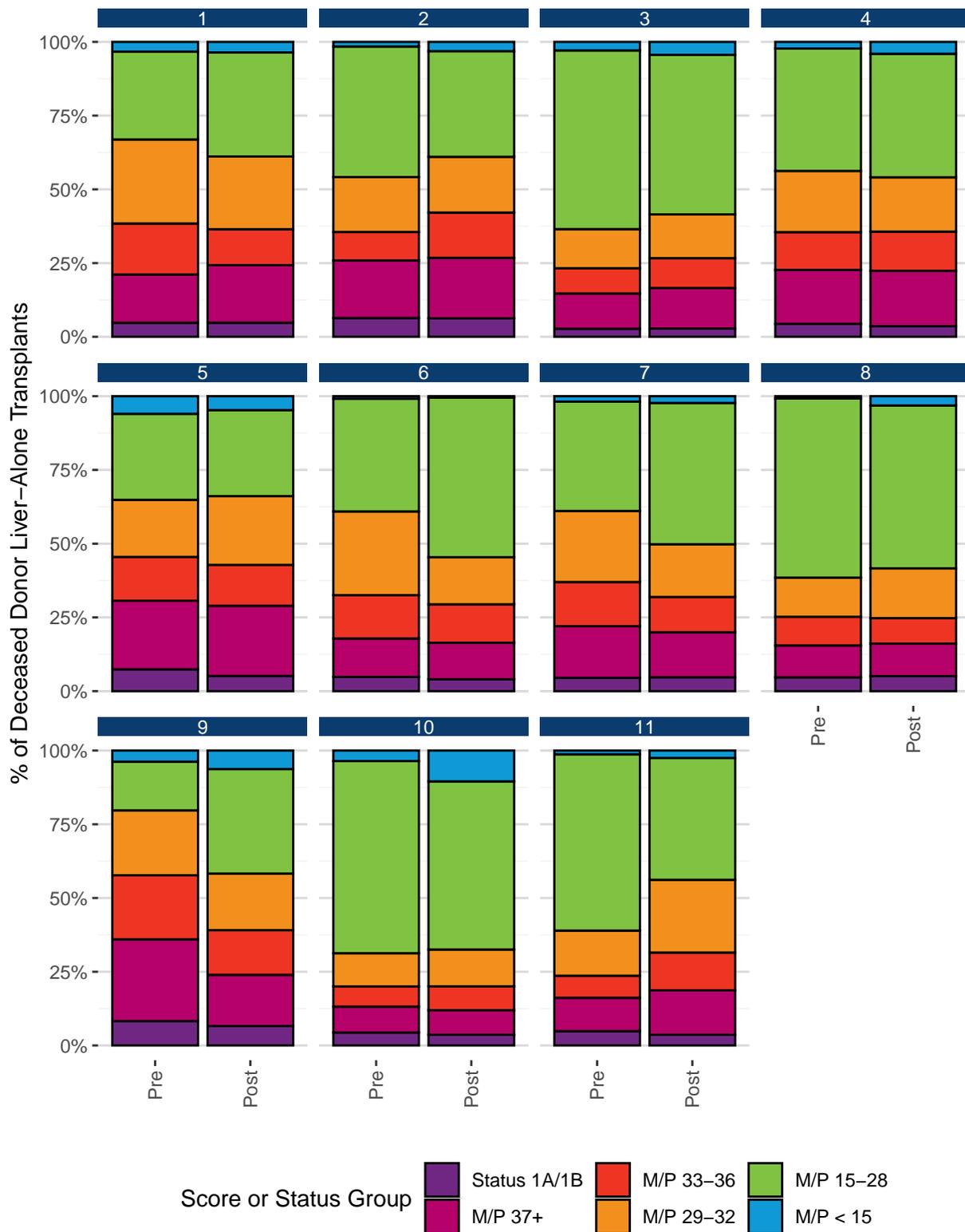
State	Pre-Policy	Post-Policy
AL	234 (1.6%)	152 (1.0%)
AR	74 (0.5%)	73 (0.5%)
AZ	583 (4.0%)	532 (3.5%)
CA	1558 (10.6%)	1706 (11.2%)
CO	232 (1.6%)	240 (1.6%)
CT	92 (0.6%)	98 (0.6%)
DC	189 (1.3%)	196 (1.3%)
DE	7 (0.0%)	10 (0.1%)
FL	1075 (7.3%)	1204 (7.9%)
GA	523 (3.6%)	500 (3.3%)
HI	24 (0.2%)	32 (0.2%)
IA	61 (0.4%)	40 (0.3%)
IL	515 (3.5%)	615 (4.0%)
IN	284 (1.9%)	247 (1.6%)
KS	124 (0.8%)	77 (0.5%)
KY	123 (0.8%)	146 (1.0%)
LA	450 (3.1%)	342 (2.2%)
MA	452 (3.1%)	486 (3.2%)
MD	346 (2.4%)	374 (2.4%)
MI	380 (2.6%)	354 (2.3%)
MN	317 (2.2%)	400 (2.6%)
MO	357 (2.4%)	374 (2.4%)
MS	81 (0.6%)	72 (0.5%)
NC	431 (2.9%)	391 (2.6%)
NE	143 (1.0%)	194 (1.3%)
NJ	106 (0.7%)	103 (0.7%)
NY	714 (4.9%)	1031 (6.7%)
OH	756 (5.2%)	890 (5.8%)
OK	105 (0.7%)	207 (1.4%)
OR	159 (1.1%)	154 (1.0%)
PA	936 (6.4%)	836 (5.5%)
PR	72 (0.5%)	65 (0.4%)
SC	146 (1.0%)	132 (0.9%)
SD	18 (0.1%)	15 (0.1%)
TN	453 (3.1%)	445 (2.9%)
TX	1428 (9.8%)	1402 (9.2%)
UT	170 (1.2%)	223 (1.5%)
VA	331 (2.3%)	378 (2.5%)
WA	293 (2.0%)	259 (1.7%)
WI	304 (2.1%)	283 (1.9%)
Total	14646 (100.0%)	15278 (100.0%)

**Figure 93. Number of Deceased Donor Liver-Alone Transplants by State and Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Figure 94. Deceased Donor Liver-Alone Transplants by MELD or PELD Score or Status, OPTN Region, and Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 87. Number of Deceased Donor Liver-Alone Transplants by Allocation MELD or PELD Score or Status, OPTN Region, and Era**

OPTN Region	Score or Status Group	Pre-Policy	Post-Policy
1	Status 1A/1B	26 (4.8%)	28 (4.8%)
	M/P 37+	89 (16.4%)	114 (19.5%)
	M/P 33-36	94 (17.3%)	71 (12.2%)
	M/P 29-32	155 (28.5%)	144 (24.7%)
	M/P 15-28	162 (29.8%)	206 (35.3%)
	M/P < 15	18 (3.3%)	21 (3.6%)
	Total	544 (100.0%)	584 (100.0%)
	2	Status 1A/1B	101 (6.4%)
M/P 37+		309 (19.5%)	312 (20.5%)
M/P 33-36		153 (9.7%)	233 (15.3%)
M/P 29-32		295 (18.6%)	287 (18.9%)
M/P 15-28		701 (44.3%)	544 (35.8%)
M/P < 15		25 (1.6%)	48 (3.2%)
Total		1584 (100.0%)	1519 (100.0%)
3		Status 1A/1B	68 (2.7%)
	M/P 37+	301 (12.0%)	332 (13.8%)
	M/P 33-36	215 (8.6%)	243 (10.1%)
	M/P 29-32	332 (13.2%)	357 (14.8%)
	M/P 15-28	1520 (60.6%)	1303 (54.1%)
	M/P < 15	73 (2.9%)	106 (4.4%)
	Total	2509 (100.0%)	2408 (100.0%)
	4	Status 1A/1B	67 (4.4%)
M/P 37+		281 (18.3%)	302 (18.8%)
M/P 33-36		196 (12.8%)	214 (13.3%)
M/P 29-32		318 (20.7%)	296 (18.4%)
M/P 15-28		636 (41.5%)	674 (41.9%)
M/P < 15		35 (2.3%)	65 (4.0%)
Total		1533 (100.0%)	1609 (100.0%)
5		Status 1A/1B	171 (7.4%)
	M/P 37+	537 (23.2%)	585 (23.8%)
	M/P 33-36	344 (14.9%)	342 (13.9%)
	M/P 29-32	447 (19.3%)	573 (23.3%)
	M/P 15-28	674 (29.2%)	718 (29.2%)
	M/P < 15	138 (6.0%)	116 (4.7%)
	Total	2311 (100.0%)	2461 (100.0%)

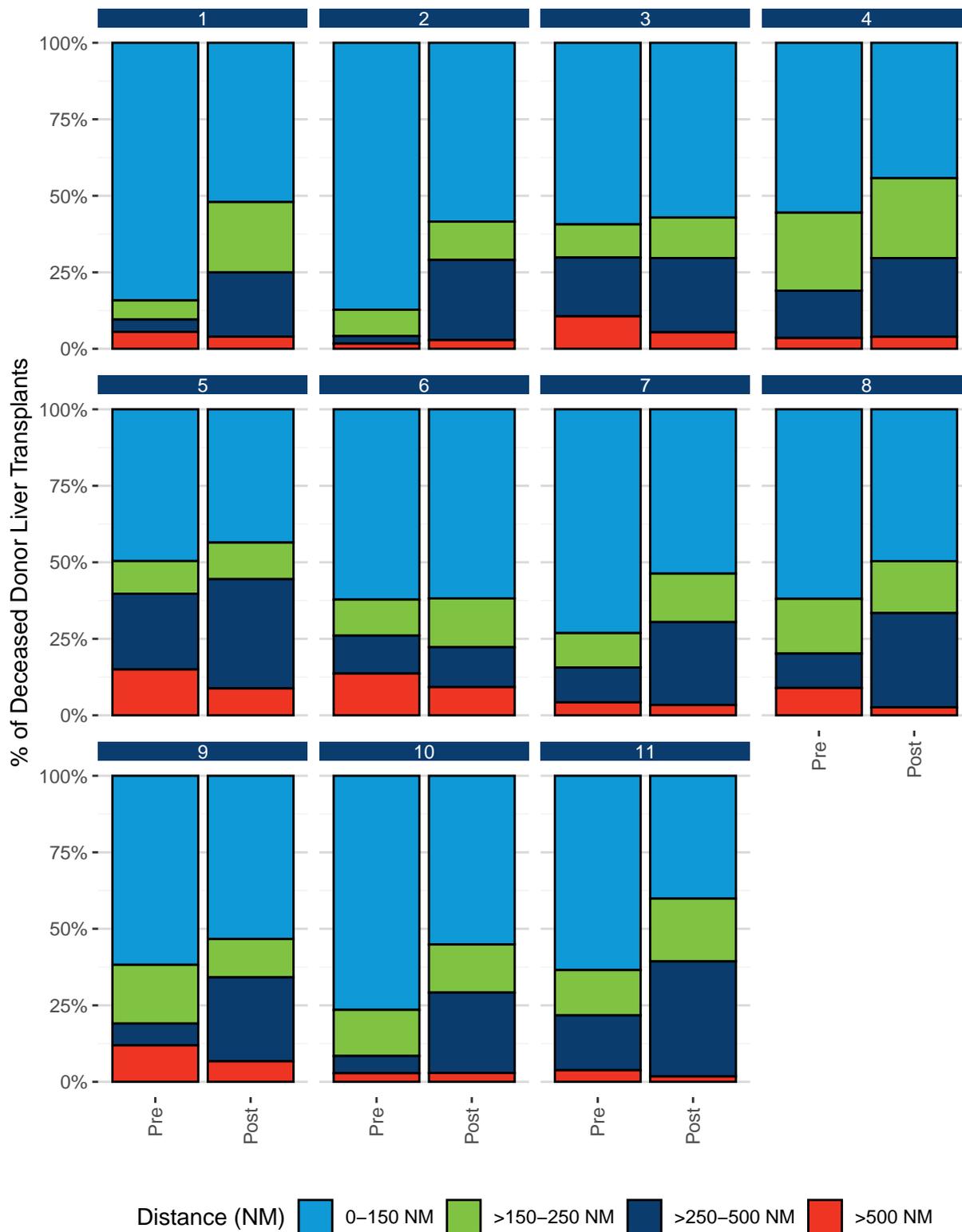
*(continued)*

OPTN Region	Score or Status Group	Pre-Policy	Post-Policy
6	Status 1A/1B	23 (4.8%)	18 (4.0%)
	M/P 37+	62 (13.0%)	55 (12.4%)
	M/P 33-36	70 (14.7%)	58 (13.0%)
	M/P 29-32	135 (28.4%)	71 (16.0%)
	M/P 15-28	182 (38.2%)	241 (54.2%)
	M/P < 15	4 (0.8%)	2 (0.4%)
	Total	476 (100.0%)	445 (100.0%)
	7	Status 1A/1B	52 (4.5%)
M/P 37+		202 (17.5%)	200 (15.2%)
M/P 33-36		173 (15.0%)	157 (12.0%)
M/P 29-32		278 (24.1%)	235 (17.9%)
M/P 15-28		428 (37.1%)	629 (47.9%)
M/P < 15		21 (1.8%)	30 (2.3%)
Total		1154 (100.0%)	1313 (100.0%)
8		Status 1A/1B	43 (4.7%)
	M/P 37+	99 (10.8%)	102 (11.0%)
	M/P 33-36	89 (9.7%)	80 (8.6%)
	M/P 29-32	122 (13.3%)	156 (16.9%)
	M/P 15-28	557 (60.7%)	511 (55.2%)
	M/P < 15	7 (0.8%)	29 (3.1%)
	Total	917 (100.0%)	925 (100.0%)
	9	Status 1A/1B	59 (8.3%)
M/P 37+		198 (27.7%)	179 (17.4%)
M/P 33-36		155 (21.7%)	156 (15.1%)
M/P 29-32		157 (22.0%)	198 (19.2%)
M/P 15-28		118 (16.5%)	365 (35.4%)
M/P < 15		27 (3.8%)	65 (6.3%)
Total		714 (100.0%)	1031 (100.0%)
10		Status 1A/1B	62 (4.4%)
	M/P 37+	125 (8.8%)	124 (8.3%)
	M/P 33-36	97 (6.8%)	121 (8.1%)
	M/P 29-32	160 (11.3%)	186 (12.5%)
	M/P 15-28	925 (65.1%)	850 (57.0%)
	M/P < 15	51 (3.6%)	156 (10.5%)
	Total	1420 (100.0%)	1491 (100.0%)
		Status 1A/1B	72 (4.9%)
	M/P 37+	168 (11.3%)	225 (15.1%)

*(continued)*

OPTN Region	Score or Status Group	Pre-Policy	Post-Policy
11	M/P 33-36	111 (7.5%)	191 (12.8%)
	M/P 29-32	227 (15.3%)	368 (24.7%)
	M/P 15-28	887 (59.8%)	616 (41.3%)
	M/P < 15	19 (1.3%)	38 (2.5%)
	Total	1484 (100.0%)	1492 (100.0%)

**Figure 95. Deceased Donor Liver-Alone Transplants by Classification Distance, OPTN Region, and Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 88. Number of Deceased Donor Liver-Alone Transplants by Classification Distance, OPTN Region, and Era**

OPTN Region	Classification Distance	Pre-Policy	Post-Policy
1	0-150 NM	458 (84.2%)	304 (52.1%)
	>150-250 NM	34 (6.2%)	134 (22.9%)
	>250-500 NM	22 (4.0%)	123 (21.1%)
	>500 NM	30 (5.5%)	23 (3.9%)
	Total	544 (100.0%)	584 (100.0%)
2	0-150 NM	1382 (87.2%)	888 (58.5%)
	>150-250 NM	136 (8.6%)	190 (12.5%)
	>250-500 NM	39 (2.5%)	398 (26.2%)
	>500 NM	27 (1.7%)	43 (2.8%)
	Total	1584 (100.0%)	1519 (100.0%)
3	0-150 NM	1489 (59.3%)	1375 (57.1%)
	>150-250 NM	272 (10.8%)	319 (13.2%)
	>250-500 NM	482 (19.2%)	584 (24.3%)
	>500 NM	266 (10.6%)	130 (5.4%)
	Total	2509 (100.0%)	2408 (100.0%)
4	0-150 NM	851 (55.5%)	712 (44.3%)
	>150-250 NM	391 (25.5%)	420 (26.1%)
	>250-500 NM	237 (15.5%)	414 (25.7%)
	>500 NM	54 (3.5%)	63 (3.9%)
	Total	1533 (100.0%)	1609 (100.0%)
5	0-150 NM	1146 (49.6%)	1072 (43.6%)
	>150-250 NM	247 (10.7%)	294 (11.9%)
	>250-500 NM	572 (24.8%)	879 (35.7%)
	>500 NM	346 (15.0%)	216 (8.8%)
	Total	2311 (100.0%)	2461 (100.0%)
6	0-150 NM	296 (62.2%)	275 (61.8%)
	>150-250 NM	56 (11.8%)	71 (16.0%)
	>250-500 NM	59 (12.4%)	58 (13.0%)
	>500 NM	65 (13.7%)	41 (9.2%)
	Total	476 (100.0%)	445 (100.0%)
7	0-150 NM	844 (73.1%)	705 (53.7%)
	>150-250 NM	130 (11.3%)	208 (15.8%)
	>250-500 NM	131 (11.4%)	356 (27.1%)
	>500 NM	49 (4.2%)	44 (3.4%)
	Total	1154 (100.0%)	1313 (100.0%)

*(continued)*

OPTN Region	Classification Distance	Pre-Policy	Post-Policy
8	0-150 NM	568 (61.9%)	459 (49.6%)
	>150-250 NM	164 (17.9%)	157 (17.0%)
	>250-500 NM	103 (11.2%)	285 (30.8%)
	>500 NM	82 (8.9%)	24 (2.6%)
	Total	917 (100.0%)	925 (100.0%)
9	0-150 NM	441 (61.8%)	550 (53.3%)
	>150-250 NM	137 (19.2%)	129 (12.5%)
	>250-500 NM	51 (7.1%)	283 (27.4%)
	>500 NM	85 (11.9%)	69 (6.7%)
	Total	714 (100.0%)	1031 (100.0%)
10	0-150 NM	1086 (76.5%)	822 (55.1%)
	>150-250 NM	214 (15.1%)	234 (15.7%)
	>250-500 NM	80 (5.6%)	392 (26.3%)
	>500 NM	40 (2.8%)	43 (2.9%)
	Total	1420 (100.0%)	1491 (100.0%)
11	0-150 NM	942 (63.5%)	599 (40.1%)
	>150-250 NM	220 (14.8%)	306 (20.5%)
	>250-500 NM	266 (17.9%)	561 (37.6%)
	>500 NM	56 (3.8%)	26 (1.7%)
	Total	1484 (100.0%)	1492 (100.0%)

**Additional Adult Deceased Donor Liver-Alone Transplant Information****Table 89. Number of Adult Deceased Donor Liver-Alone Transplants by Transplant Program and Era**

Transplant Program	Pre-Policy	Post-Policy
ALUA-TX1	224 (1.6%)	148 (1.0%)
ARUA-TX1	74 (0.5%)	73 (0.5%)
AZCH-TX1	0 (0.0%)	1 (0.0%)
AZGS-TX1	242 (1.8%)	124 (0.9%)
AZMC-TX1	263 (1.9%)	330 (2.3%)
AZSJ-TX1	49 (0.4%)	52 (0.4%)
AZUA-TX1	14 (0.1%)	14 (0.1%)
CACL-TX1	3 (0.0%)	1 (0.0%)
CACS-TX1	174 (1.3%)	174 (1.2%)
CAGH-TX1	52 (0.4%)	50 (0.3%)
CALL-TX1	175 (1.3%)	192 (1.3%)
CAMB-TX1	1 (0.0%)	0 (0.0%)
CAPC-TX1	3 (0.0%)	1 (0.0%)
CAPM-TX1	102 (0.7%)	112 (0.8%)
CASD-TX1	84 (0.6%)	153 (1.1%)
CASF-TX1	250 (1.8%)	252 (1.7%)
CASU-TX1	129 (0.9%)	184 (1.3%)
CASV-TX1	13 (0.1%)	0 (0.0%)
CAUC-TX1	270 (2.0%)	251 (1.7%)
CAUH-TX1	170 (1.2%)	227 (1.6%)
COPM-TX1	6 (0.0%)	13 (0.1%)
COSL-TX1	23 (0.2%)	36 (0.2%)
COUC-TX1	189 (1.4%)	181 (1.2%)
CTHH-TX1	47 (0.3%)	52 (0.4%)
CTYN-TX1	42 (0.3%)	43 (0.3%)
DCGU-TX1	164 (1.2%)	176 (1.2%)
FLBC-TX1	24 (0.2%)	28 (0.2%)
FLCC-TX1	107 (0.8%)	57 (0.4%)
FLFH-TX1	116 (0.8%)	85 (0.6%)
FLJM-TX1	185 (1.3%)	238 (1.6%)
FLLM-TX1	33 (0.2%)	20 (0.1%)
FLSL-TX1	297 (2.2%)	266 (1.8%)
FLTG-TX1	218 (1.6%)	267 (1.8%)
FLUF-TX1	53 (0.4%)	199 (1.4%)
GAEH-TX1	5 (0.0%)	1 (0.0%)
GAEM-TX1	241 (1.7%)	197 (1.4%)
GAPH-TX1	230 (1.7%)	264 (1.8%)
HIQM-TX1	24 (0.2%)	32 (0.2%)
IAIV-TX1	61 (0.4%)	40 (0.3%)
ILCM-TX1	1 (0.0%)	0 (0.0%)
ILLU-TX1	114 (0.8%)	135 (0.9%)
ILNM-TX1	168 (1.2%)	175 (1.2%)
ILPL-TX1	58 (0.4%)	71 (0.5%)
ILUC-TX1	65 (0.5%)	103 (0.7%)
ILUI-TX1	85 (0.6%)	105 (0.7%)

*(continued)*

Transplant Program	Pre-Policy	Post-Policy
INIM-TX1	258 (1.9%)	233 (1.6%)
KSUK-TX1	124 (0.9%)	77 (0.5%)
KYJH-TX1	44 (0.3%)	34 (0.2%)
KYUK-TX1	79 (0.6%)	112 (0.8%)
LAOF-TX1	378 (2.7%)	283 (2.0%)
LATU-TX1	36 (0.3%)	36 (0.2%)
LAWK-TX1	32 (0.2%)	16 (0.1%)
MABI-TX1	65 (0.5%)	71 (0.5%)
MACH-TX1	2 (0.0%)	3 (0.0%)
MALC-TX1	132 (1.0%)	120 (0.8%)
MAMG-TX1	135 (1.0%)	140 (1.0%)
MAUM-TX1	107 (0.8%)	132 (0.9%)
MDJH-TX1	177 (1.3%)	198 (1.4%)
MDUM-TX1	160 (1.2%)	169 (1.2%)
MIBH-TX1	49 (0.4%)	39 (0.3%)
MIHF-TX1	171 (1.2%)	163 (1.1%)
MIUM-TX1	133 (1.0%)	135 (0.9%)
MNMC-TX1	157 (1.1%)	217 (1.5%)
MNUM-TX1	128 (0.9%)	159 (1.1%)
MOBH-TX1	210 (1.5%)	244 (1.7%)
MOCH-TX1	1 (0.0%)	0 (0.0%)
MOCM-TX1	1 (0.0%)	0 (0.0%)
MOLH-TX1	43 (0.3%)	49 (0.3%)
MOSL-TX1	62 (0.5%)	51 (0.4%)
MSUM-TX1	81 (0.6%)	72 (0.5%)
NCCM-TX1	152 (1.1%)	140 (1.0%)
NCDU-TX1	175 (1.3%)	174 (1.2%)
NCMH-TX1	72 (0.5%)	57 (0.4%)
NEUN-TX1	131 (1.0%)	180 (1.2%)
NJLL-TX1	21 (0.2%)	29 (0.2%)
NJUH-TX1	85 (0.6%)	74 (0.5%)
NYCP-TX1	85 (0.6%)	143 (1.0%)
NYFL-TX1	80 (0.6%)	160 (1.1%)
NYMA-TX1	74 (0.5%)	76 (0.5%)
NYMS-TX1	186 (1.4%)	266 (1.8%)
NYNS-TX1	1 (0.0%)	17 (0.1%)
NYNY-TX1	95 (0.7%)	100 (0.7%)
NYUC-TX1	86 (0.6%)	85 (0.6%)
NYWC-TX1	61 (0.4%)	129 (0.9%)
OHCC-TX1	206 (1.5%)	275 (1.9%)
OHCH-TX1	1 (0.0%)	0 (0.0%)
OHCM-TX1	3 (0.0%)	7 (0.0%)
OHOU-TX1	232 (1.7%)	255 (1.8%)
OHUC-TX1	233 (1.7%)	259 (1.8%)
OHUH-TX1	36 (0.3%)	37 (0.3%)
OKBC-TX1	99 (0.7%)	158 (1.1%)
OKMD-TX1	4 (0.0%)	46 (0.3%)

*(continued)*

Transplant Program	Pre-Policy	Post-Policy
ORUO-TX1	116 (0.8%)	120 (0.8%)
ORVA-TX1	43 (0.3%)	34 (0.2%)
PAAE-TX1	121 (0.9%)	119 (0.8%)
PAAG-TX1	80 (0.6%)	71 (0.5%)
PACH-TX1	9 (0.1%)	4 (0.0%)
PAGM-TX1	32 (0.2%)	18 (0.1%)
PAHE-TX1	48 (0.3%)	20 (0.1%)
PAHM-TX1	14 (0.1%)	0 (0.0%)
PAPT-TX1	95 (0.7%)	95 (0.7%)
PARH-TX1	0 (0.0%)	3 (0.0%)
PATJ-TX1	156 (1.1%)	151 (1.0%)
PATU-TX1	19 (0.1%)	19 (0.1%)
PAUP-TX1	226 (1.6%)	226 (1.6%)
PAVA-TX1	86 (0.6%)	46 (0.3%)
PRSJ-TX1	70 (0.5%)	58 (0.4%)
SCMU-TX1	136 (1.0%)	119 (0.8%)
SDMK-TX1	18 (0.1%)	15 (0.1%)
TNMH-TX1	190 (1.4%)	204 (1.4%)
TNVU-TX1	230 (1.7%)	220 (1.5%)
TXAS-TX1	82 (0.6%)	81 (0.6%)
TXBC-TX1	136 (1.0%)	133 (0.9%)
TXHH-TX1	53 (0.4%)	46 (0.3%)
TXHI-TX1	149 (1.1%)	148 (1.0%)
TXHS-TX1	86 (0.6%)	124 (0.9%)
TXJS-TX1	36 (0.3%)	29 (0.2%)
TXMC-TX1	138 (1.0%)	123 (0.8%)
TXMH-TX1	244 (1.8%)	311 (2.1%)
TXPL-TX1	1 (0.0%)	0 (0.0%)
TXSP-TX1	194 (1.4%)	187 (1.3%)
TXTC-TX1	4 (0.0%)	3 (0.0%)
TXTX-TX1	177 (1.3%)	108 (0.7%)
TXVA-TX1	27 (0.2%)	10 (0.1%)
UTLD-TX1	90 (0.7%)	149 (1.0%)
UTMC-TX1	54 (0.4%)	61 (0.4%)
UTPC-TX1	0 (0.0%)	1 (0.0%)
VAMC-TX1	148 (1.1%)	250 (1.7%)
VAUV-TX1	168 (1.2%)	123 (0.8%)
WACH-TX1	0 (0.0%)	1 (0.0%)
WASM-TX1	75 (0.5%)	50 (0.3%)
WAUW-TX1	195 (1.4%)	189 (1.3%)
WICH-TX1	0 (0.0%)	1 (0.0%)
WISE-TX1	48 (0.3%)	49 (0.3%)
WISL-TX1	52 (0.4%)	43 (0.3%)
WIUW-TX1	196 (1.4%)	184 (1.3%)
Total	13773 (100.0%)	14489 (100.0%)

**Table 90. Number of Adult Deceased Donor Liver-Alone Transplants by Transplant Program DSA and Era**

DSA	Pre-Policy	Post-Policy
ALOB	224 (1.6%)	148 (1.0%)
AROR	74 (0.5%)	73 (0.5%)
AZOB	568 (4.1%)	521 (3.6%)
CADN	485 (3.5%)	549 (3.8%)
CAOP	805 (5.8%)	845 (5.8%)
CASD	136 (1.0%)	203 (1.4%)
CORS	218 (1.6%)	230 (1.6%)
DCTC	164 (1.2%)	176 (1.2%)
FLFH	116 (0.8%)	85 (0.6%)
FLMP	316 (2.3%)	323 (2.2%)
FLUF	350 (2.5%)	465 (3.2%)
FLWC	251 (1.8%)	287 (2.0%)
GALL	476 (3.5%)	462 (3.2%)
HIOP	24 (0.2%)	32 (0.2%)
IAOP	61 (0.4%)	40 (0.3%)
ILIP	491 (3.6%)	589 (4.1%)
INOP	258 (1.9%)	233 (1.6%)
KYDA	123 (0.9%)	146 (1.0%)
LAOP	446 (3.2%)	335 (2.3%)
MAOB	530 (3.8%)	561 (3.9%)
MDPC	337 (2.4%)	367 (2.5%)
MIOP	353 (2.6%)	337 (2.3%)
MNOP	303 (2.2%)	391 (2.7%)
MOMA	273 (2.0%)	295 (2.0%)
MSOP	81 (0.6%)	72 (0.5%)
MWOB	168 (1.2%)	126 (0.9%)
NCCM	152 (1.1%)	140 (1.0%)
NCNC	247 (1.8%)	231 (1.6%)
NEOR	131 (1.0%)	180 (1.2%)
NJTO	106 (0.8%)	103 (0.7%)
NYFL	80 (0.6%)	160 (1.1%)
NYRT	588 (4.3%)	816 (5.6%)
OHLB	242 (1.8%)	312 (2.2%)
OHLP	233 (1.7%)	255 (1.8%)
OHOV	236 (1.7%)	266 (1.8%)
OKOP	103 (0.7%)	204 (1.4%)
ORUO	159 (1.2%)	154 (1.1%)
PADV	616 (4.5%)	556 (3.8%)
PATF	270 (2.0%)	216 (1.5%)
PRLL	70 (0.5%)	58 (0.4%)
SCOP	136 (1.0%)	119 (0.8%)
TNDS	230 (1.7%)	220 (1.5%)
TNMS	190 (1.4%)	204 (1.4%)
TXGC	560 (4.1%)	599 (4.1%)
TXSA	222 (1.6%)	257 (1.8%)
TXSB	545 (4.0%)	447 (3.1%)

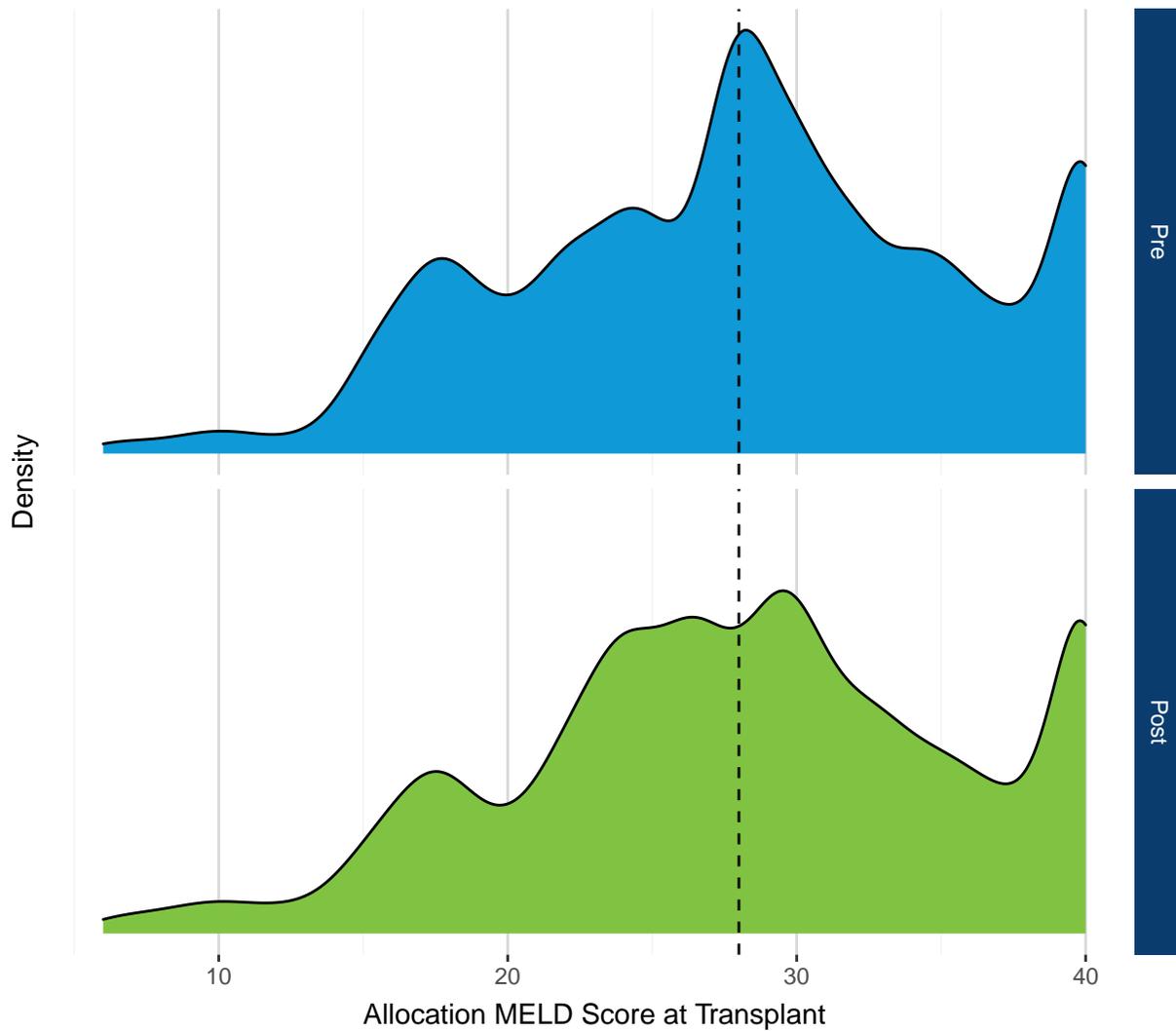
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DSA	Pre-Policy	Post-Policy
UTOP	144 (1.0%)	211 (1.5%)
VATB	316 (2.3%)	373 (2.6%)
WALC	270 (2.0%)	240 (1.7%)
WIDN	100 (0.7%)	93 (0.6%)
WIUW	196 (1.4%)	184 (1.3%)
Total	13773 (100.0%)	14489 (100.0%)

**Table 91. Number of Adult Deceased Donor Liver-Alone Transplants by State and Era**

State	Pre-Policy	Post-Policy
AL	224 (1.6%)	148 (1.0%)
AR	74 (0.5%)	73 (0.5%)
AZ	568 (4.1%)	521 (3.6%)
CA	1426 (10.4%)	1597 (11.0%)
CO	218 (1.6%)	230 (1.6%)
CT	89 (0.6%)	95 (0.7%)
DC	164 (1.2%)	176 (1.2%)
FL	1033 (7.5%)	1160 (8.0%)
GA	476 (3.5%)	462 (3.2%)
HI	24 (0.2%)	32 (0.2%)
IA	61 (0.4%)	40 (0.3%)
IL	491 (3.6%)	589 (4.1%)
IN	258 (1.9%)	233 (1.6%)
KS	124 (0.9%)	77 (0.5%)
KY	123 (0.9%)	146 (1.0%)
LA	446 (3.2%)	335 (2.3%)
MA	441 (3.2%)	466 (3.2%)
MD	337 (2.4%)	367 (2.5%)
MI	353 (2.6%)	337 (2.3%)
MN	285 (2.1%)	376 (2.6%)
MO	317 (2.3%)	344 (2.4%)
MS	81 (0.6%)	72 (0.5%)
NC	399 (2.9%)	371 (2.6%)
NE	131 (1.0%)	180 (1.2%)
NJ	106 (0.8%)	103 (0.7%)
NY	668 (4.9%)	976 (6.7%)
OH	711 (5.2%)	833 (5.7%)
OK	103 (0.7%)	204 (1.4%)
OR	159 (1.2%)	154 (1.1%)
PA	886 (6.4%)	772 (5.3%)
PR	70 (0.5%)	58 (0.4%)
SC	136 (1.0%)	119 (0.8%)
SD	18 (0.1%)	15 (0.1%)
TN	420 (3.0%)	424 (2.9%)
TX	1327 (9.6%)	1303 (9.0%)
UT	144 (1.0%)	211 (1.5%)
VA	316 (2.3%)	373 (2.6%)
WA	270 (2.0%)	240 (1.7%)
WI	296 (2.1%)	277 (1.9%)
Total	13773 (100.0%)	14489 (100.0%)

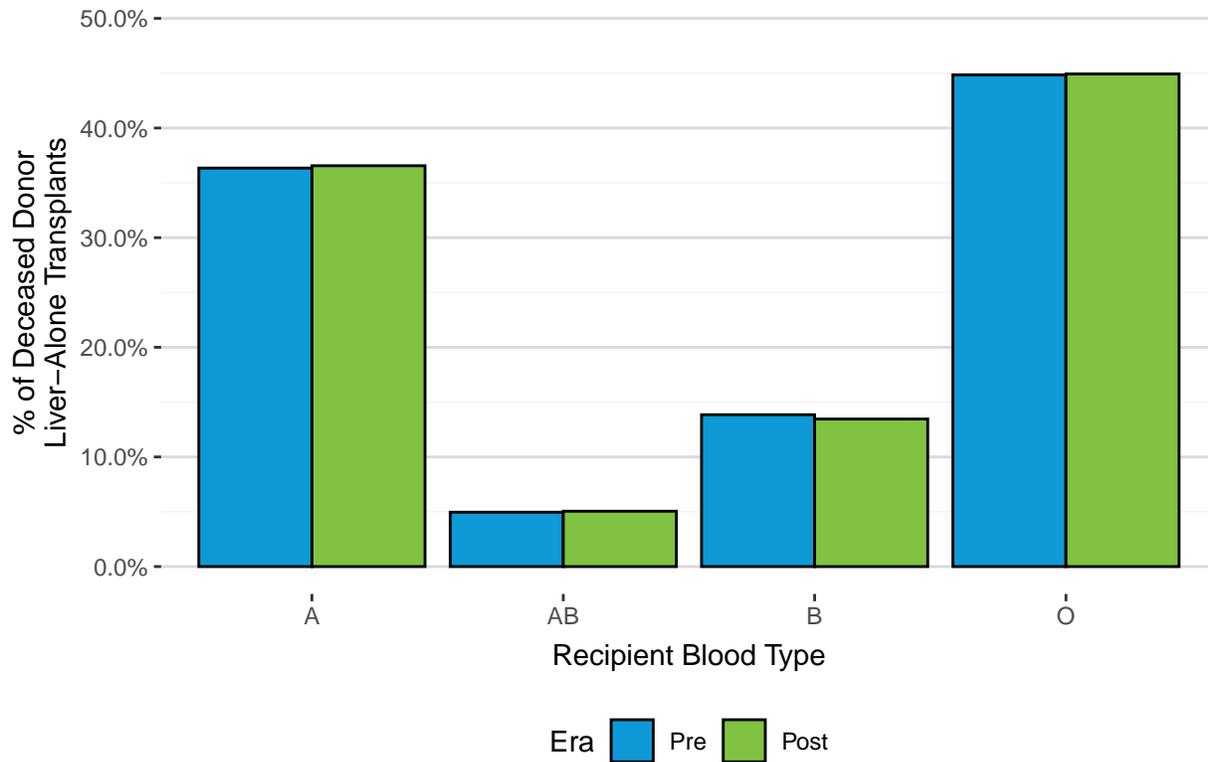
**Figure 96. Distribution of Adult Deceased Donor Liver-Alone Recipient Allocation MELD Score at Transplant by Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.  
 \*\* Dotted lines indicate median score within each era.

**Table 92. Distribution of Adult Deceased Donor Liver-Alone Recipient Allocation MELD Score at Transplant by Era**

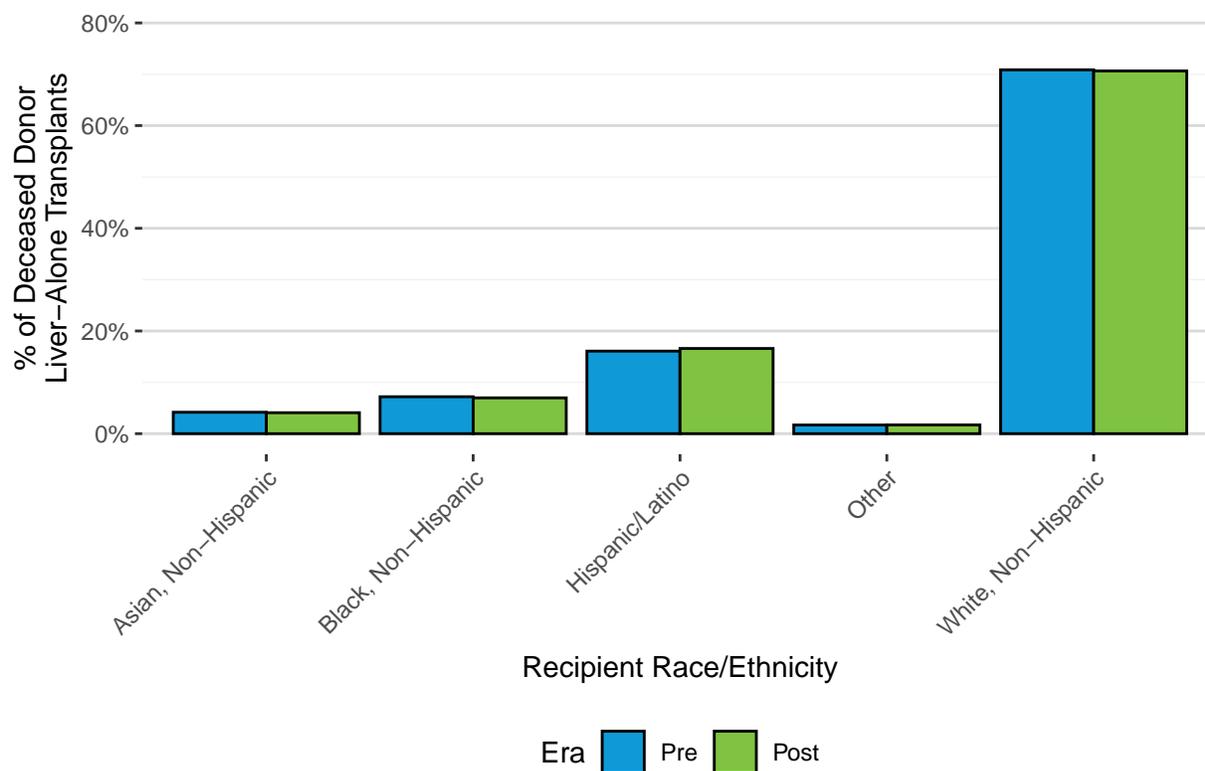
Era	N	Allocation MELD at Transplant					
		Minimum	25th Percentile	Mean	Median	75th Percentile	Maximum
Pre	13361	6	23	28	28	34	40
Post	14087	6	23	28	28	34	40

**Figure 97. Adult Deceased Donor Liver-Alone Transplants by Recipient Blood Type and Era**

National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 93. Number and Percent of Adult Deceased Donor Liver-Alone Transplants by Recipient Blood Type and Era**

Recipient Blood Type	Pre-Policy	Post-Policy
A	5006 (36.3%)	5297 (36.6%)
AB	683 (5.0%)	732 (5.1%)
B	1908 (13.9%)	1950 (13.5%)
O	6176 (44.8%)	6510 (44.9%)
Total	13773 (100.0%)	14489 (100.0%)

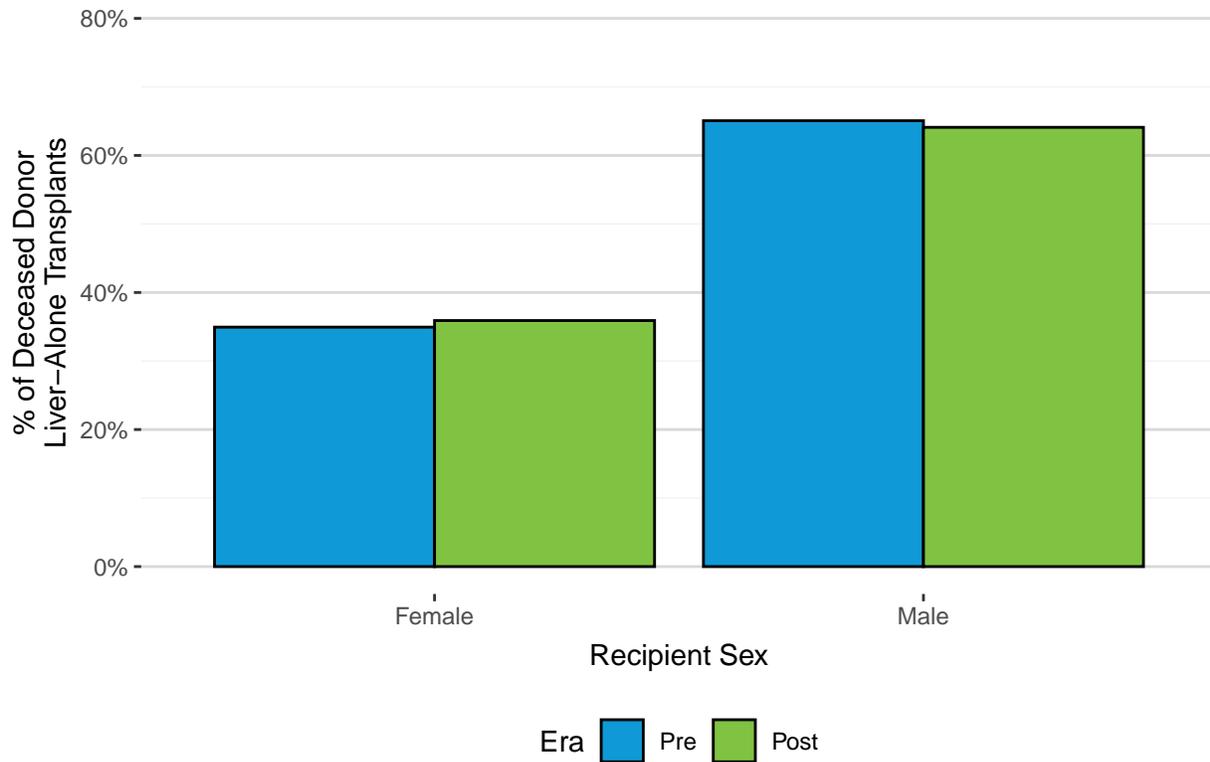
**Figure 98. Adult Deceased Donor Liver-Alone Transplants by Recipient Race/Ethnicity and Era**

National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 94. Number and Percent of Adult Deceased Donor Liver-Alone Transplants by Recipient Race/Ethnicity and Era**

Recipient Race/Ethnicity	Pre-Policy	Post-Policy
Asian, Non-Hispanic	575 (4.2%)	592 (4.1%)
Black, Non-Hispanic	991 (7.2%)	1011 (7.0%)
Hispanic/Latino	2215 (16.1%)	2404 (16.6%)
Other	232 (1.7%)	246 (1.7%)
White, Non-Hispanic	9760 (70.9%)	10236 (70.6%)
Total	13773 (100.0%)	14489 (100.0%)

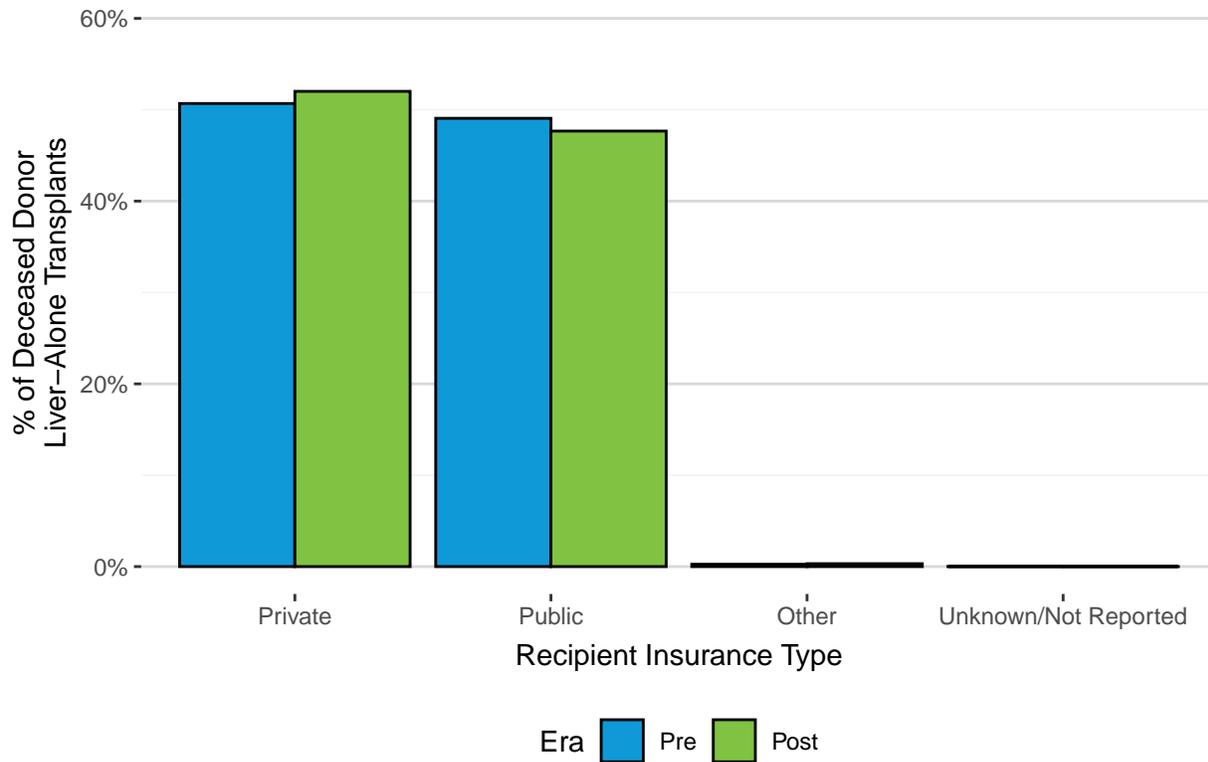
**Figure 99. Adult Deceased Donor Liver-Alone Transplants by Recipient Sex and Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 95. Number and Percent of Adult Deceased Donor Liver-Alone Transplants by Recipient Sex and Era**

Recipient Sex	Pre-Policy	Post-Policy
Female	4812 (34.9%)	5202 (35.9%)
Male	8961 (65.1%)	9287 (64.1%)
Total	13773 (100.0%)	14489 (100.0%)

**Figure 100. Adult Deceased Donor Liver-Alone Transplants by Recipient Insurance Type and Era**

National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 96. Number and Percent of Adult Deceased Donor Liver-Alone Transplants by Recipient Insurance Type and Era**

Recipient Insurance Type	Pre-Policy	Post-Policy
Private	6980 (50.7%)	7536 (52.0%)
Public	6757 (49.1%)	6906 (47.7%)
Other	35 (0.3%)	46 (0.3%)
Unknown/Not Reported	1 (0.0%)	1 (0.0%)
Total	13773 (100.0%)	14489 (100.0%)

**Additional Pediatric Deceased Donor Liver-Alone Transplant Information****Table 97. Number of Pediatric Deceased Donor Liver-Alone Transplants by Transplant Program and Era**

Transplant Program	Pre-Policy	Post-Policy
ALCH-TX1	10 (1.1%)	4 (0.5%)
AZCH-TX1	15 (1.7%)	11 (1.4%)
CACL-TX1	42 (4.8%)	38 (4.8%)
CALL-TX1	1 (0.1%)	0 (0.0%)
CAMB-TX1	18 (2.1%)	11 (1.4%)
CAPC-TX1	46 (5.3%)	35 (4.4%)
CASD-TX1	0 (0.0%)	1 (0.1%)
CAUC-TX1	25 (2.9%)	24 (3.0%)
COCH-TX1	13 (1.5%)	10 (1.3%)
COUC-TX1	1 (0.1%)	0 (0.0%)
CTYN-TX1	3 (0.3%)	3 (0.4%)
DCGU-TX1	25 (2.9%)	20 (2.5%)
DEAI-TX1	7 (0.8%)	10 (1.3%)
FLFH-TX1	7 (0.8%)	21 (2.7%)
FLJM-TX1	35 (4.0%)	23 (2.9%)
GAEH-TX1	46 (5.3%)	38 (4.8%)
GAEM-TX1	1 (0.1%)	0 (0.0%)
ILCM-TX1	23 (2.6%)	19 (2.4%)
ILUC-TX1	1 (0.1%)	7 (0.9%)
INIM-TX1	26 (3.0%)	14 (1.8%)
LACH-TX1	0 (0.0%)	1 (0.1%)
LAOF-TX1	4 (0.5%)	6 (0.8%)
MACH-TX1	10 (1.1%)	20 (2.5%)
MAMG-TX1	1 (0.1%)	0 (0.0%)
MDJH-TX1	8 (0.9%)	7 (0.9%)
MDUM-TX1	1 (0.1%)	0 (0.0%)
MICH-TX1	3 (0.3%)	4 (0.5%)
MIUM-TX1	24 (2.7%)	13 (1.6%)
MNMC-TX1	11 (1.3%)	8 (1.0%)
MNUM-TX1	21 (2.4%)	16 (2.0%)
MOCG-TX1	3 (0.3%)	1 (0.1%)
MOCH-TX1	22 (2.5%)	29 (3.7%)
MOCM-TX1	15 (1.7%)	0 (0.0%)
NCCM-TX1	4 (0.5%)	4 (0.5%)
NCDU-TX1	27 (3.1%)	16 (2.0%)
NCMH-TX1	1 (0.1%)	0 (0.0%)
NEUN-TX1	12 (1.4%)	14 (1.8%)
NYCP-TX1	26 (3.0%)	30 (3.8%)
NYMA-TX1	11 (1.3%)	10 (1.3%)
NYMS-TX1	9 (1.0%)	14 (1.8%)
NYWC-TX1	0 (0.0%)	1 (0.1%)
OHCC-TX1	8 (0.9%)	3 (0.4%)
OHCH-TX1	0 (0.0%)	4 (0.5%)
OHCM-TX1	37 (4.2%)	49 (6.2%)
OHUH-TX1	0 (0.0%)	1 (0.1%)

*(continued)*

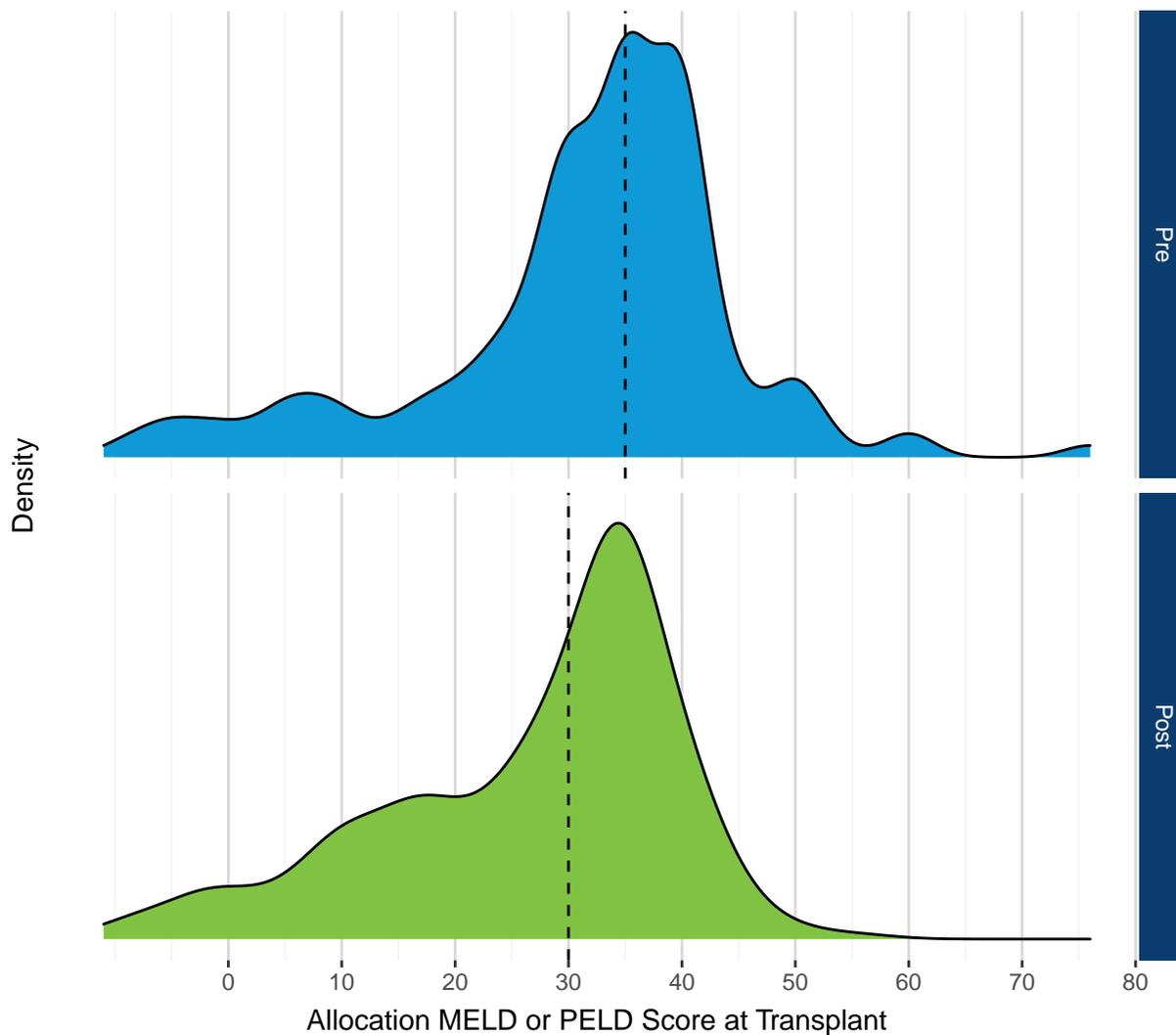
Transplant Program	Pre-Policy	Post-Policy
OKMD-TX1	2 (0.2%)	3 (0.4%)
PACH-TX1	23 (2.6%)	32 (4.1%)
PACP-TX1	26 (3.0%)	32 (4.1%)
PAUP-TX1	1 (0.1%)	0 (0.0%)
PRSJ-TX1	2 (0.2%)	7 (0.9%)
SCMU-TX1	10 (1.1%)	13 (1.6%)
TNLB-TX1	8 (0.9%)	4 (0.5%)
TNVU-TX1	25 (2.9%)	17 (2.2%)
TXBC-TX1	2 (0.2%)	0 (0.0%)
TXCM-TX1	22 (2.5%)	25 (3.2%)
TXHH-TX1	7 (0.8%)	6 (0.8%)
TXTC-TX1	66 (7.6%)	65 (8.2%)
TXTX-TX1	2 (0.2%)	0 (0.0%)
TXUC-TX1	2 (0.2%)	3 (0.4%)
UTPC-TX1	26 (3.0%)	12 (1.5%)
VAMC-TX1	2 (0.2%)	1 (0.1%)
VAUV-TX1	13 (1.5%)	4 (0.5%)
WACH-TX1	23 (2.6%)	19 (2.4%)
WICH-TX1	7 (0.8%)	2 (0.3%)
WIUW-TX1	1 (0.1%)	4 (0.5%)
Total	873 (100.0%)	789 (100.0%)

**Table 98. Number of Pediatric Deceased Donor Liver-Alone Transplants by Transplant Program DSA and Era**

DSA	Pre-Policy	Post-Policy
ALOB	10 (1.1%)	4 (0.5%)
AZOB	15 (1.7%)	11 (1.4%)
CADN	64 (7.3%)	46 (5.8%)
CAOP	68 (7.8%)	62 (7.9%)
CASD	0 (0.0%)	1 (0.1%)
CORS	14 (1.6%)	10 (1.3%)
DCTC	25 (2.9%)	20 (2.5%)
FLFH	7 (0.8%)	21 (2.7%)
FLMP	35 (4.0%)	23 (2.9%)
GALL	47 (5.4%)	38 (4.8%)
ILIP	24 (2.7%)	26 (3.3%)
INOP	26 (3.0%)	14 (1.8%)
LAOP	4 (0.5%)	7 (0.9%)
MAOB	14 (1.6%)	23 (2.9%)
MDPC	9 (1.0%)	7 (0.9%)
MIOP	27 (3.1%)	17 (2.2%)
MNOP	32 (3.7%)	24 (3.0%)
MOMA	25 (2.9%)	30 (3.8%)
MWOB	15 (1.7%)	0 (0.0%)
NCCM	4 (0.5%)	4 (0.5%)
NCNC	28 (3.2%)	16 (2.0%)
NEOR	12 (1.4%)	14 (1.8%)
NYRT	46 (5.3%)	55 (7.0%)
OHLB	8 (0.9%)	4 (0.5%)
OHLP	0 (0.0%)	4 (0.5%)
OHOV	37 (4.2%)	49 (6.2%)
OKOP	2 (0.2%)	3 (0.4%)
PADV	34 (3.9%)	42 (5.3%)
PATF	23 (2.6%)	32 (4.1%)
PRLI	2 (0.2%)	7 (0.9%)
SCOP	10 (1.1%)	13 (1.6%)
TNDS	25 (2.9%)	17 (2.2%)
TNMS	8 (0.9%)	4 (0.5%)
TXGC	73 (8.4%)	71 (9.0%)
TXSA	4 (0.5%)	3 (0.4%)
TXSB	24 (2.7%)	25 (3.2%)
UTOP	26 (3.0%)	12 (1.5%)
VATB	15 (1.7%)	5 (0.6%)
WALC	23 (2.6%)	19 (2.4%)
WIDN	7 (0.8%)	2 (0.3%)
WIUW	1 (0.1%)	4 (0.5%)
Total	873 (100.0%)	789 (100.0%)

**Table 99. Number of Pediatric Deceased Donor Liver-Alone Transplants by State and Era**

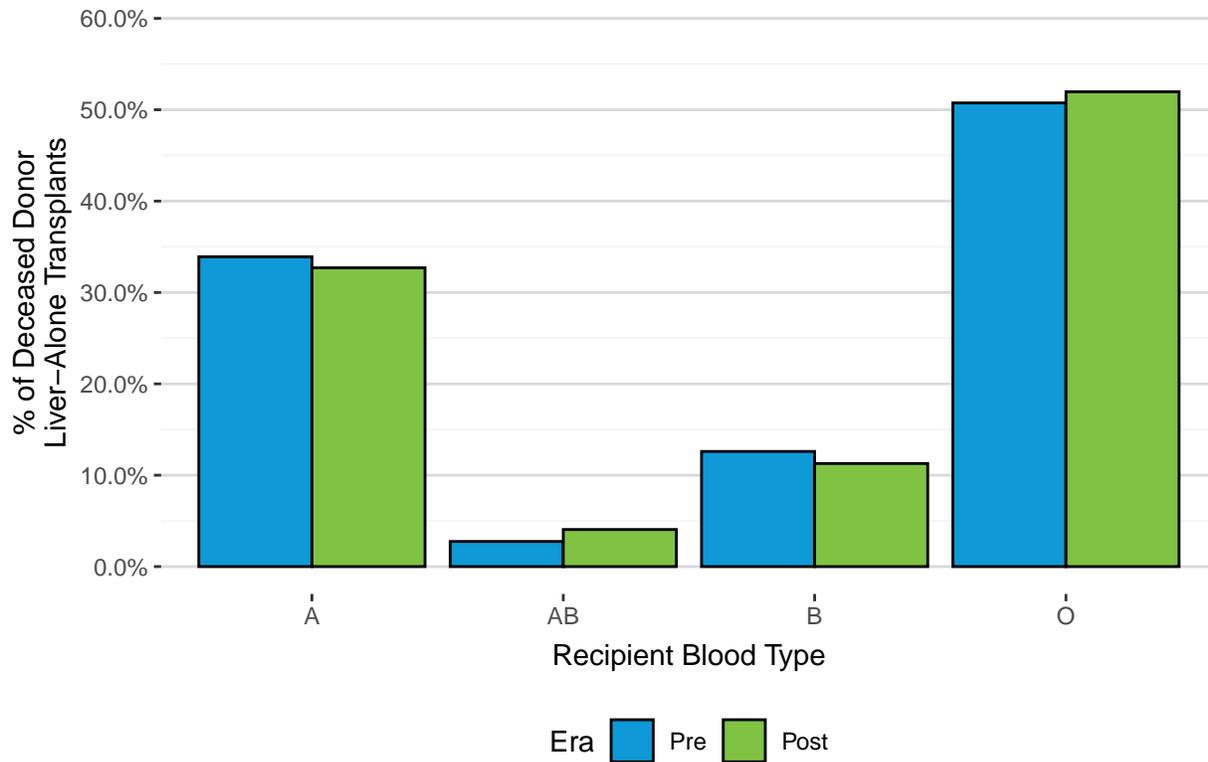
State	Pre-Policy	Post-Policy
AL	10 (1.1%)	4 (0.5%)
AZ	15 (1.7%)	11 (1.4%)
CA	132 (15.1%)	109 (13.8%)
CO	14 (1.6%)	10 (1.3%)
CT	3 (0.3%)	3 (0.4%)
DC	25 (2.9%)	20 (2.5%)
DE	7 (0.8%)	10 (1.3%)
FL	42 (4.8%)	44 (5.6%)
GA	47 (5.4%)	38 (4.8%)
IL	24 (2.7%)	26 (3.3%)
IN	26 (3.0%)	14 (1.8%)
LA	4 (0.5%)	7 (0.9%)
MA	11 (1.3%)	20 (2.5%)
MD	9 (1.0%)	7 (0.9%)
MI	27 (3.1%)	17 (2.2%)
MN	32 (3.7%)	24 (3.0%)
MO	40 (4.6%)	30 (3.8%)
NC	32 (3.7%)	20 (2.5%)
NE	12 (1.4%)	14 (1.8%)
NY	46 (5.3%)	55 (7.0%)
OH	45 (5.2%)	57 (7.2%)
OK	2 (0.2%)	3 (0.4%)
PA	50 (5.7%)	64 (8.1%)
PR	2 (0.2%)	7 (0.9%)
SC	10 (1.1%)	13 (1.6%)
TN	33 (3.8%)	21 (2.7%)
TX	101 (11.6%)	99 (12.5%)
UT	26 (3.0%)	12 (1.5%)
VA	15 (1.7%)	5 (0.6%)
WA	23 (2.6%)	19 (2.4%)
WI	8 (0.9%)	6 (0.8%)
Total	873 (100.0%)	789 (100.0%)

**Figure 101. Distribution of Pediatric Deceased Donor Liver-Alone Recipient Allocation MELD or PELD Score at Transplant by Era**

National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.  
 \*\* Dotted lines indicate median score within each era.

**Table 100. Distribution of Pediatric Deceased Donor Liver-Alone Recipient Allocation MELD or PELD Score at Transplant by Era**

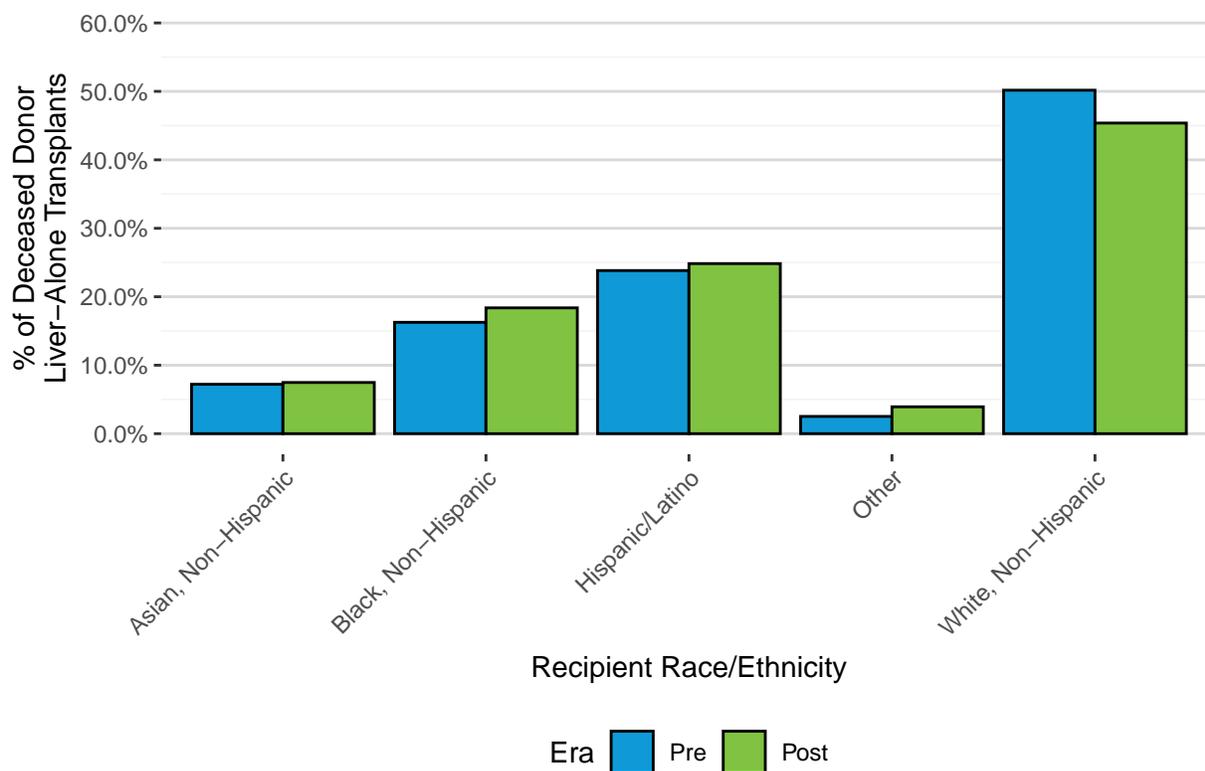
Era	N	Allocation MELD or PELD at Transplant					
		Minimum	25th Percentile	Mean	Median	75th Percentile	Maximum
Pre	541	-10	28	31	35	40	76
Post	513	-11	18	27	30	35	56

**Figure 102. Pediatric Deceased Donor Liver-Alone Transplants by Recipient Blood Type and Era**

National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 101. Number and Percent of Pediatric Deceased Donor Liver-Alone Transplants by Recipient Blood Type and Era**

Recipient Blood Type	Pre-Policy	Post-Policy
A	296 (33.9%)	258 (32.7%)
AB	24 (2.7%)	32 (4.1%)
B	110 (12.6%)	89 (11.3%)
O	443 (50.7%)	410 (52.0%)
Total	873 (100.0%)	789 (100.0%)

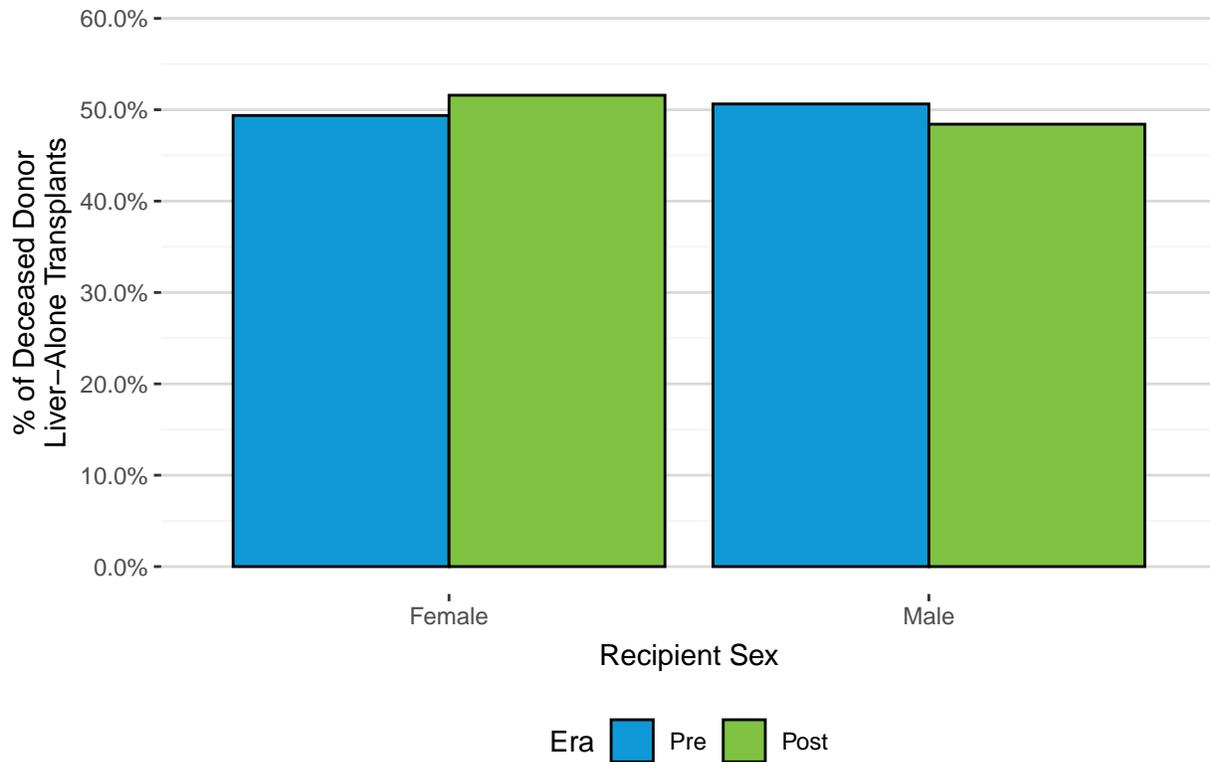
**Figure 103. Pediatric Deceased Donor Liver-Alone Transplants by Recipient Race/Ethnicity and Era**

National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 102. Number and Percent of Pediatric Deceased Donor Liver-Alone Transplants by Recipient Race/Ethnicity and Era**

Recipient Race/Ethnicity	Pre-Policy	Post-Policy
Asian, Non-Hispanic	63 (7.2%)	59 (7.5%)
Black, Non-Hispanic	142 (16.3%)	145 (18.4%)
Hispanic/Latino	208 (23.8%)	196 (24.8%)
Other	22 (2.5%)	31 (3.9%)
White, Non-Hispanic	438 (50.2%)	358 (45.4%)
Total	873 (100.0%)	789 (100.0%)

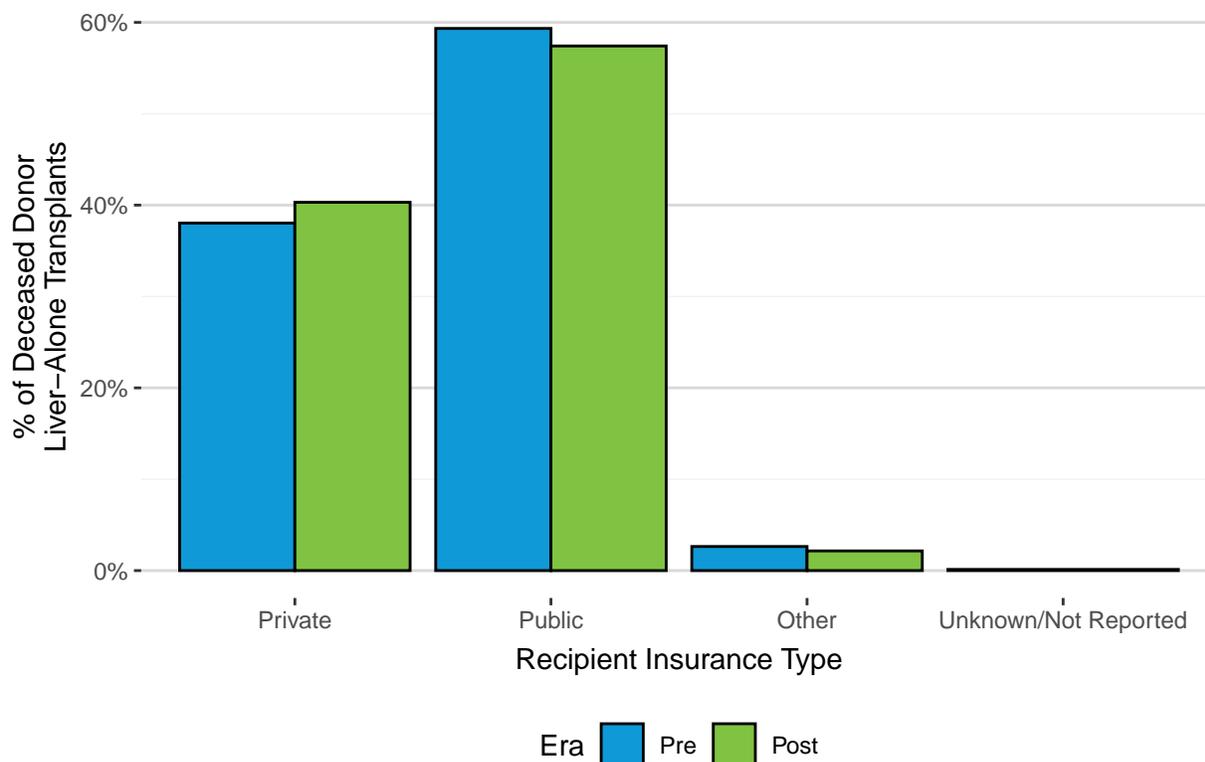
**Figure 104. Pediatric Deceased Donor Liver-Alone Transplants by Recipient Sex and Era**



National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
 Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 103. Number and Percent of Pediatric Deceased Donor Liver-Alone Transplants by Recipient Sex and Era**

Recipient Sex	Pre-Policy	Post-Policy
Female	431 (49.4%)	407 (51.6%)
Male	442 (50.6%)	382 (48.4%)
Total	873 (100.0%)	789 (100.0%)

**Figure 105. Pediatric Deceased Donor Liver-Alone Transplants by Recipient Insurance Type and Era**

National state of emergency declared in US due to COVID-19 pandemic on March 13, 2020.  
Pre-Policy: 02/03/2018 – 02/03/2020; Post-Policy: 02/04/2020 – 02/03/2022.

**Table 104. Number and Percent of Pediatric Deceased Donor Liver-Alone Transplants by Recipient Insurance Type and Era**

Recipient Insurance Type	Pre-Policy	Post-Policy
Private	332 (38.0%)	318 (40.3%)
Public	518 (59.3%)	453 (57.4%)
Other	23 (2.6%)	17 (2.2%)
Unknown/Not Reported	0 (0.0%)	1 (0.1%)
Total	873 (100.0%)	789 (100.0%)

**Additional Utilization Information****Table 105. Number of Deceased Liver Donors Recovered by OPO and Era**

OPO	Pre-Policy	Post-Policy
ALOB	315 (1.8%)	358 (1.9%)
AROR	114 (0.6%)	132 (0.7%)
AZOB	475 (2.7%)	496 (2.6%)
CADN	584 (3.3%)	576 (3.1%)
CAGS	122 (0.7%)	204 (1.1%)
CAOP	913 (5.1%)	879 (4.7%)
CASD	211 (1.2%)	203 (1.1%)
CORS	243 (1.4%)	302 (1.6%)
CTOP	104 (0.6%)	41 (0.2%)
DCTC	235 (1.3%)	196 (1.0%)
FLFH	286 (1.6%)	308 (1.6%)
FLMP	246 (1.4%)	267 (1.4%)
FLUF	310 (1.7%)	358 (1.9%)
FLWC	415 (2.3%)	483 (2.6%)
GALL	546 (3.1%)	537 (2.9%)
HIOP	52 (0.3%)	40 (0.2%)
IAOP	127 (0.7%)	152 (0.8%)
ILIP	716 (4.0%)	657 (3.5%)
INOP	357 (2.0%)	437 (2.3%)
KYDA	200 (1.1%)	269 (1.4%)
LAOP	377 (2.1%)	417 (2.2%)
MAOB	471 (2.6%)	459 (2.4%)
MDPC	259 (1.4%)	248 (1.3%)
MIOP	518 (2.9%)	508 (2.7%)
MNOP	298 (1.7%)	282 (1.5%)
MOMA	336 (1.9%)	374 (2.0%)
MSOP	145 (0.8%)	155 (0.8%)
MWOB	397 (2.2%)	475 (2.5%)
NCCM	188 (1.1%)	214 (1.1%)
NCNC	335 (1.9%)	383 (2.0%)
NEOR	96 (0.5%)	114 (0.6%)
NJTO	285 (1.6%)	307 (1.6%)
NMOP	73 (0.4%)	110 (0.6%)
NVLV	262 (1.5%)	294 (1.6%)
NYAP	86 (0.5%)	108 (0.6%)
NYFL	89 (0.5%)	78 (0.4%)
NYRT	504 (2.8%)	454 (2.4%)
NYWN	50 (0.3%)	41 (0.2%)
OHLB	253 (1.4%)	247 (1.3%)
OHLC	145 (0.8%)	206 (1.1%)
OHLP	221 (1.2%)	270 (1.4%)
OHOV	142 (0.8%)	145 (0.8%)
OKOP	249 (1.4%)	239 (1.3%)
ORUO	191 (1.1%)	265 (1.4%)
PADV	992 (5.5%)	975 (5.2%)

*(continued)*

OPO	Pre-Policy	Post-Policy
PATF	357 (2.0%)	442 (2.3%)
PRLL	184 (1.0%)	181 (1.0%)
SCOP	269 (1.5%)	268 (1.4%)
TNDS	491 (2.7%)	560 (3.0%)
TNMS	114 (0.6%)	122 (0.6%)
TXGC	692 (3.9%)	654 (3.5%)
TXSA	302 (1.7%)	339 (1.8%)
TXSB	661 (3.7%)	622 (3.3%)
UTOP	190 (1.1%)	236 (1.3%)
VATB	291 (1.6%)	314 (1.7%)
WALC	445 (2.5%)	452 (2.4%)
WIDN	159 (0.9%)	148 (0.8%)
WIUW	210 (1.2%)	233 (1.2%)
Total	17898 (100.0%)	18834 (100.0%)