

Median MELD at Transplant Around the Donor Hospital Two-Year Monitoring Report

DHHS Contract No. 250-2019-00001C

Date Completed: February 14, 2025

Prepared for:

Liver & Intestinal Transplantation Committee
 Committee Meeting
 Date of Meeting: February 21, 2025

By:

Benjamin Schumacher, PhD, MPH
 UNOS Research Department

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Executive Summary

This report provides a review of the first two years under the Median MELD at Transplant (MMaT) around the donor hospital policy. After implementation of the MMaT around the donor hospital policy:

- The number of waiting list registrations and proportion of registrations by exception type (no exception, HCC exception, non-HCC exception) remained consistent pre- versus post-policy, both overall and when examined by OPTN Region.
- Waiting list removal rates due to death or too sick by exception type remained fairly consistent (slight, statistically insignificant decreases across exception types) pre- versus post-policy, both overall and for most OPTN Regions.
- Transplant rates by exception type increased pre- to post-policy, both overall and for nearly all OPTN Regions.
- The proportion of initial and extension requests that were approved remained constant or had a slight decrease from pre- to post-policy, although the extent of this decrease varied by review board assignment and by OPTN Region.
- The median score adjustment requested for standard initial and extension MELD or PELD exceptions remained the same across policy eras. The interquartile range (difference between the 75th and 25th percentile) of score adjustments requested was similar as well (with an increase in the Initial forms' range). Similar trends were seen by OPTN Region.
- The median allocation MELD or PELD score at transplant increased slightly pre- to post-policy for those transplanted with an exception. The spread of allocation MELD or PELD score at transplant was smaller (i.e. the interquartile range was tighter) post-policy for both HCC and non-HCC exceptions. Similar trends were seen by OPTN Region.
- The median MMaT scores for adult liver-alone transplant recipients who were transplanted with exceptions increased slightly pre- to post-policy. The spread of MMaT scores for adult liver-alone transplant recipients who were transplanted with exceptions was smaller post-policy. Similar trends were seen by OPTN Region.

This report also evaluates the impact of the Ischemic Cholangiopathy and Polycystic Liver Disease (PLD) guidances. Given the smaller number of candidates and transplants with these diagnoses, the findings below should be interpreted cautiously:

- As expected, the median score adjustment requested for exception candidates with ischemic cholangiopathy or polycystic liver disease increased pre- versus post-guidance.
- For exception candidates with ischemic cholangiopathy, the median allocation MELD or PELD score at transplant slightly decreased pre- to post-guidance and the interquartile range also decreased.
- For exception candidates with Polycystic Liver Disease (PLD), the median allocation MELD or PELD score at transplant increased pre- to post-guidance and the interquartile range decreased.

Background/Purpose

The Model for End Stage Liver Disease (MELD) score is used to prioritize liver transplant candidates who are 12 years of age or older, while the Pediatric End Stage Liver Disease (PELD) score prioritizes liver transplant candidates who are less than 12 years old. MELD and PELD are measures of medical urgency that are calculated based on clinical data. In some cases, however, candidates' MELD or PELD scores do not adequately reflect their true medical urgency. In these cases, the median MELD at transplant (MMaT) is used to assign MELD exception scores to liver transplant candidates who are 12 years of age or older; median PELD at transplant (MPaT) is used to assign PELD exception scores to liver transplant candidates who are less than 12 years old.

Historically, MMaT was calculated as the median of the MELD scores at the time of transplant of all recipients at least 12 years old who were transplanted at hospitals within 250 nautical miles of a candidate's transplant hospital in a 365 day cohort (excluding recipients who were transplanted with livers from living donors, donation after circulatory death (DCD) donors, donors from donor hospitals outside 500 nautical miles of the transplant hospital, or who were status 1A or 1B at the time of transplant). As a result, each transplant program had its own MMaT, and allocation scores for exception candidates on the waiting list were known. However, this approach also implied that exception candidates at transplant programs within close geographic proximity could have different exception scores even if their medical urgency was the same. To address this concern, on June 28, 2022, the OPTN implemented the "Calculate Median MELD at Transplant Around the Donor Hospital and Update Sorting Within Liver Allocation" policy. Under this policy, the MMaT calculation is now based on a subset of transplants with a MELD score performed within a specified distance of the donor hospital, rather than the transplant program. As a result, each donor hospital now has an MMaT, and allocation scores for exception candidates on the waiting list are not known until the match is run. Note that this policy did not impact how MPaT values are calculated; MPaT is still calculated as the median of the PELD scores at the time of transplant of all recipients less than 12 years old in the nation in a 365 day cohort (excluding recipients who are transplanted with livers from living donors, donation after circulatory death (DCD) donors, donors from donor hospitals outside 500 nautical miles of the transplant hospital, or who were status 1A or 1B at the time of transplant). For more details on this policy change, please see the MMAT around the donor hospital briefing paper.

The purpose of this report is to assess the impact of the new MMaT around the donor hospital calculation on patient rankings and access to transplant. More specifically, the report aims to determine whether non-exception and exception candidates are ranked more appropriately with each other under the MMaT around the donor hospital calculation compared to the previous MMaT around the transplant center calculation. We also aim to determine whether exception candidates across the country have more equitable access to transplant post-policy compared to pre-policy. Additionally, we include metrics to assess the impact of the Ischemic Cholangiopathy and Polycystic Liver Disease (PLD) National Liver Review Board (NLRB) guidance documents that were implemented on July 26, 2022.

Monitoring Plan

Monitoring of the effect of the MMaT around the donor hospital policy change implemented on June 28, 2022 will be performed at approximately 6 months, 1 year, and 2 years post-implementation. National results will be provided and some analyses will be stratified by various geographic units, specialty board type (i.e., Adult HCC, Adult Other Diagnosis, and Pediatric), age group (i.e., <2, 2-11, 12-17, 18+ years old), and other features as appropriate.

Relevant analyses:

- Waiting list removal rates, defined as removal due to death or too sick to transplant, by exception type (no exception, HCC exception, non-HCC exception)
- Waiting list transplant rates by exception type
- Count and percent of the waiting list by exception type
- Distribution of score adjustment requested for standard MELD or PELD exception requests

- Count and percent of MELD or PELD exception requests approved
- Count and percent of deceased donor transplant recipients by exception type
- Distribution of allocation MELD or PELD score or status at transplant by exception type
- Distribution of transplant recipients by donor age and recipient age
- Other metrics deemed relevant and necessary to the evaluation of the policy by the OPTN Liver and Intestinal Transplantation Committee at time of analysis

This report also includes the following metrics to evaluate the impact of the Ischemic Cholangiopathy and Polycystic Liver Disease (PLD) guidances that were implemented on July 26, 2022:

- Count of exception forms submitted with an ischemic cholangiopathy diagnosis or a PLD diagnosis
- Distribution of score adjustment requested for ischemic cholangiopathy and PLD exception requests
- Count of transplants with an ischemic cholangiopathy or PLD diagnosis
- Distribution of allocation MELD or PELD score at transplant for recipients with an ischemic cholangiopathy or PLD diagnosis

Key results can be found in the main report. Supporting figures and tables can be found in the Appendix.

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. The report also summarizes liver exception requests including liver MELD and PELD exception request forms submitted during the timeframes noted below. Analyses are based on OPTN data as of January 03, 2025 and are subject to change based on future data submission or correction.

Cohorts

This report includes cohorts of liver-alone registrations ever waiting during 06/27/2020 - 06/27/2022 (pre-policy) and 06/28/2022 - 06/27/2024 (post-policy) for waiting list removal due to death or too sick to transplant and transplant rates. Multi-organ listings are excluded.

The report also summarizes all liver exception requests including liver MELD and PELD exception request forms submitted during 06/27/2020 - 06/27/2022 (pre-policy) and 06/28/2022 - 06/27/2024 (post-policy).

Deceased donor, liver-alone transplant cohorts are defined as 06/27/2020 - 06/27/2022 (pre-policy) and 06/28/2022 - 06/27/2024 (post-policy).

For the ischemic cholangiopathy and PLD guidances, the pre- and post-guidance cohorts are defined as (07/26/2020 - 07/25/2022) and (07/26/2022 - 07/25/2024), respectively.

Analyses are based on OPTN data as of January 03, 2025 and are subject to change based on future data submission or correction.

Methods

Counts and percentages were used to summarize categorical variables or characteristics, while density curves and distribution summaries (minimum, maximum, mean, median, percentiles) were provided for continuous characteristics. If statistical tests of comparison were performed, Chi-Square tests were used for categorical comparisons pre- versus post-policy, and either t-tests or Kolmogorov-Smirnov tests were used for continuous variable comparisons pre- versus post-policy, as appropriate for differences in mean values or full distributions.

Removal rates as 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 (expressed per 100 person-years). Dividing by the number of person-years serves to normalize the rates to account for differences in the number of candidates and duration of time waited within each era by different patient characteristics. For each time interval, all waiting time (active and inactive) within the interval analyzed was used for the person-years calculation. 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. Deaths within 30 days of non-transplant-related removal were counted as removals for death or too sick to transplant.

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 (expressed per 100 person-years). 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.

For removal and transplant rates by exception type 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 an HCC diagnosis within that era. 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 submitted form was used. All other candidates' person-years waiting was attributed to the non-exception group. This exception type definition differs from that used in counts of transplants, where 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.

In some cases, removal and transplant rates were further stratified by age. Note that the MPaT was equal to 35 for the majority of the study period examined in this report, but did decrease to 31 during the most recent scheduled update.

Finally, some registrations with exceptions might have been waiting in both the pre- and post-policy periods. In these circumstances, the exception scores were converted to match the new score adjustment requirements after implementation of the policy.

Results

Waiting List

This section of the report examines the composition of the liver-alone waiting list, rates of removal due to death or too sick to transplant, and transplant rates pre- and post-implementation of the MMaT around the donor hospital policy. All analyses in this section are stratified by exception type (no exception, HCC exception, non-HCC exception).

Figure 1 and **Table 1** show the count and percent of liver waiting list registrations at the end of each month by exception type. On average, 11262 registrations were waiting at the end of each month. The majority of registrations had no exception, followed by HCC exceptions and non-HCC exceptions. Counts and percents remained consistent pre- and post-policy. On average, 81.7% of registrations had no exceptions at the end of each month, 15.1% of registrations had HCC exceptions at the end of each month, and 3.2% of registrations had non-HCC exceptions at the end of each month. Similar trends were seen when examined by OPTN Region (**Appendix Figure 1** and **Appendix Table 1**).

Figure 1. Percent of Liver Waiting List Registrations at the End of each Month by Exception Type

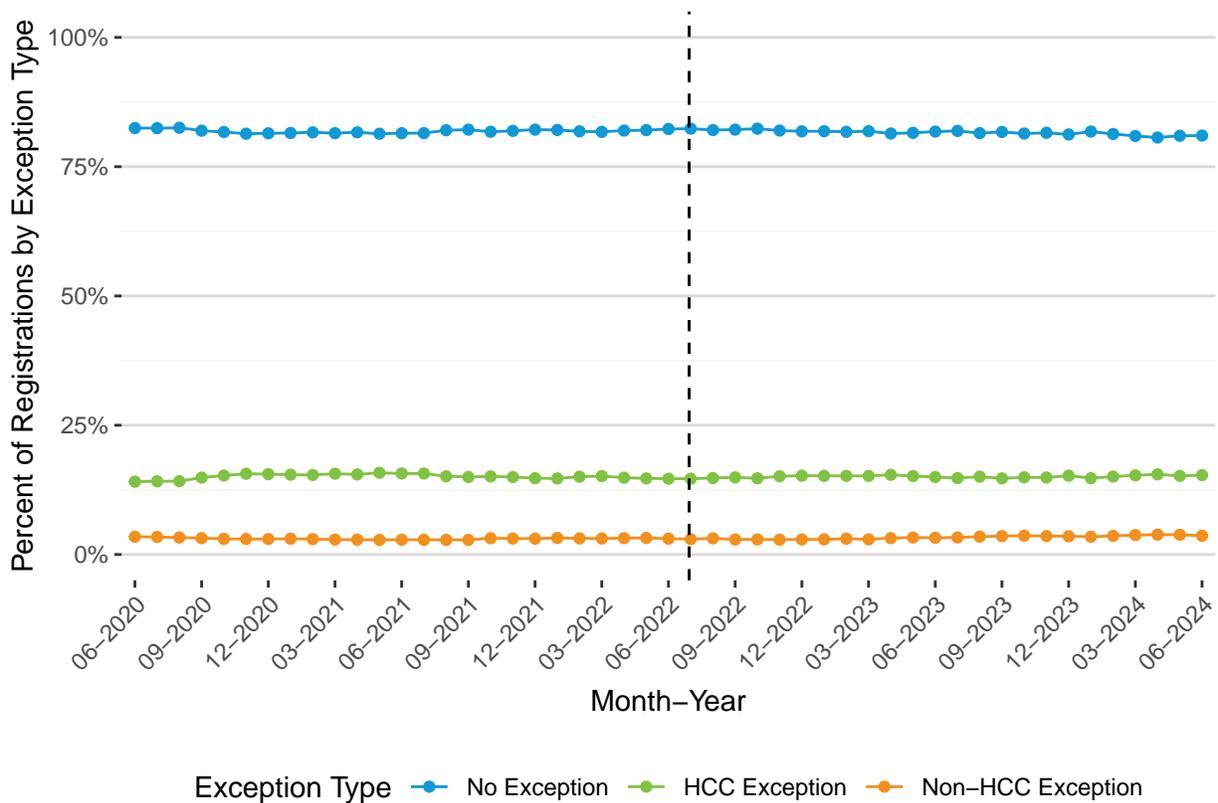


Table 1. Count and Percent of Liver Waiting List Registrations at the End of each Month by Exception Type

| Month-Year | No Exception | | HCC Exception | | Non-HCC Exception | |
|------------|--------------|-------|---------------|-------|-------------------|------|
| | N | % | N | % | N | % |
| 06-2020 | 10397 | 82.47 | 1777 | 14.10 | 433 | 3.43 |
| 07-2020 | 10298 | 82.44 | 1769 | 14.16 | 424 | 3.39 |
| 08-2020 | 10233 | 82.52 | 1759 | 14.19 | 408 | 3.29 |
| 09-2020 | 10132 | 81.96 | 1839 | 14.88 | 391 | 3.16 |
| 10-2020 | 10110 | 81.70 | 1891 | 15.28 | 374 | 3.02 |
| 11-2020 | 9996 | 81.37 | 1919 | 15.62 | 369 | 3.00 |
| 12-2020 | 9965 | 81.45 | 1902 | 15.55 | 367 | 3.00 |
| 01-2021 | 9872 | 81.51 | 1869 | 15.43 | 370 | 3.06 |
| 02-2021 | 9857 | 81.64 | 1857 | 15.38 | 360 | 2.98 |
| 03-2021 | 9798 | 81.48 | 1880 | 15.63 | 347 | 2.89 |
| 04-2021 | 9847 | 81.64 | 1868 | 15.49 | 346 | 2.87 |
| 05-2021 | 9862 | 81.36 | 1916 | 15.81 | 343 | 2.83 |
| 06-2021 | 9837 | 81.47 | 1891 | 15.66 | 346 | 2.87 |
| 07-2021 | 9774 | 81.48 | 1880 | 15.67 | 341 | 2.84 |
| 08-2021 | 9785 | 82.04 | 1804 | 15.13 | 338 | 2.83 |
| 09-2021 | 9843 | 82.16 | 1797 | 15.00 | 340 | 2.84 |
| 10-2021 | 9722 | 81.75 | 1796 | 15.10 | 374 | 3.14 |
| 11-2021 | 9702 | 81.92 | 1775 | 14.99 | 366 | 3.09 |
| 12-2021 | 9694 | 82.17 | 1742 | 14.77 | 362 | 3.07 |
| 01-2022 | 9577 | 82.09 | 1716 | 14.71 | 373 | 3.20 |
| 02-2022 | 9468 | 81.83 | 1741 | 15.05 | 361 | 3.12 |
| 03-2022 | 9415 | 81.73 | 1747 | 15.17 | 357 | 3.10 |
| 04-2022 | 9380 | 81.98 | 1700 | 14.86 | 362 | 3.16 |
| 05-2022 | 9356 | 82.06 | 1679 | 14.73 | 366 | 3.21 |
| 06-2022 | 9457 | 82.28 | 1685 | 14.66 | 352 | 3.06 |
| 07-2022 | 9354 | 82.36 | 1665 | 14.66 | 339 | 2.98 |
| 08-2022 | 9278 | 82.08 | 1672 | 14.79 | 353 | 3.12 |
| 09-2022 | 9307 | 82.17 | 1690 | 14.92 | 330 | 2.91 |
| 10-2022 | 9186 | 82.35 | 1644 | 14.74 | 325 | 2.91 |
| 11-2022 | 9107 | 81.99 | 1681 | 15.13 | 320 | 2.88 |
| 12-2022 | 9032 | 81.83 | 1683 | 15.25 | 322 | 2.92 |
| 01-2023 | 8848 | 81.86 | 1644 | 15.21 | 317 | 2.93 |
| 02-2023 | 8796 | 81.74 | 1637 | 15.21 | 328 | 3.05 |
| 03-2023 | 8735 | 81.87 | 1621 | 15.19 | 314 | 2.94 |

(continued)

| Month-Year | N | % | N | % | N | % |
|------------|------|-------|------|-------|-----|------|
| 04-2023 | 8628 | 81.41 | 1634 | 15.42 | 336 | 3.17 |
| 05-2023 | 8581 | 81.54 | 1597 | 15.17 | 346 | 3.29 |
| 06-2023 | 8523 | 81.79 | 1561 | 14.98 | 337 | 3.23 |
| 07-2023 | 8472 | 81.92 | 1529 | 14.78 | 341 | 3.30 |
| 08-2023 | 8400 | 81.48 | 1552 | 15.05 | 357 | 3.46 |
| 09-2023 | 8376 | 81.72 | 1509 | 14.72 | 365 | 3.56 |
| 10-2023 | 8336 | 81.41 | 1529 | 14.93 | 374 | 3.65 |
| 11-2023 | 8394 | 81.54 | 1533 | 14.89 | 367 | 3.57 |
| 12-2023 | 8271 | 81.23 | 1552 | 15.24 | 359 | 3.53 |
| 01-2024 | 8208 | 81.79 | 1482 | 14.77 | 345 | 3.44 |
| 02-2024 | 8192 | 81.32 | 1519 | 15.08 | 363 | 3.60 |
| 03-2024 | 8089 | 80.93 | 1530 | 15.31 | 376 | 3.76 |
| 04-2024 | 7959 | 80.64 | 1531 | 15.51 | 380 | 3.85 |
| 05-2024 | 7932 | 80.98 | 1489 | 15.20 | 374 | 3.82 |
| 06-2024 | 7826 | 81.01 | 1483 | 15.35 | 351 | 3.63 |

Figure 2 and **Table 2** show the count and percent of liver waiting list registrations at the end of each month by exception type and age (pediatric: <18 years old vs. adult: 18+ years old). In both age groups, the majority of registrations had no exception. Among adult registrations, HCC exceptions made up a larger proportion of registrations compared to non-HCC exceptions. Conversely, among pediatric registrations, non-HCC exceptions were more common, with very few pediatric candidates receiving HCC exceptions. Counts and percents remained fairly consistent pre- and post-policy, although the small sample size among pediatric candidates led to more variability.

Figure 2. Percent of Liver Waiting List Registrations each Month by Exception Type and Age

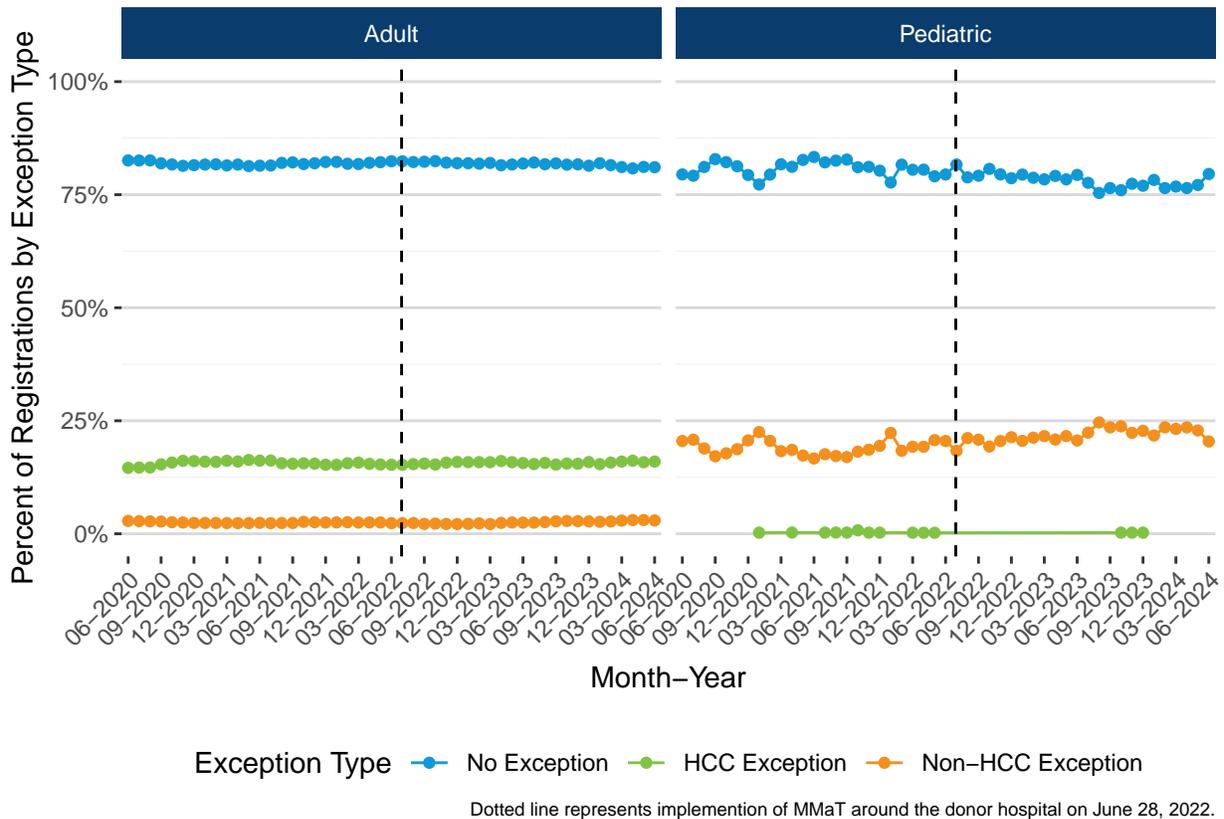


Table 2. Count and Percent of Liver Waiting List Registrations each Month by Exception Type and Age

| Month-Year | Recipient Age | No Exception | | HCC Exception | | Non-HCC Exception | |
|------------|---------------|--------------|-------|---------------|-------|-------------------|-------|
| | | N | % | N | % | N | % |
| 06-2020 | Adult | 10063 | 82.57 | 1777 | 14.58 | 347 | 2.85 |
| | Pediatric | 333 | 79.47 | 0 | 0.00 | 86 | 20.53 |
| 07-2020 | Adult | 9967 | 82.56 | 1769 | 14.65 | 337 | 2.79 |
| | Pediatric | 331 | 79.19 | 0 | 0.00 | 87 | 20.81 |
| 08-2020 | Adult | 9902 | 82.57 | 1759 | 14.67 | 331 | 2.76 |
| | Pediatric | 331 | 81.13 | 0 | 0.00 | 77 | 18.87 |
| 09-2020 | Adult | 9813 | 81.93 | 1839 | 15.35 | 325 | 2.71 |
| | Pediatric | 319 | 82.86 | 0 | 0.00 | 66 | 17.14 |
| 10-2020 | Adult | 9795 | 81.68 | 1891 | 15.77 | 306 | 2.55 |
| | Pediatric | 314 | 82.20 | 0 | 0.00 | 68 | 17.80 |
| 11-2020 | Adult | 9678 | 81.38 | 1919 | 16.14 | 296 | 2.49 |
| | Pediatric | 317 | 81.28 | 0 | 0.00 | 73 | 18.72 |
| 12-2020 | Adult | 9645 | 81.52 | 1902 | 16.08 | 284 | 2.40 |
| | Pediatric | 319 | 79.35 | 0 | 0.00 | 83 | 20.65 |
| 01-2021 | Adult | 9562 | 81.66 | 1868 | 15.95 | 280 | 2.39 |
| | Pediatric | 309 | 77.25 | 1 | 0.25 | 90 | 22.50 |
| 02-2021 | Adult | 9539 | 81.71 | 1857 | 15.91 | 278 | 2.38 |
| | Pediatric | 317 | 79.45 | 0 | 0.00 | 82 | 20.55 |
| 03-2021 | Adult | 9484 | 81.47 | 1880 | 16.15 | 277 | 2.38 |
| | Pediatric | 313 | 81.72 | 0 | 0.00 | 70 | 18.28 |
| 04-2021 | Adult | 9540 | 81.66 | 1867 | 15.98 | 276 | 2.36 |
| | Pediatric | 306 | 81.17 | 1 | 0.27 | 70 | 18.57 |
| 05-2021 | Adult | 9541 | 81.32 | 1916 | 16.33 | 276 | 2.35 |
| | Pediatric | 320 | 82.69 | 0 | 0.00 | 67 | 17.31 |
| 06-2021 | Adult | 9516 | 81.41 | 1891 | 16.18 | 282 | 2.41 |
| | Pediatric | 320 | 83.33 | 0 | 0.00 | 64 | 16.67 |
| 07-2021 | Adult | 9451 | 81.46 | 1879 | 16.20 | 272 | 2.34 |
| | Pediatric | 322 | 82.14 | 1 | 0.26 | 69 | 17.60 |
| 08-2021 | Adult | 9478 | 82.03 | 1803 | 15.60 | 274 | 2.37 |
| | Pediatric | 307 | 82.53 | 1 | 0.27 | 64 | 17.20 |
| 09-2021 | Adult | 9531 | 82.14 | 1796 | 15.48 | 276 | 2.38 |
| | Pediatric | 312 | 82.76 | 1 | 0.27 | 64 | 16.98 |
| 10-2021 | Adult | 9405 | 81.78 | 1793 | 15.59 | 303 | 2.63 |
| | Pediatric | 317 | 81.07 | 3 | 0.77 | 71 | 18.16 |
| | Adult | 9379 | 81.95 | 1774 | 15.50 | 292 | 2.55 |

(continued)

| Month-Year | Recipient Age | N | % | N | % | N | % |
|------------|---------------|------|-------|------|-------|-----|-------|
| 11-2021 | Pediatric | 323 | 81.16 | 1 | 0.25 | 74 | 18.59 |
| | Adult | 9372 | 82.23 | 1741 | 15.28 | 284 | 2.49 |
| 12-2021 | Pediatric | 322 | 80.30 | 1 | 0.25 | 78 | 19.45 |
| | Adult | 9260 | 82.25 | 1716 | 15.24 | 282 | 2.50 |
| 01-2022 | Pediatric | 317 | 77.70 | 0 | 0.00 | 91 | 22.30 |
| | Adult | 9130 | 81.84 | 1741 | 15.61 | 285 | 2.55 |
| 02-2022 | Pediatric | 338 | 81.64 | 0 | 0.00 | 76 | 18.36 |
| | Adult | 9072 | 81.78 | 1746 | 15.74 | 275 | 2.48 |
| 03-2022 | Pediatric | 343 | 80.52 | 1 | 0.23 | 82 | 19.25 |
| | Adult | 9016 | 82.04 | 1699 | 15.46 | 275 | 2.50 |
| 04-2022 | Pediatric | 364 | 80.53 | 1 | 0.22 | 87 | 19.25 |
| | Adult | 9001 | 82.19 | 1678 | 15.32 | 273 | 2.49 |
| 05-2022 | Pediatric | 355 | 79.06 | 1 | 0.22 | 93 | 20.71 |
| | Adult | 9097 | 82.39 | 1685 | 15.26 | 259 | 2.35 |
| 06-2022 | Pediatric | 360 | 79.47 | 0 | 0.00 | 93 | 20.53 |
| | Adult | 8989 | 82.38 | 1665 | 15.26 | 257 | 2.36 |
| 07-2022 | Pediatric | 365 | 81.66 | 0 | 0.00 | 82 | 18.34 |
| | Adult | 8928 | 82.22 | 1672 | 15.40 | 259 | 2.39 |
| 08-2022 | Pediatric | 350 | 78.83 | 0 | 0.00 | 94 | 21.17 |
| | Adult | 8956 | 82.29 | 1690 | 15.53 | 238 | 2.19 |
| 09-2022 | Pediatric | 350 | 79.19 | 0 | 0.00 | 92 | 20.81 |
| | Adult | 8839 | 82.41 | 1644 | 15.33 | 242 | 2.26 |
| 10-2022 | Pediatric | 347 | 80.70 | 0 | 0.00 | 83 | 19.30 |
| | Adult | 8766 | 82.09 | 1681 | 15.74 | 232 | 2.17 |
| 11-2022 | Pediatric | 341 | 79.49 | 0 | 0.00 | 88 | 20.51 |
| | Adult | 8686 | 81.97 | 1683 | 15.88 | 228 | 2.15 |
| 12-2022 | Pediatric | 346 | 78.64 | 0 | 0.00 | 94 | 21.36 |
| | Adult | 8504 | 81.96 | 1644 | 15.84 | 228 | 2.20 |
| 01-2023 | Pediatric | 344 | 79.45 | 0 | 0.00 | 89 | 20.55 |
| | Adult | 8459 | 81.86 | 1637 | 15.84 | 237 | 2.29 |
| 02-2023 | Pediatric | 337 | 78.74 | 0 | 0.00 | 91 | 21.26 |
| | Adult | 8393 | 82.01 | 1621 | 15.84 | 220 | 2.15 |
| 03-2023 | Pediatric | 341 | 78.39 | 0 | 0.00 | 94 | 21.61 |
| | Adult | 8275 | 81.51 | 1634 | 16.10 | 243 | 2.39 |
| 04-2023 | Pediatric | 353 | 79.15 | 0 | 0.00 | 93 | 20.85 |
| | Adult | 8240 | 81.67 | 1597 | 15.83 | 252 | 2.50 |
| 05-2023 | Pediatric | 341 | 78.39 | 0 | 0.00 | 94 | 21.61 |

(continued)

| Month-Year | Recipient Age | N | % | N | % | N | % |
|------------|---------------|------|-------|------|-------|-----|-------|
| 06-2023 | Adult | 8173 | 81.89 | 1561 | 15.64 | 246 | 2.46 |
| | Pediatric | 350 | 79.37 | 0 | 0.00 | 91 | 20.63 |
| 07-2023 | Adult | 8139 | 82.10 | 1529 | 15.42 | 245 | 2.47 |
| | Pediatric | 333 | 77.62 | 0 | 0.00 | 96 | 22.38 |
| 08-2023 | Adult | 8091 | 81.74 | 1552 | 15.68 | 256 | 2.59 |
| | Pediatric | 309 | 75.37 | 0 | 0.00 | 101 | 24.63 |
| 09-2023 | Adult | 8074 | 81.93 | 1509 | 15.31 | 272 | 2.76 |
| | Pediatric | 302 | 76.46 | 0 | 0.00 | 93 | 23.54 |
| 10-2023 | Adult | 8029 | 81.64 | 1528 | 15.54 | 278 | 2.83 |
| | Pediatric | 307 | 75.99 | 1 | 0.25 | 96 | 23.76 |
| 11-2023 | Adult | 8082 | 81.71 | 1532 | 15.49 | 277 | 2.80 |
| | Pediatric | 312 | 77.42 | 1 | 0.25 | 90 | 22.33 |
| 12-2023 | Adult | 7960 | 81.41 | 1551 | 15.86 | 267 | 2.73 |
| | Pediatric | 311 | 76.98 | 1 | 0.25 | 92 | 22.77 |
| 01-2024 | Adult | 7884 | 81.95 | 1482 | 15.40 | 255 | 2.65 |
| | Pediatric | 324 | 78.26 | 0 | 0.00 | 90 | 21.74 |
| 02-2024 | Adult | 7864 | 81.53 | 1519 | 15.75 | 262 | 2.72 |
| | Pediatric | 328 | 76.46 | 0 | 0.00 | 101 | 23.54 |
| 03-2024 | Adult | 7768 | 81.11 | 1530 | 15.98 | 279 | 2.91 |
| | Pediatric | 321 | 76.79 | 0 | 0.00 | 97 | 23.21 |
| 04-2024 | Adult | 7657 | 80.81 | 1531 | 16.16 | 287 | 3.03 |
| | Pediatric | 302 | 76.46 | 0 | 0.00 | 93 | 23.54 |
| 05-2024 | Adult | 7635 | 81.14 | 1489 | 15.82 | 286 | 3.04 |
| | Pediatric | 297 | 77.14 | 0 | 0.00 | 88 | 22.86 |
| 06-2024 | Adult | 7526 | 81.07 | 1483 | 15.98 | 274 | 2.95 |
| | Pediatric | 300 | 79.58 | 0 | 0.00 | 77 | 20.42 |

Figure 3 and **Table 3** show the rate of waiting list removal due to death or too sick to transplant per 100 person-years waiting for liver-alone candidates by exception type and era. In the post-policy era, removal rates due to death or too sick were highest for candidates with no exceptions (Pre: 18.73 [18.06, 19.41] per 100 person-years, Post: 17.88 [17.18, 18.60] per 100 person-years), followed by candidates with non-HCC exceptions (Pre: 18.12 [15.41, 21.16] per 100 person-years, Post: 17.47 [14.76, 20.53] per 100 person-years), and HCC exceptions (Pre: 18.66 [17.41, 19.99] per 100 person-years, Post: 17.79 [16.47, 19.18] per 100 person-years). Within each exception type, removal rates were comparable pre- and post-policy, as evidenced by the overlapping confidence intervals.

Similar results were obtained when removal rates were stratified by exception type and OPTN Region (**Appendix Figure 3** and **Appendix Table 3**), although the number of HCC and non-HCC exceptions was low or zero in some regions. Results were also similar when examined by age group (pediatric: <18 years old versus adult: 18+ years) as well (**Appendix Figure 4** and **Appendix Table 4**). However, care should be taken when interpreting pediatric results, as small numbers can lead to very wide confidence intervals.

Figure 3. Liver-Alone Waiting List Deaths or Removals for Too Sick Per 100 Person-Years Waiting by Exception Type and Era

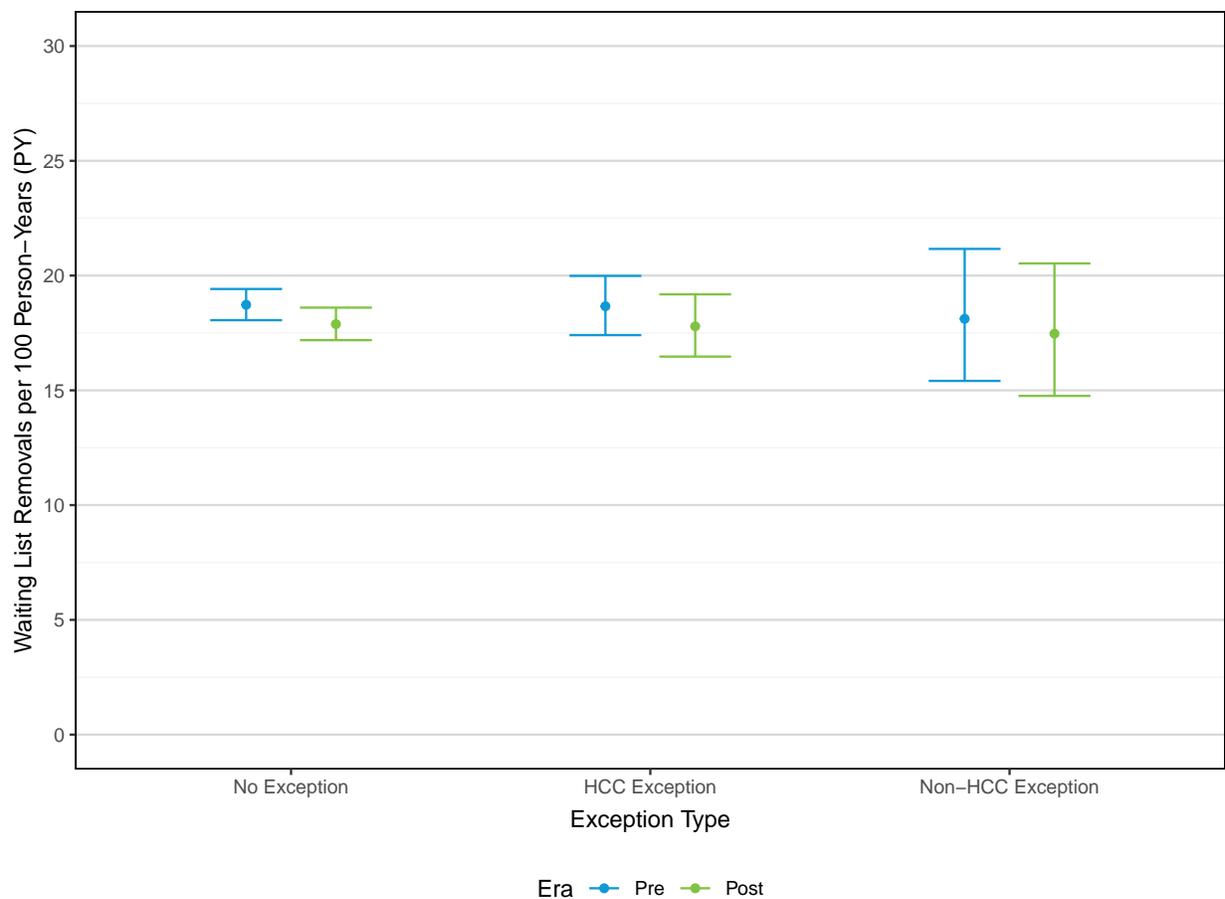


Table 3. Liver-Along Waiting List Deaths or Removals for Too Sick Per 100 Person-Years Waiting by Exception Type and Era

| Era | Exception Type | Ever Waiting | Death/Too Sick Events | Person-Years | Removals per 100 PY | |
|------|-------------------|--------------|-----------------------|--------------|---------------------|----------------|
| | | N | N | PY | Estimate | 95% CI |
| Pre | No Exception | 26550 | 2949 | 15747.7 | 18.73 | (18.06, 19.41) |
| | HCC Exception | 5975 | 818 | 4383.0 | 18.66 | (17.41, 19.99) |
| | Non-HCC Exception | 1713 | 159 | 877.7 | 18.12 | (15.41, 21.16) |
| Post | No Exception | 27402 | 2466 | 13789.3 | 17.88 | (17.18, 18.60) |
| | HCC Exception | 5726 | 674 | 3789.2 | 17.79 | (16.47, 19.18) |
| | Non-HCC Exception | 1892 | 147 | 841.6 | 17.47 | (14.76, 20.53) |

Figure 4 and **Table 4** show liver-alone transplant rates per 100 person-years waiting by exception type and era. Transplant rates were highest for candidates with non-HCC exceptions (Pre: 144.19 [135.51, 153.27] per 100 person-years, Post: 177.81 [168.01, 188.04] per 100 person-years), followed by candidates with no exceptions (Pre: 94.97 [93.25, 96.72] per 100 person-years, Post: 131.53 [129.34, 133.73] per 100 person-years) and those with HCC exceptions (Pre: 76.11 [73.23, 79.07] per 100 person-years, Post: 97.43 [93.87, 101.09] per 100 person-years). Within each exception type, transplant rates increased post-policy compared to pre-policy. These increases were statistically significant. That said, the transplant rates for candidates with no exception and HCC exceptions were still noticeably lower than the transplant rate for candidates with non-HCC exceptions post-policy.

Similar results were obtained when transplant rates were stratified by exception type and OPTN Region (**Appendix Figure 5** and **Appendix Table 5**). Similar results were also obtained when transplant rates were stratified by age (pediatric: <18 years old versus adult: 18+ years old), although the small number of pediatric HCC exception candidates leads to wide confidence intervals (**Appendix Figure 6** and **Appendix Table 6**).

Figure 4. Liver-Alone Transplant Rates Per 100 Active Person-Years Waiting by Exception Type and Era

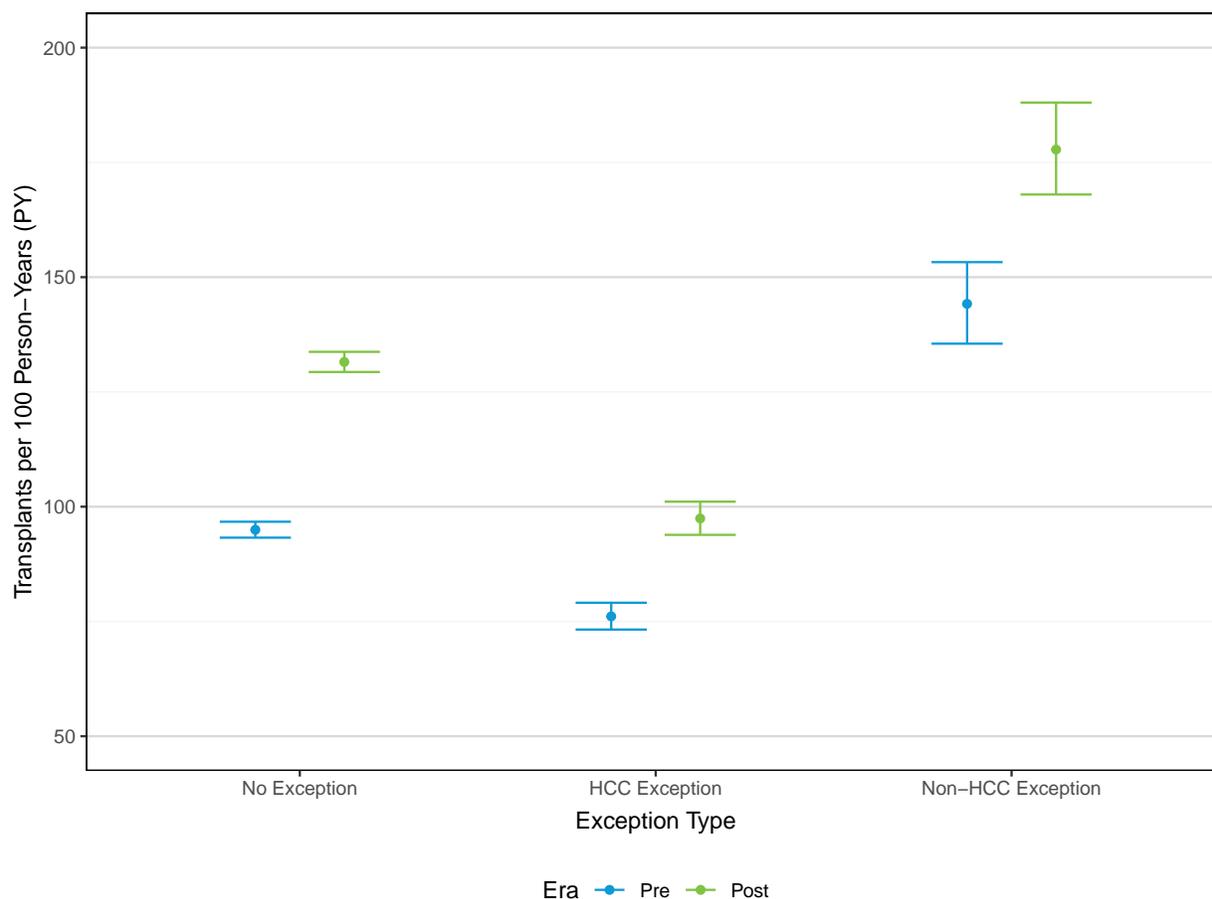


Table 4. Liver-Alone Transplant Rates Per 100 Active Person-Years Waiting by Exception Type and Era

| Era | Exception Type | Ever Waiting | Transplant Events | Active Person-Years | Transplants per 100 Active PY | |
|------|-------------------|--------------|-------------------|---------------------|-------------------------------|------------------|
| | | N | N | PY | Estimate | 95% CI |
| Pre | No Exception | 24668 | 11545 | 12156.2 | 94.97 | (93.25, 96.72) |
| | HCC Exception | 5748 | 2640 | 3468.7 | 76.11 | (73.23, 79.07) |
| | Non-HCC Exception | 1683 | 1029 | 713.7 | 144.19 | (135.51, 153.27) |
| Post | No Exception | 25845 | 13853 | 10532.5 | 131.53 | (129.34, 133.73) |
| | HCC Exception | 5469 | 2819 | 2893.4 | 97.43 | (93.87, 101.09) |
| | Non-HCC Exception | 1856 | 1229 | 691.2 | 177.81 | (168.01, 188.04) |

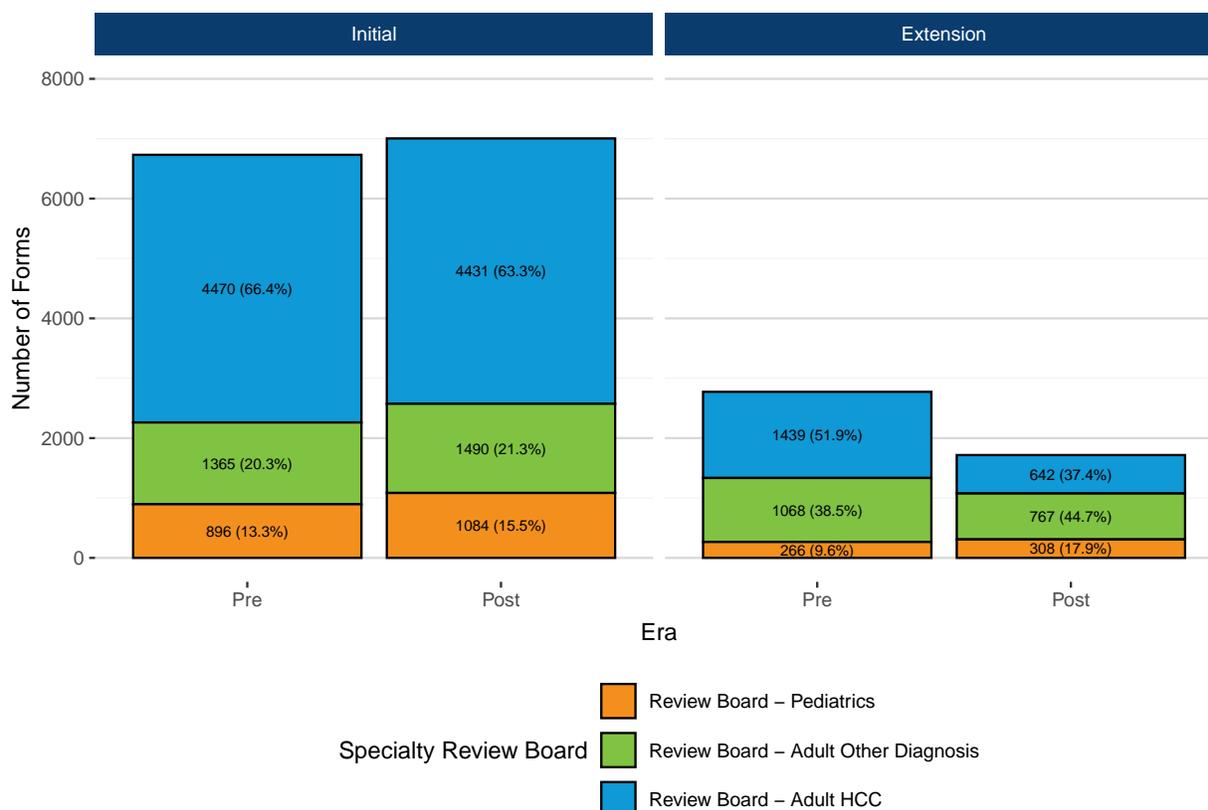
Exception Requests

This section of the report examines liver MELD and PELD exception score request forms. Exception forms submitted for a candidate must be renewed or extended every 90 days in order to keep the exception score. A candidate may have multiple forms submitted during each of the pre- and post-policy eras, including initial, extension, and appeal forms. The following figures include only **initial** and **extension** exception requests to ensure that each form is unique.

Figure 5 and **Table 5** show the number of initial and extension request forms submitted by Specialty Review Board (Adult HCC, Adult Other Diagnosis, and Pediatrics) and era. In both the pre- and post-policy eras, more initial request forms were submitted than extension requests (Pre: 6731 initial requests and 2773 extension requests; Post: 7005 initial requests and 1717 extension requests). The majority of initial request forms were submitted to the Adult HCC Review Board (Pre: 66.4%, Post: 63.3%), followed by Adult Other Diagnosis (Pre: 20.3%, Post: 21.3%) and Pediatrics (Pre: 13.3%, Post: 15.5%).

A higher proportion of extension requests were submitted to Adult HCC (Pre: 51.9% forms, Post: 37.4%) followed by the Adult Other Diagnosis Review Board (Pre: 38.5%, Post: 44.7%), and Pediatrics (Pre: 9.6%, Post: 17.9%).

Figure 5. Initial and Extension Request Forms Submitted by Specialty Review Board and Era



Auto approved forms and forms withdrawn prior to review board assignment are excluded.
 In the Pre era, 3162 initial forms and 9660 extension forms were auto-approved; 70 initial forms and 11 extension forms were withdrawn prior to review board assignment.
 In the Post era, 3058 initial forms and 9085 extension forms were auto-approved; 63 initial forms and 4 extension forms were withdrawn prior to review board assignment.

Table 5. Initial and Extension Request Forms Submitted by Specialty Review Board and Era

| Application Type | Specialty Review Board | Pre-Policy | | Post-Policy | |
|------------------|--------------------------------------|------------|-------|-------------|-------|
| | | N | % | N | % |
| Extension | Review Board - Adult HCC | 1439 | 51.9% | 642 | 37.4% |
| | Review Board - Adult Other Diagnosis | 1068 | 38.5% | 767 | 44.7% |
| | Review Board - Pediatrics | 266 | 9.6% | 308 | 17.9% |
| Initial | Review Board - Adult HCC | 4470 | 66.4% | 4431 | 63.3% |
| | Review Board - Adult Other Diagnosis | 1365 | 20.3% | 1490 | 21.3% |
| | Review Board - Pediatrics | 896 | 13.3% | 1084 | 15.5% |

Auto approved forms and forms withdrawn prior to review board assignment are excluded.

In the Pre era, 3162 initial forms and 9660 extension forms were auto-approved;

70 initial forms and 11 extension forms were withdrawn prior to review board assignment.

In the Post era, 3058 initial forms and 9085 extension forms were auto-approved;

63 initial forms and 4 extension forms were withdrawn prior to review board assignment.

Figure 6 and **Table 6** show the number of initial and extension request forms submitted by diagnosis and era. In both the pre- and post-policy eras, the majority of initial and extension requests were submitted for Hepatocellular carcinoma (HCC) followed by “Other Specify”.

Figure 6. Initial and Extension Request Forms Submitted by Diagnosis and Era

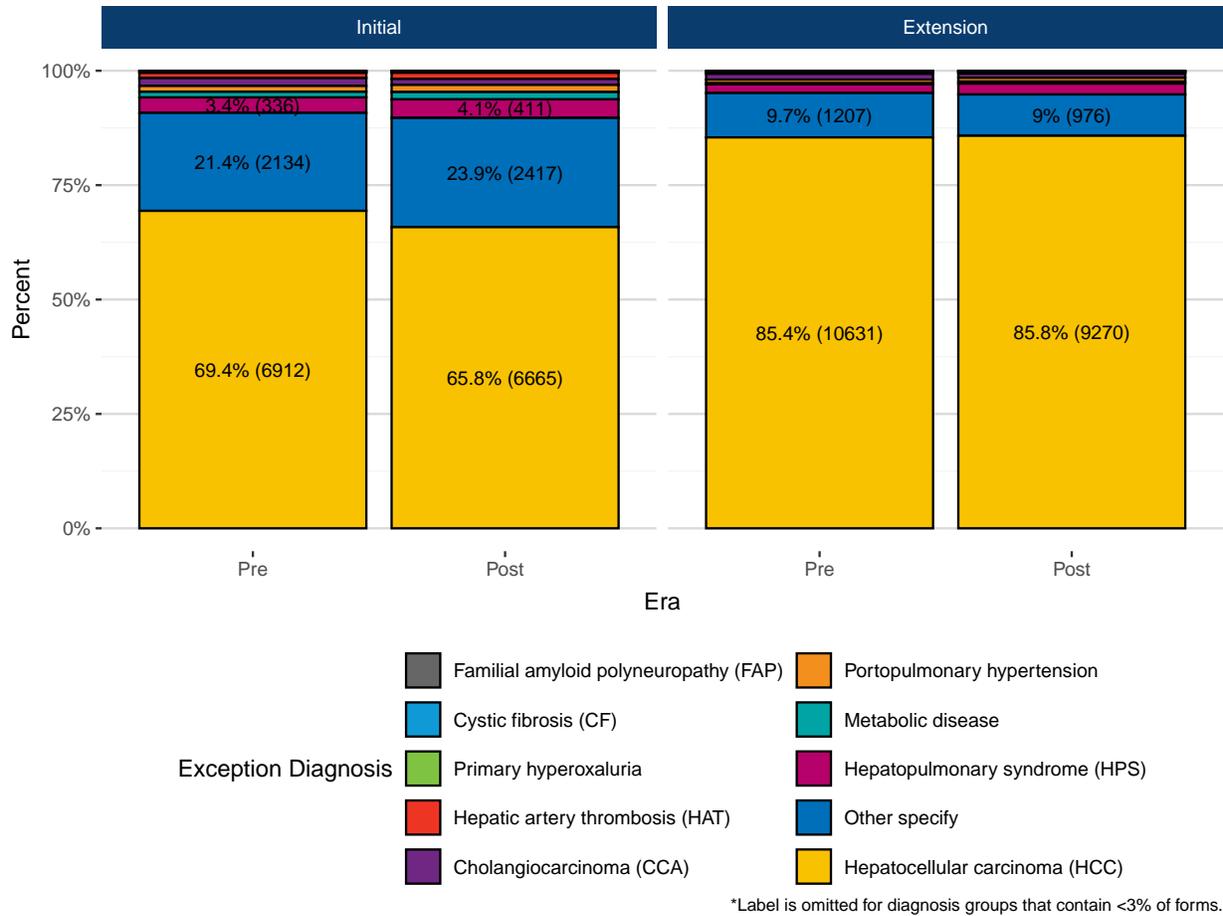


Table 6. Initial and Extension Request Forms Submitted by Diagnosis and Era

| Exception Diagnosis | Application Type | Pre-Policy | | Post-Policy | |
|---------------------------------------|------------------|------------|-------|-------------|-------|
| | | N | % | N | % |
| Familial amyloid polyneuropathy (FAP) | Initial | 7 | 0.1% | 9 | 0.1% |
| | Extension | 19 | 0.2% | 16 | 0.1% |
| Cystic fibrosis (CF) | Initial | 18 | 0.2% | 17 | 0.2% |
| | Extension | 20 | 0.2% | 2 | 0% |
| Primary hyperoxaluria | Initial | 22 | 0.2% | 19 | 0.2% |
| | Extension | 9 | 0.1% | 10 | 0.1% |
| Hepatic artery thrombosis (HAT) | Initial | 113 | 1.1% | 136 | 1.3% |
| | Extension | 37 | 0.3% | 42 | 0.4% |
| Cholangiocarcinoma (CCA) | Initial | 171 | 1.7% | 132 | 1.3% |
| | Extension | 157 | 1.3% | 97 | 0.9% |
| Portopulmonary hypertension | Initial | 127 | 1.3% | 158 | 1.6% |
| | Extension | 97 | 0.8% | 88 | 0.8% |
| Metabolic disease | Initial | 123 | 1.2% | 162 | 1.6% |
| | Extension | 31 | 0.2% | 50 | 0.5% |
| Hepatopulmonary syndrome (HPS) | Initial | 336 | 3.4% | 411 | 4.1% |
| | Extension | 236 | 1.9% | 255 | 2.4% |
| Other specify | Initial | 2134 | 21.4% | 2417 | 23.9% |
| | Extension | 1207 | 9.7% | 976 | 9% |
| Hepatocellular carcinoma (HCC) | Initial | 6912 | 69.4% | 6665 | 65.8% |
| | Extension | 10631 | 85.4% | 9270 | 85.8% |

Figure 7 and **Table 7** show the number of initial and extension request forms submitted by OPTN Region and era. In both the pre- and post-policy eras, Region 5 submitted the highest proportion of initial and extension requests, while Region 6 submitted the lowest proportion of initial and extension requests.

Figure 7. Initial and Extension Request Forms Submitted by OPTN Region and Era

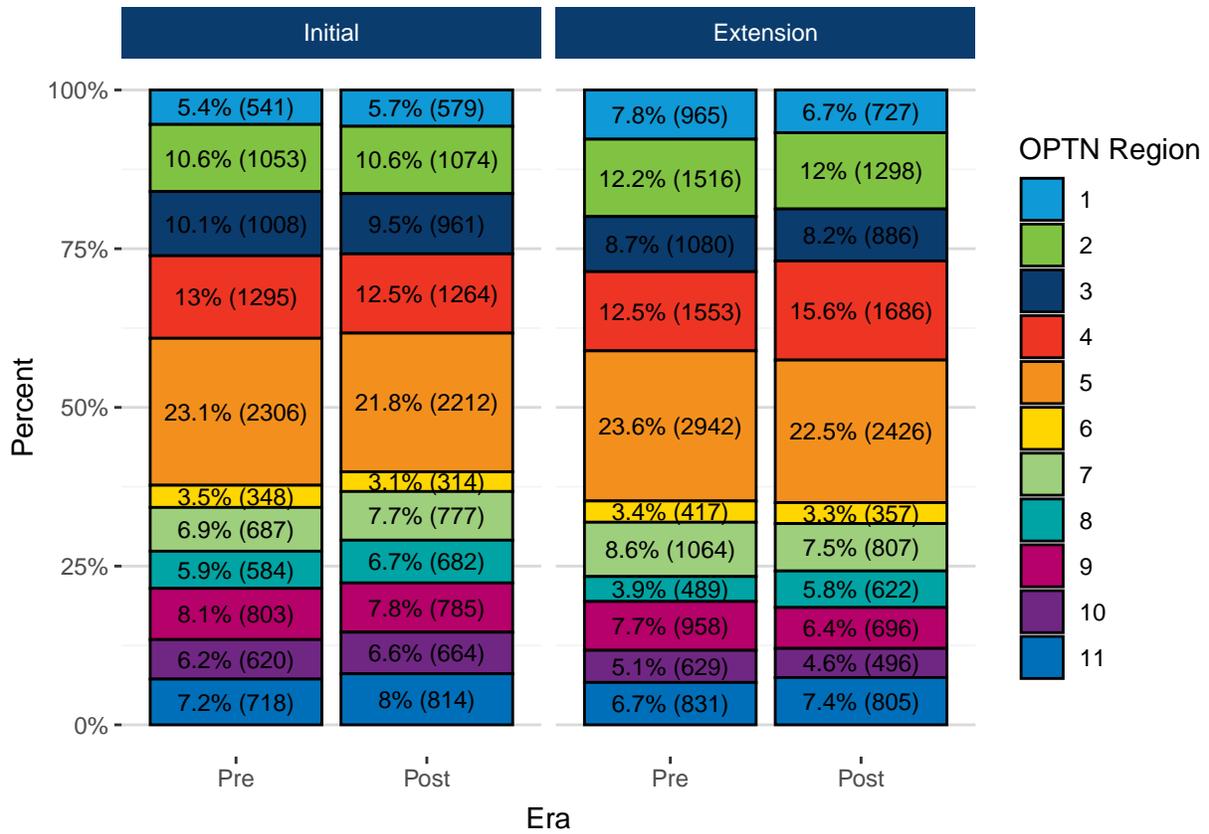


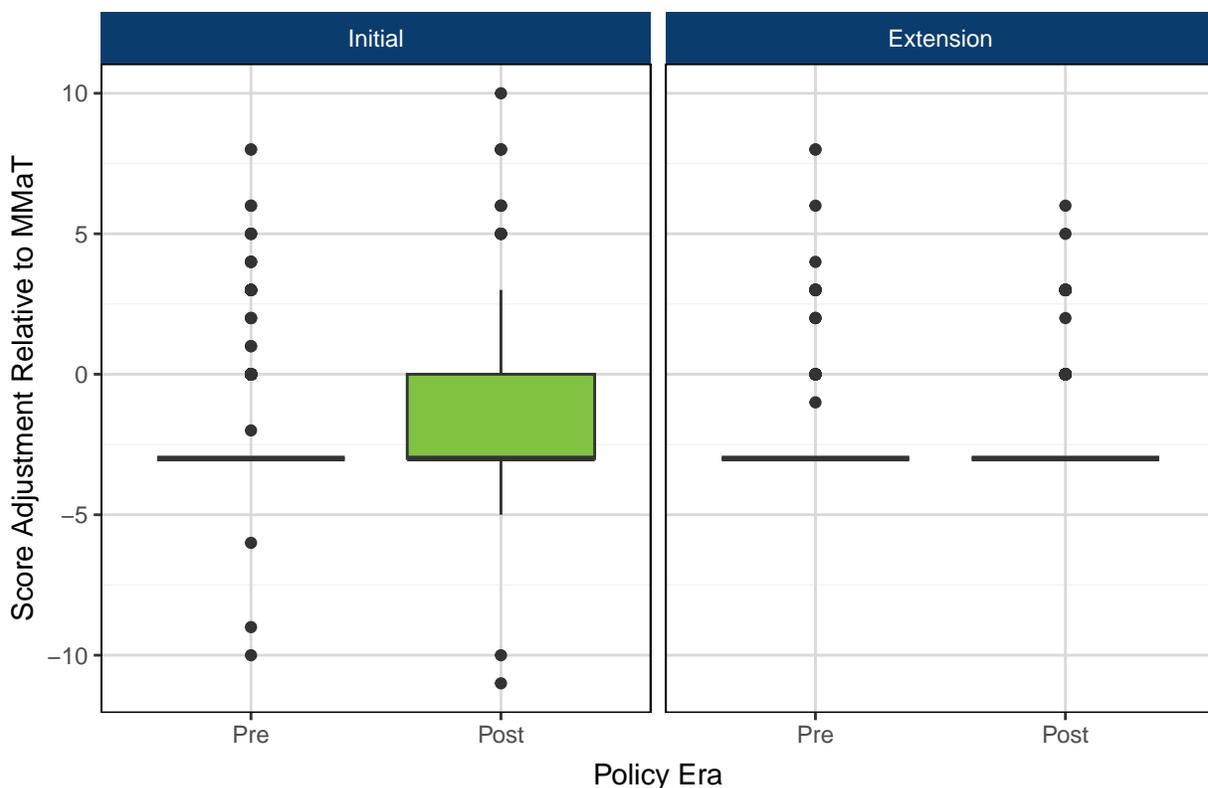
Table 7. Initial and Extension Request Forms Submitted by OPTN Region and Era

| OPTN Region | Application Type | Pre-Policy | | Post-Policy | |
|-------------|------------------|------------|-------|-------------|-------|
| | | N | % | N | % |
| 1 | Initial | 541 | 5.4% | 579 | 5.7% |
| | Extension | 965 | 7.8% | 727 | 6.7% |
| 2 | Initial | 1053 | 10.6% | 1074 | 10.6% |
| | Extension | 1516 | 12.2% | 1298 | 12% |
| 3 | Initial | 1008 | 10.1% | 961 | 9.5% |
| | Extension | 1080 | 8.7% | 886 | 8.2% |
| 4 | Initial | 1295 | 13% | 1264 | 12.5% |
| | Extension | 1553 | 12.5% | 1686 | 15.6% |
| 5 | Initial | 2306 | 23.1% | 2212 | 21.8% |
| | Extension | 2942 | 23.6% | 2426 | 22.5% |
| 6 | Initial | 348 | 3.5% | 314 | 3.1% |
| | Extension | 417 | 3.4% | 357 | 3.3% |
| 7 | Initial | 687 | 6.9% | 777 | 7.7% |
| | Extension | 1064 | 8.6% | 807 | 7.5% |
| 8 | Initial | 584 | 5.9% | 682 | 6.7% |
| | Extension | 489 | 3.9% | 622 | 5.8% |
| 9 | Initial | 803 | 8.1% | 785 | 7.8% |
| | Extension | 958 | 7.7% | 696 | 6.4% |
| 10 | Initial | 620 | 6.2% | 664 | 6.6% |
| | Extension | 629 | 5.1% | 496 | 4.6% |
| 11 | Initial | 718 | 7.2% | 814 | 8% |
| | Extension | 831 | 6.7% | 805 | 7.4% |

Figure 8 and **Table 8** show the distribution of score adjustment requested for standard initial and extension MELD or PELD exception requests by era. The median score adjustment requested for initial MELD or PELD exceptions remained the same before and after policy implementation (Pre: -3, Post: -3). The interquartile range, which captures the middle 50% of score adjustments requested, increased from pre- to post-policy, (i.e., it ranged from -3 to -3 pre-policy and from -3 to 0 post-policy for initial requests). For extension requests, the median score adjustment requested pre-policy (-3) was the same as the median score adjustment requested post-policy (-3). The interquartile range remained the same as well (Pre: -3 to -3, Post: -3 to -3).

When examined by OPTN Region, the median score adjustment requested for standard initial MELD or PELD exceptions decreased pre- to post-policy for OPTN Region 2, but remained about the same across policy eras for all other OPTN Regions (**Appendix Figure 7**). The variability in initial score adjustment requests may be due to small sample size in some OPTN Regions (**Appendix Table 7**). The distribution of score adjustment requested for standard extension MELD or PELD exceptions remained similar across all OPTN Regions pre- to post-policy (**Appendix Figure 8**).

Figure 8. Distribution of Score Adjustment Requested for Standard Initial and Extension MELD or PELD Exception Requests by Era



Initial and first extension HCC requests were excluded, since the policy-assigned score in these cases equals candidates' calculated MELD. In the Pre era, 1694 initial HCC requests and 699 first extension HCC requests were excluded from the plot. In the Post era, 1830 initial HCC requests and 548 first extension HCC requests were excluded from the plot.

Table 8. Distribution of Score Adjustment Requested for Standard Initial and Extension MELD or PELD Exception Requests by Era

| Application Type | Era | Minimum | 25th Percentile | Median | 75th Percentile | Maximum | Interquartile Range | Total Number of Forms |
|------------------|------|---------|-----------------|--------|-----------------|---------|---------------------|-----------------------|
| Initial | Pre | -10 | -3 | -3 | -3 | 8 | 0 | 733 |
| | Post | -11 | -3 | -3 | 0 | 10 | 3 | 931 |
| Extension | Pre | -3 | -3 | -3 | -3 | 8 | 0 | 6216 |
| | Post | -3 | -3 | -3 | -3 | 6 | 0 | 6020 |

Initial and first extension HCC requests were excluded, since the policy-assigned score in these cases equals candidates' calculated MELD

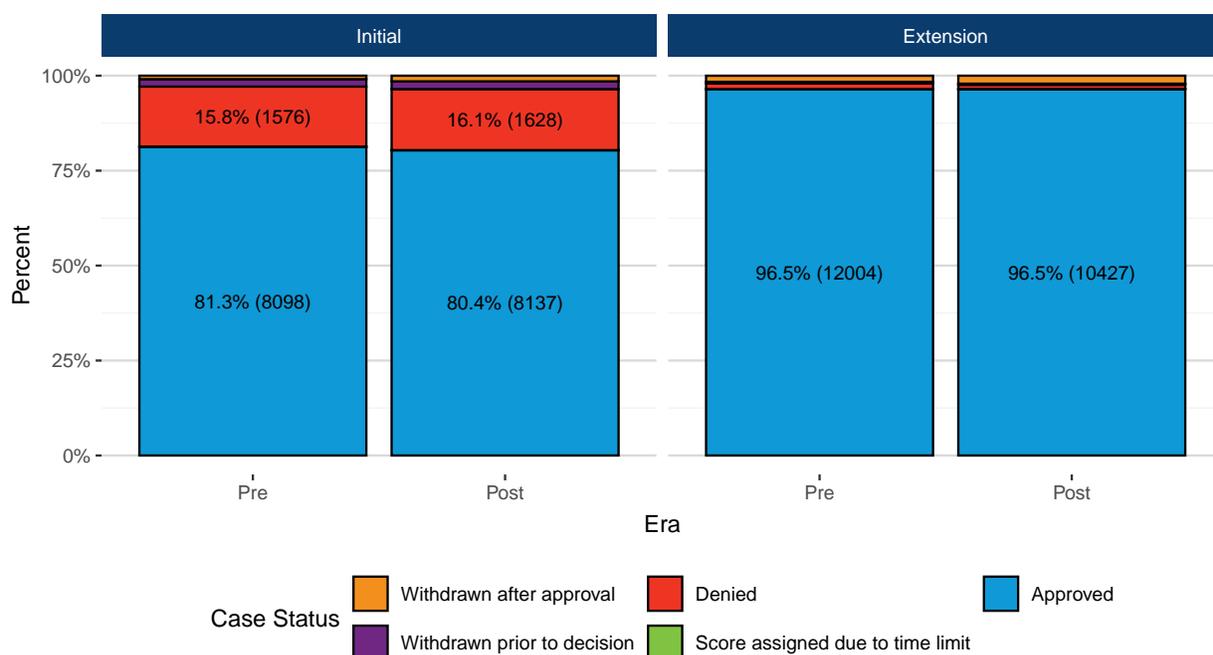
In the Pre era, 1694 initial HCC requests and 699 first extension HCC requests were excluded from the plot;

in the Post era, 1830 initial HCC requests and 548 first extension HCC requests were excluded from the plot.

Figure 9 and **Table 9** show the percentage of initial and extension request forms submitted by case outcome (approved, score assigned due to time limit, denied, withdrawn prior to decision, or withdrawn after approval) and era. The proportion of initial requests that were approved decreased slightly from 81.3% pre-policy to 80.4% post-policy, while the proportion of initial requests that were denied increased from 15.8% pre-policy to 16.1% post-policy. For extension requests, the majority of requests were approved and this percentage remained the same pre- and post-policy (96.5%). The proportion of extension requests that were denied also decreased from 1.5% pre-policy to 1.1% post-policy. For both initial and extension requests, the proportion of requests that were withdrawn after approval increased in the post-policy era compared to the pre-policy era, although withdrawals made up a small proportion of the overall number of forms submitted.

Similar results were obtained when examined by OPTN Region (**Appendix Figure 11**, **Appendix Figure 12**, and **Appendix Table 9**), with 6 regions experiencing a decrease in the proportion of approved initial requests post-policy compared to pre-policy and 3 regions experiencing a decrease in the proportion of approved extension requests post-policy compared to pre-policy.

Figure 9. Initial and Extension Request Forms Submitted by Case Outcome and Era



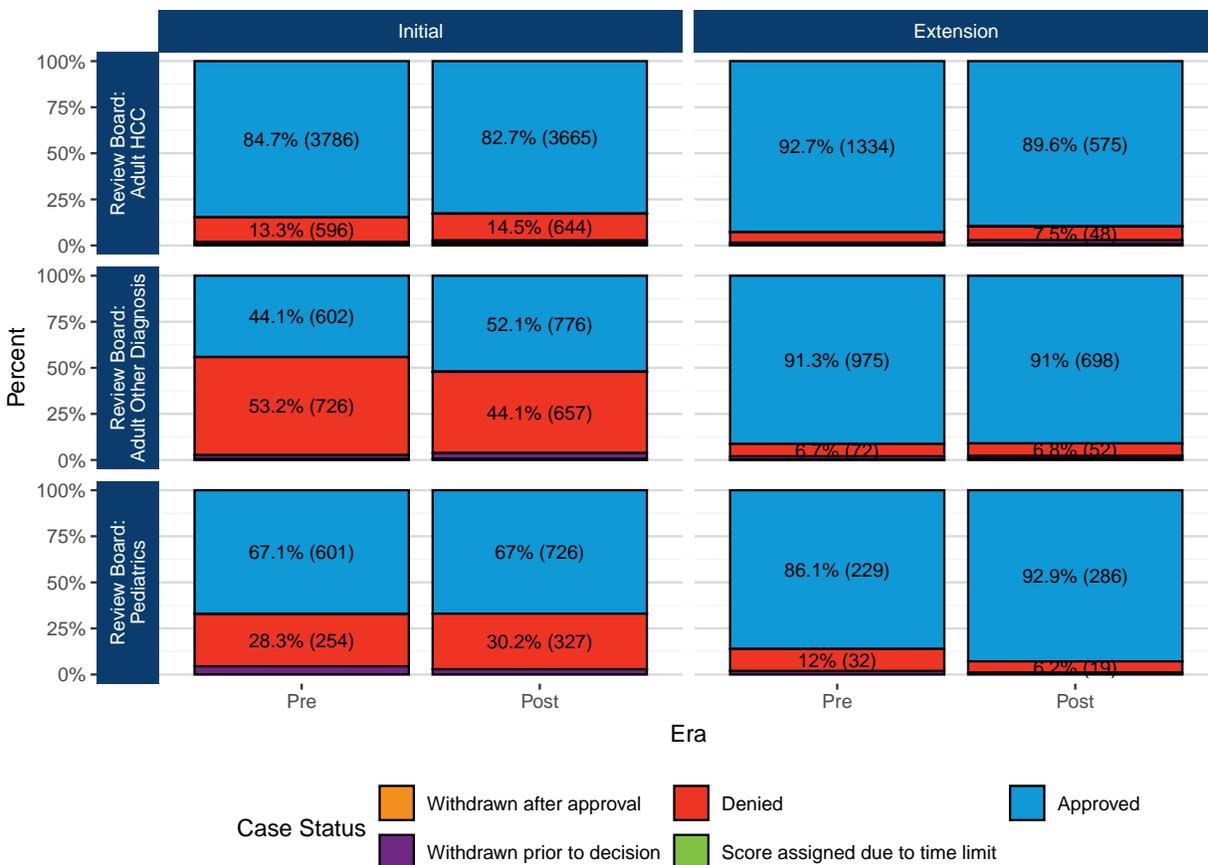
*Label is omitted for outcome categories containing <3% of forms.

Table 9. Initial and Extension Request Forms Submitted by Case Outcome and Era

| Case Outcome | Application Type | Pre-Policy | | Post-Policy | |
|----------------------------------|------------------|------------|-------|-------------|-------|
| | | N | % | N | % |
| Approved | Initial | 8098 | 81.3% | 8137 | 80.4% |
| | Extension | 12004 | 96.5% | 10427 | 96.5% |
| Score assigned due to time limit | Initial | 4 | 0% | 4 | 0% |
| | Extension | 1 | 0% | 1 | 0% |
| Denied | Initial | 1576 | 15.8% | 1628 | 16.1% |
| | Extension | 186 | 1.5% | 119 | 1.1% |
| Withdrawn prior to decision | Initial | 194 | 1.9% | 207 | 2% |
| | Extension | 53 | 0.4% | 33 | 0.3% |
| Withdrawn after approval | Initial | 91 | 0.9% | 150 | 1.5% |
| | Extension | 200 | 1.6% | 226 | 2.1% |

Figure 10 and **Table 10** show the proportion of initial and extension request forms submitted by Specialty Review Board, case outcome, and era. The proportion of initial exception requests that were approved remained stable post-policy compared to pre-policy for the Pediatrics Review Board (Pre: 67.1%, Post: 67%), but increased for the Adult Other Diagnosis Review Board (Pre: 44.1%, Post: 52.1%) and slightly decreased for the Adult HCC Review Board (Pre: 84.7%, Post: 82.7%). The proportion of extension requests that were approved decreased post-policy compared to pre-policy for the Adult HCC Review Board (Pre: 92.7%, Post: 89.6%), remained constant for the Adult Other Diagnosis Review Board (Pre: 91.3%, Post: 91%), but increased for the Pediatrics Review Board (Pre: 86.1%, Post: 92.9%).

Figure 10. Initial and Extension Request Forms Submitted by Specialty Review Board, Case Outcome, and Era



*Label is omitted for outcome categories containing <6% of forms. Auto approved forms and forms withdrawn prior to review board assignment are excluded.

Table 10. Initial and Extension Request Forms Submitted by Specialty Review Board, Case Outcome, and Era

| Specialty Review Board | Application Type | Case Outcome | Pre-Policy | | Post-Policy | |
|--------------------------------------|---------------------------|----------------------------------|------------|-------|-------------|-------|
| | | | N | % | N | % |
| Review Board - Adult HCC | Initial | Approved | 3786 | 84.7% | 3665 | 82.7% |
| | Extension | Approved | 1334 | 92.7% | 575 | 89.6% |
| | Initial | Score assigned due to time limit | 2 | 0% | 3 | 0.1% |
| | Extension | Score assigned due to time limit | 1 | 0.1% | 1 | 0.2% |
| | Initial | Denied | 596 | 13.3% | 644 | 14.5% |
| | Extension | Denied | 82 | 5.7% | 48 | 7.5% |
| | Initial | Withdrawn prior to decision | 55 | 1.2% | 66 | 1.5% |
| | Extension | Withdrawn prior to decision | 18 | 1.3% | 14 | 2.2% |
| | Initial | Withdrawn after approval | 31 | 0.7% | 53 | 1.2% |
| | Extension | Withdrawn after approval | 4 | 0.3% | 4 | 0.6% |
| Review Board - Adult Other Diagnosis | Initial | Approved | 602 | 44.1% | 776 | 52.1% |
| | Extension | Approved | 975 | 91.3% | 698 | 91% |
| | Initial | Score assigned due to time limit | 1 | 0.1% | 1 | 0.1% |
| | | Denied | 726 | 53.2% | 657 | 44.1% |
| | Extension | Denied | 72 | 6.7% | 52 | 6.8% |
| | Initial | Withdrawn prior to decision | 29 | 2.1% | 47 | 3.2% |
| | Extension | Withdrawn prior to decision | 19 | 1.8% | 12 | 1.6% |
| | Initial | Withdrawn after approval | 7 | 0.5% | 9 | 0.6% |
| | Extension | Withdrawn after approval | 2 | 0.2% | 5 | 0.7% |
| | Review Board - Pediatrics | Initial | Approved | 601 | 67.1% | 726 |
| Extension | | Approved | 229 | 86.1% | 286 | 92.9% |
| Initial | | Score assigned due to time limit | 1 | 0.1% | 0 | 0.0% |
| | | Denied | 254 | 28.3% | 327 | 30.2% |
| Extension | | Denied | 32 | 12% | 19 | 6.2% |
| Initial | | Withdrawn prior to decision | 40 | 4.5% | 31 | 2.9% |
| Extension | | Withdrawn prior to decision | 5 | 1.9% | 3 | 1% |

Auto approved forms and forms withdrawn prior to review board assignment are excluded.

Transplants

This section of the report examines liver-alone deceased donor transplant recipients pre- and post-policy.

Figure 11 and **Table 11** show the count and percent of deceased donor liver-alone transplant recipients by exception type (no exception, HCC exception, non-HCC exception) and era. The number of deceased donor liver-alone transplants increased from 15517 transplants during the pre-policy era to 18187 transplants in the post-policy era. In both policy eras, the majority of transplant recipients had no exceptions, followed by HCC exceptions and non-HCC exceptions. The proportion of transplant recipients with no exceptions increased from 82.4% pre-policy to 83.2% post-policy. Conversely, the proportion of transplant recipients with HCC exceptions decreased slightly from pre- to post-policy (Pre: 12.1%, Post: 11.2%), and the proportion of transplant recipients with non-HCC exceptions remained constant (Pre: 5.5%, Post: 5.6%).

Figure 11. Count and Percent of Deceased Donor Liver-Alone Transplant Recipients by Exception Type and Era

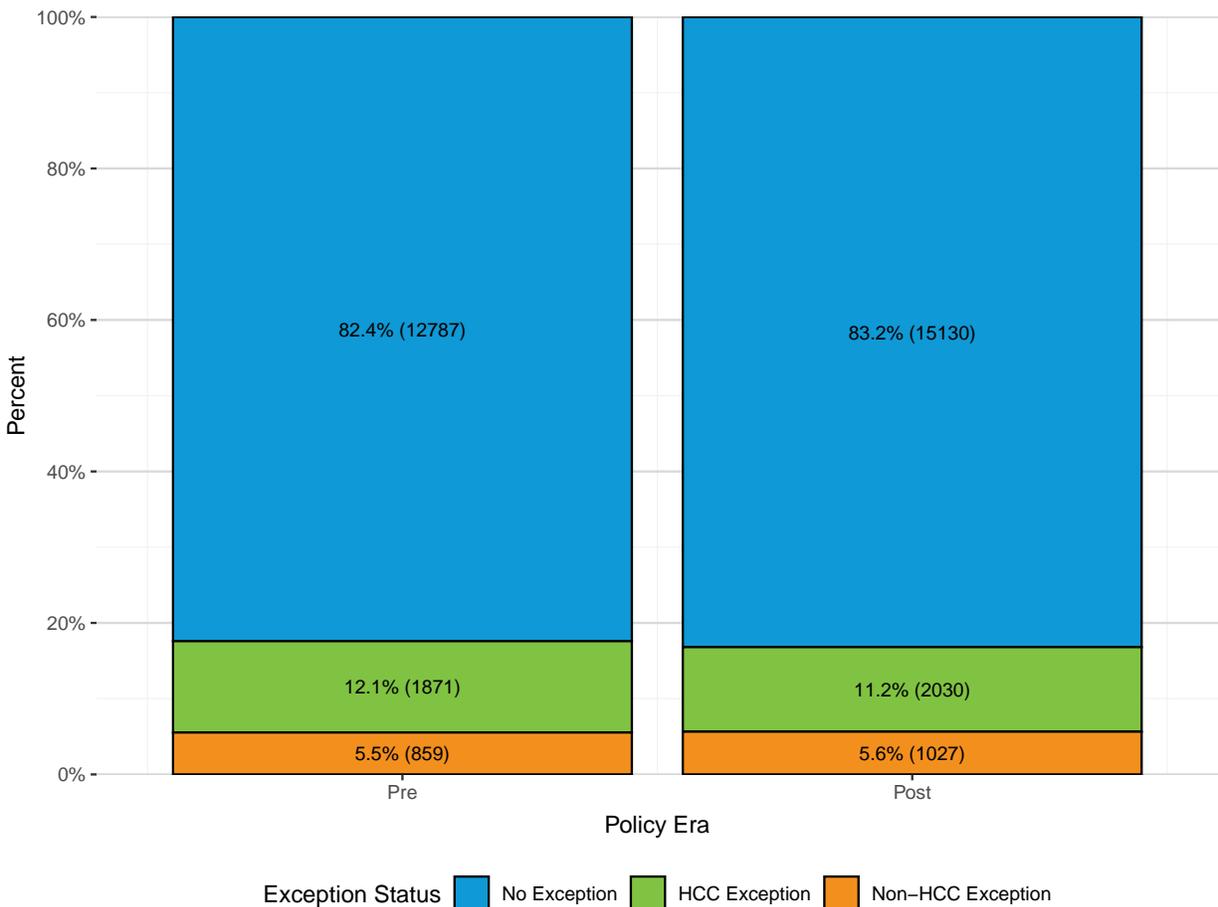
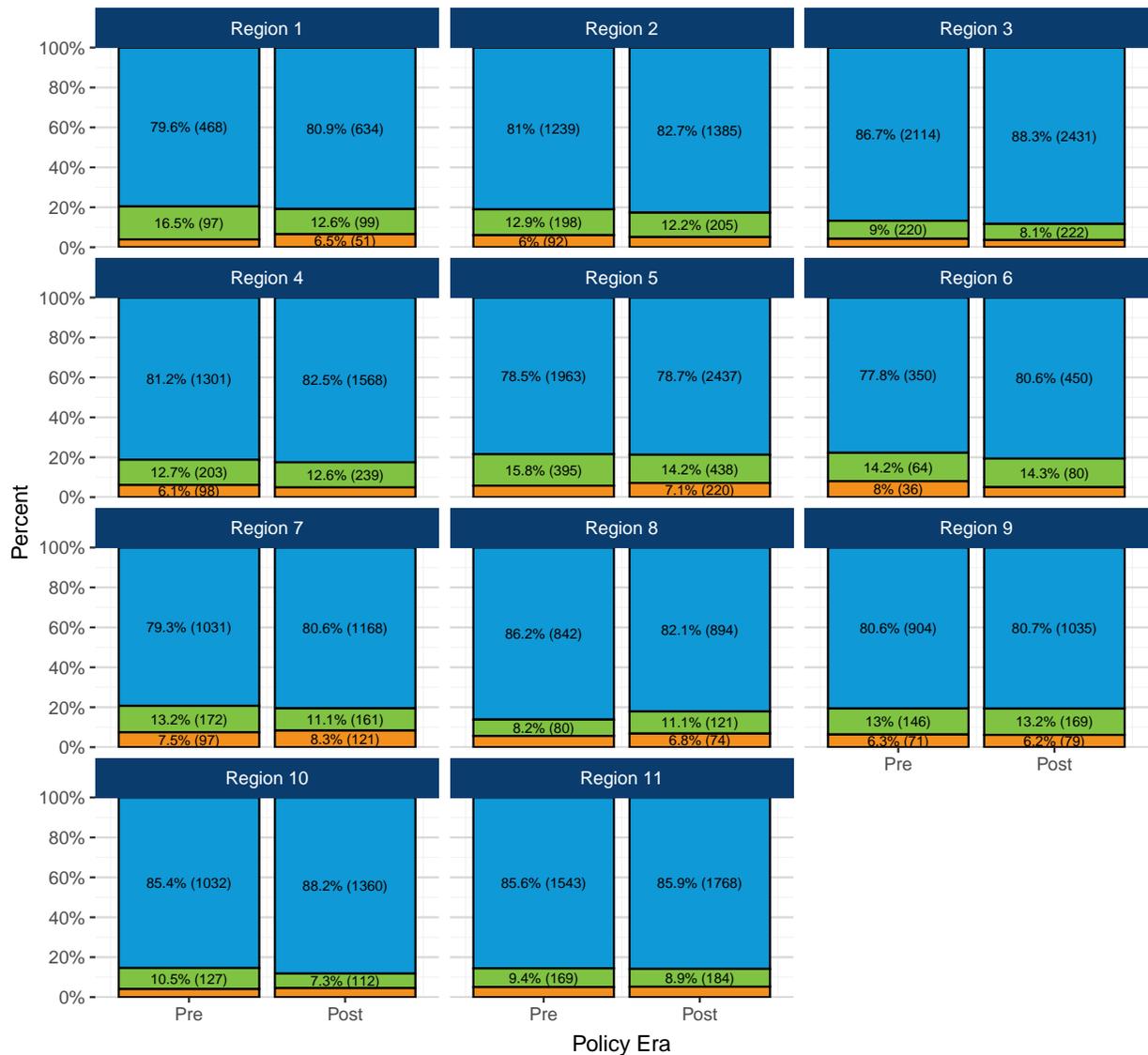


Table 11. Count and Percent of Deceased Donor Liver-Alone Transplant Recipients by Exception Type and Era

| Exception Type | Pre-Policy | | Post-Policy | |
|-------------------|------------|-------|-------------|-------|
| | N | % | N | % |
| No Exception | 12787 | 82.4% | 15130 | 83.2% |
| HCC Exception | 1871 | 12.1% | 2030 | 11.2% |
| Non-HCC Exception | 859 | 5.5% | 1027 | 5.6% |

When deceased donor liver-alone transplant recipients were examined by OPTN Region, most regions experienced increases in the proportion of transplant recipients with no exceptions and decreases in the proportion of transplant recipients with HCC exceptions (Figure 12 and Table 12). More variability was seen among regions for non-HCC exceptions, with 5 regions experiencing a decrease in the proportion of deceased donor liver-alone transplant recipients with non-HCC exceptions and 6 regions experiencing an increase in the proportion of deceased donor liver-alone transplant recipients with non-HCC exceptions.

Figure 12. Count and Percent of Deceased Donor Liver-Alone Transplant Recipients by Exception Type, OPTN Region, and Era



Exception Status ■ No Exception ■ HCC Exception ■ Non-HCC Exception

*Label is omitted for categories containing <6% of forms.

Table 12. Count and Percent of Deceased Donor Liver-Alone Transplant Recipients by Exception Type, OPTN Region, and Era

| Region | Exception Type | Pre-Policy | | Post-Policy | |
|--------|-------------------|------------|-------|-------------|-------|
| | | N | % | N | % |
| 1 | No Exception | 468 | 79.6% | 634 | 80.9% |
| | HCC Exception | 97 | 16.5% | 99 | 12.6% |
| | Non-HCC Exception | 23 | 3.9% | 51 | 6.5% |
| 2 | No Exception | 1239 | 81% | 1385 | 82.7% |
| | HCC Exception | 198 | 12.9% | 205 | 12.2% |
| | Non-HCC Exception | 92 | 6% | 85 | 5.1% |
| 3 | No Exception | 2114 | 86.7% | 2431 | 88.3% |
| | HCC Exception | 220 | 9% | 222 | 8.1% |
| | Non-HCC Exception | 103 | 4.2% | 99 | 3.6% |
| 4 | No Exception | 1301 | 81.2% | 1568 | 82.5% |
| | HCC Exception | 203 | 12.7% | 239 | 12.6% |
| | Non-HCC Exception | 98 | 6.1% | 93 | 4.9% |
| 5 | No Exception | 1963 | 78.5% | 2437 | 78.7% |
| | HCC Exception | 395 | 15.8% | 438 | 14.2% |
| | Non-HCC Exception | 144 | 5.8% | 220 | 7.1% |
| 6 | No Exception | 350 | 77.8% | 450 | 80.6% |
| | HCC Exception | 64 | 14.2% | 80 | 14.3% |
| | Non-HCC Exception | 36 | 8% | 28 | 5% |
| 7 | No Exception | 1031 | 79.3% | 1168 | 80.6% |
| | HCC Exception | 172 | 13.2% | 161 | 11.1% |
| | Non-HCC Exception | 97 | 7.5% | 121 | 8.3% |
| 8 | No Exception | 842 | 86.2% | 894 | 82.1% |
| | HCC Exception | 80 | 8.2% | 121 | 11.1% |
| | Non-HCC Exception | 55 | 5.6% | 74 | 6.8% |
| 9 | No Exception | 904 | 80.6% | 1035 | 80.7% |
| | HCC Exception | 146 | 13% | 169 | 13.2% |
| | Non-HCC Exception | 71 | 6.3% | 79 | 6.2% |
| 10 | No Exception | 1032 | 85.4% | 1360 | 88.2% |
| | HCC Exception | 127 | 10.5% | 112 | 7.3% |
| | Non-HCC Exception | 49 | 4.1% | 70 | 4.5% |
| 11 | No Exception | 1543 | 85.6% | 1768 | 85.9% |
| | HCC Exception | 169 | 9.4% | 184 | 8.9% |
| | Non-HCC Exception | 91 | 5% | 107 | 5.2% |

Figure 13 and **Table 13** show the count and percent of deceased donor liver-alone transplant recipients by recipient age (0-2 years, 3-11, 12-17 years, or 18+ years). In all age categories, the majority of recipients did not have an exception at the time of transplant.

Figure 13. Count and Percent of Deceased Donor Liver-Alone Transplant Recipients by Exception Type, Recipient Age, and Era

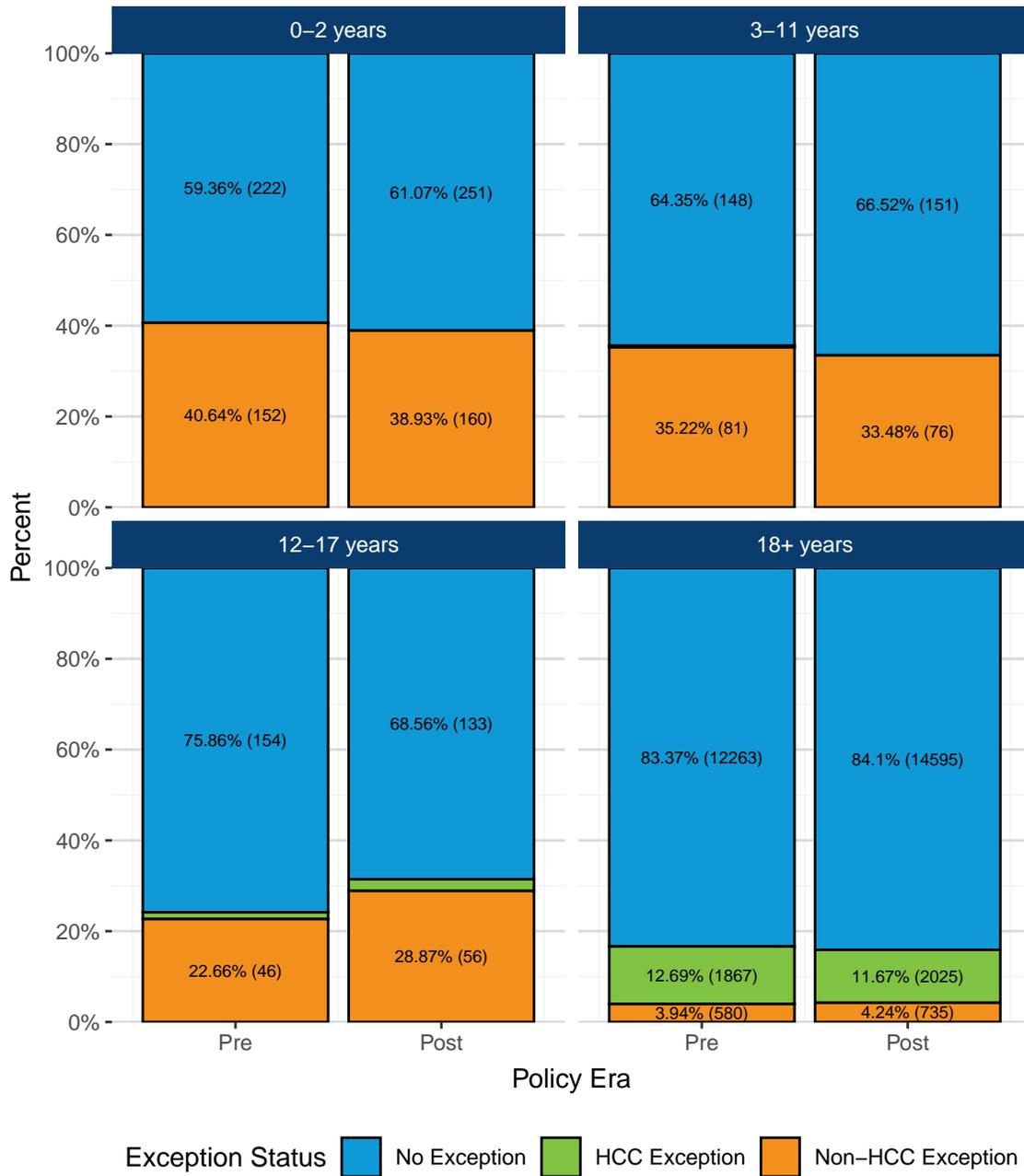


Table 13. Count and Percent of Deceased Donor Liver-Alone Transplant Recipients by Exception Type, Recipient Age, and Era

| Recipient Age | Exception Type | Pre-Policy | | Post-Policy | |
|---------------|-------------------|------------|-------|-------------|-------|
| | | N | % | N | % |
| 0-2 years | No Exception | 222 | 59.4% | 251 | 61.1% |
| | Non-HCC Exception | 152 | 40.6% | 160 | 38.9% |
| 3-11 years | No Exception | 148 | 64.3% | 151 | 66.5% |
| | HCC Exception | 1 | 0.4% | 0 | 0.0% |
| | Non-HCC Exception | 81 | 35.2% | 76 | 33.5% |
| 12-17 years | No Exception | 154 | 75.9% | 133 | 68.6% |
| | HCC Exception | 3 | 1.5% | 5 | 2.6% |
| | Non-HCC Exception | 46 | 22.7% | 56 | 28.9% |
| 18+ years | No Exception | 12263 | 83.4% | 14595 | 84.1% |
| | HCC Exception | 1867 | 12.7% | 2025 | 11.7% |
| | Non-HCC Exception | 580 | 3.9% | 735 | 4.2% |

Figure 14 and **Table 14** show the distribution of allocation MELD or PELD score or status at transplant for liver-alone transplant recipients by exception type and era. The proportion of candidates in Status 1A/1B remained similar pre- to post-policy. After excluding Status 1A/1B candidates from the analysis (since they do not receive allocation MELD or PELD scores), the median allocation MELD or PELD score at transplant among liver-alone recipients with no exceptions was 29 pre-policy and 29 post-policy; the median allocation MELD or PELD score at transplant among liver-alone recipients with HCC exceptions was 26 pre-policy and 27 post-policy; and the median allocation MELD or PELD score at transplant among liver-alone recipients with non-HCC exceptions was 27 pre-policy and 29 post-policy. MELD 3.0/PELD-Cr was implemented midway through the post-policy period (July 13, 2023), after which PELD scores have a higher minimum value than under the previous PELD model (i.e., prior to July 13, 2023, allocation PELD scores could range from -99 to 99, but starting on July 13, 2023, allocation PELD scores range from 6 to 99).

Similar trends were seen when the distribution of allocation MELD or PELD score at transplant was examined by OPTN Region (**Appendix Figure 13**, **Appendix Figure 14**, **Appendix Figure 15**, and **Appendix Table 10**). However, the extent to which the median and interquartile range changed pre- to post-policy varied by OPTN region.

Figure 14. Distribution of Allocation MELD or PELD Score or Status at Transplant for Liver-Alone Transplant Recipients by Exception Type and Era

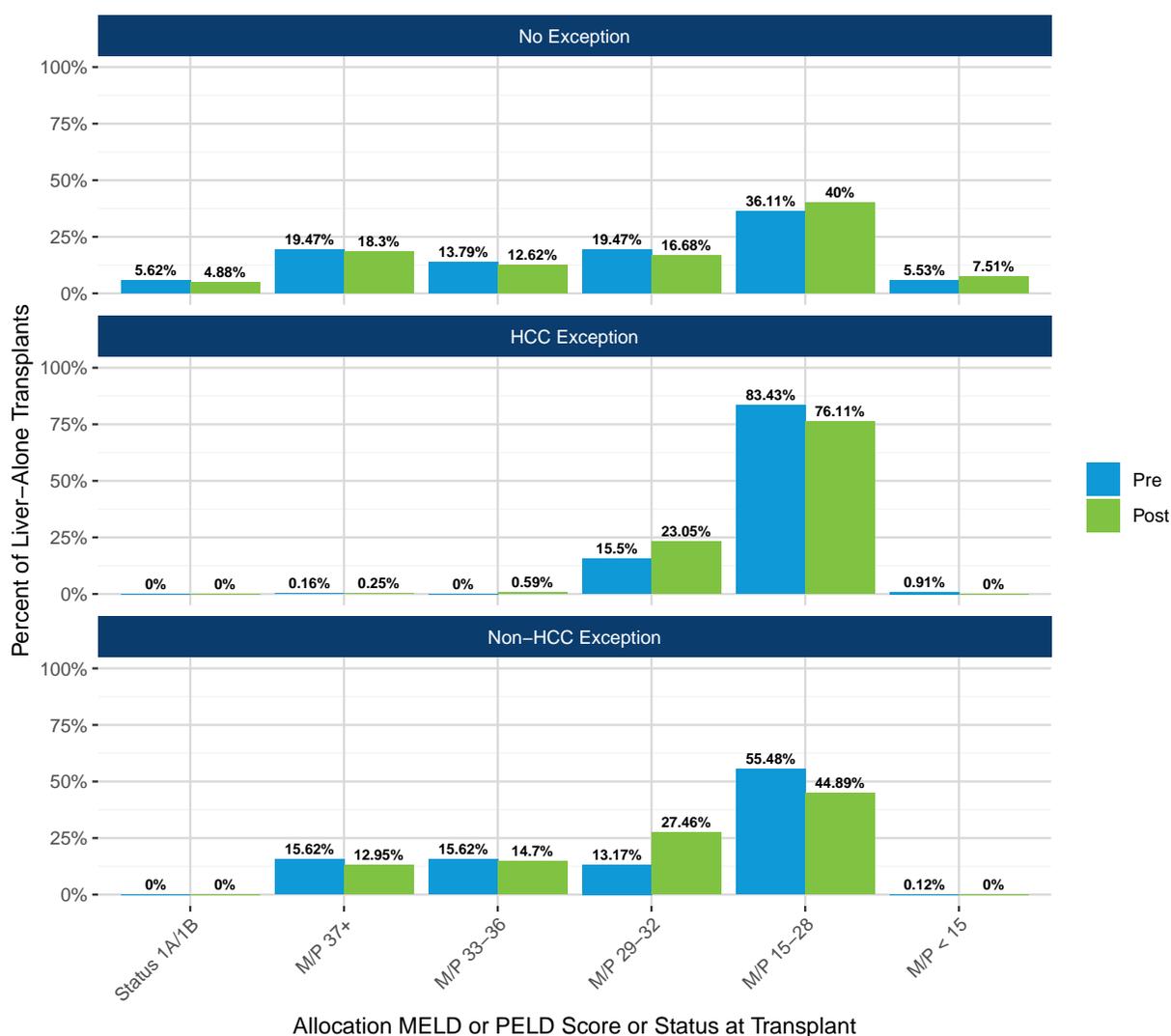
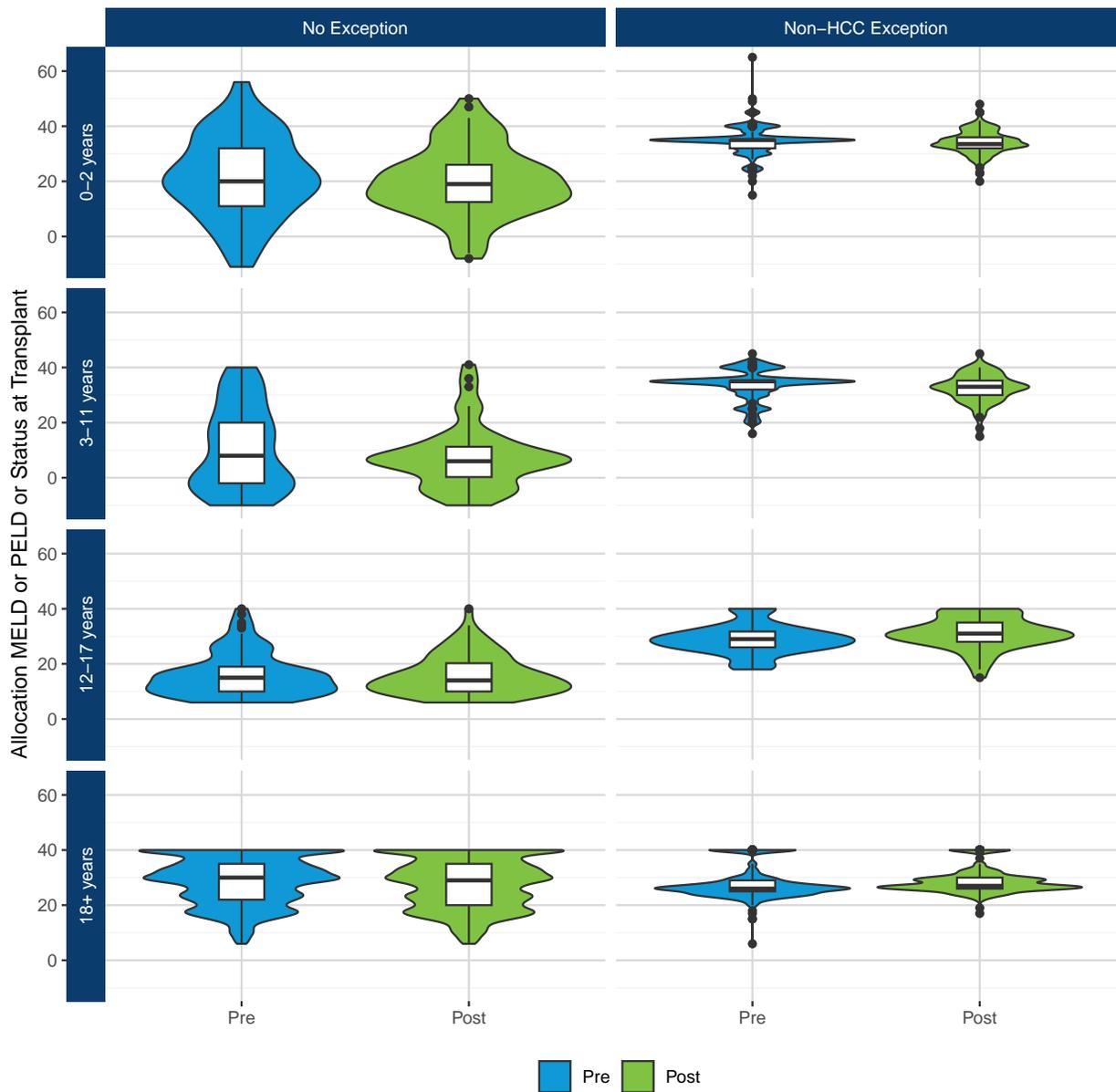


Table 14. Distribution of Allocation MELD or PELD Score at Transplant by Exception Type and Era

| Exception Type | Policy Era | N | Minimum | 25th Per- centile | Median | 75th Per- centile | Maximum | Interquartile Range |
|----------------------|------------|-------|---------|----------------------|--------|----------------------|---------|------------------------|
| No Exception | Pre | 12069 | -11 | 22 | 29 | 35 | 56 | 13 |
| | Post | 14391 | -10 | 20 | 29 | 35 | 50 | 15 |
| HCC Exception | Pre | 1871 | 6 | 24 | 26 | 27 | 40 | 3 |
| | Post | 2030 | 15 | 26 | 27 | 28 | 40 | 2 |
| Non-HCC Exception | Pre | 858 | 6 | 25 | 27 | 35 | 65 | 10 |
| | Post | 1027 | 15 | 26 | 29 | 33 | 48 | 7 |

Figure 15 and **Table 15** show the distribution of allocation MELD or PELD score at transplant for liver-alone transplant recipients by recipient age, exception type, and era. Due to the small number of HCC exceptions within some age groups, HCC exceptions are only shown in the table (not the figure). For pediatric age groups (<18 years), the median MELD or PELD score at transplant tended to be lower for recipients who were transplanted without exceptions compared to those who were transplanted with HCC or non-HCC exceptions; for adult age groups (18+ years), the median MELD or PELD score at transplant was slightly higher for recipients who were transplanted without exceptions compared to those who were transplanted with exceptions. Within each exception type and age group, the median MELD or PELD score tended to be similar pre- versus post-policy. Pediatric age groups exhibited more variability in scores, as indicated by the wider interquartile ranges. This variability is likely due to the small number of recipients in these age categories. MELD 3.0/PELD-Cr was implemented midway through the post-policy period (July 13, 2023), after which PELD scores have a higher minimum value than under the previous PELD model (i.e., prior to July 13, 2023, allocation PELD scores could range from -99 to 99, but starting on July 13, 2023, allocation PELD scores range from 6 to 99).

Figure 15. Distribution of Allocation MELD or PELD Score or Status at Transplant for Liver-Along Transplant Recipients by Exception Type, Recipient Age, and Era



*Only 1 pediatric recipient had an HCC exception.

Table 15. Summary of Allocation MELD or PELD Score at Transplant by Exception Type, Recipient Age, and Era

| Exception Type | Recipient Age | Policy Era | N | Minimum | 25th Per-centile | Median | 75th Per-centile | Maximum | Interquartile Range | |
|-------------------|---------------|------------|-------|---------|------------------|--------|------------------|---------|---------------------|-----|
| No Exception | 0-2 years | Pre | 81 | -11 | 11.0 | 20.0 | 32.0 | 56 | 21.0 | |
| | | Post | 75 | -8 | 12.5 | 19.0 | 26.0 | 50 | 13.5 | |
| | 3-11 years | Pre | 58 | -10 | -2.0 | 8.0 | 20.0 | 40 | 22.0 | |
| | | Post | 52 | -10 | 0.2 | 6.0 | 11.2 | 41 | 11.0 | |
| | 12-17 years | Pre | 89 | 6 | 10.0 | 15.0 | 19.0 | 40 | 9.0 | |
| | | Post | 80 | 6 | 10.0 | 14.0 | 20.2 | 40 | 10.2 | |
| | 18+ years | Pre | 11841 | 6 | 22.0 | 30.0 | 35.0 | 40 | 13.0 | |
| | | Post | 14184 | 6 | 20.0 | 29.0 | 35.0 | 40 | 15.0 | |
| | HCC Exception | 0-2 years | Pre | 0 | 0 | 0.0 | 0.0 | 0.0 | 0 | 0.0 |
| | | | Post | 0 | 0 | 0.0 | 0.0 | 0.0 | 0 | 0.0 |
| 3-11 years | | Pre | 1 | 32 | 32.0 | 32.0 | 32.0 | 32 | 0.0 | |
| | | Post | 0 | 0 | 0.0 | 0.0 | 0.0 | 0 | 0.0 | |
| 12-17 years | | Pre | 3 | 40 | 40.0 | 40.0 | 40.0 | 40 | 0.0 | |
| | | Post | 5 | 40 | 40.0 | 40.0 | 40.0 | 40 | 0.0 | |
| 18+ years | | Pre | 1867 | 6 | 24.0 | 26.0 | 27.0 | 32 | 3.0 | |
| | | Post | 2025 | 15 | 26.0 | 27.0 | 28.0 | 35 | 2.0 | |
| Non-HCC Exception | | 0-2 years | Pre | 151 | 15 | 32.0 | 35.0 | 35.0 | 65 | 3.0 |
| | | | Post | 160 | 20 | 32.0 | 33.5 | 36.0 | 48 | 4.0 |
| | 3-11 years | Pre | 81 | 16 | 32.0 | 35.0 | 35.0 | 45 | 3.0 | |
| | | Post | 76 | 15 | 30.0 | 33.0 | 35.2 | 45 | 5.2 | |
| | 12-17 years | Pre | 46 | 18 | 26.0 | 29.0 | 31.8 | 40 | 5.8 | |
| | | Post | 56 | 15 | 28.0 | 31.0 | 35.0 | 40 | 7.0 | |
| | 18+ years | Pre | 580 | 6 | 25.0 | 26.0 | 29.0 | 40 | 4.0 | |
| | | Post | 735 | 17 | 26.0 | 27.0 | 30.0 | 40 | 4.0 | |

Figure 16 and **Table 16** show the distribution of median MELD at transplant (MMaT) at time of transplant by exception type and policy era for adult liver-alone transplant recipients who were transplanted with exceptions. The median MMaT at transplant among adult liver-alone recipients with HCC exceptions increased slightly from 29 pre-policy to 30 post-policy. The interquartile range of MMaT scores became narrower across policy eras (Pre: 27 to 30; Post: 29 to 31). The median MMaT at transplant among adult liver-alone recipients with non-HCC exceptions increased slightly from 29 pre-policy to 30 post-policy. The interquartile range became narrower as well, ranging from 27 to 30 in the pre-policy era and from 29 to 31 in the post-policy era.

When examined by OPTN Region, the MMaT at transplant for liver-alone transplant recipients with HCC exceptions decreased pre- to post-policy for OPTN Region 10 and increased pre- to post-policy for all other OPTN Regions (**Appendix Figure 19**). The MMaT at transplant for liver-alone transplant recipients with non-HCC exceptions decreased pre- to post-policy for OPTN Regions 4, 6, and 9 and increased for all other OPTN Regions (**Appendix Figure 20**). The extent to which the median and interquartile range changed pre- to post-policy varied by region (**Appendix Table 12**).

The distribution of median PELD at transplant (MPaT) is not shown, as this policy did not impact how MPaT values are calculated; moreover, MPaT is a single, national value. MPaT was equal to 35 for the majority of the study period examined in this report, but decreased to 33 during the March 2023 update. Thus, MPaT was lower during the second half of the post-policy era compared to the rest of the study period. In the September 2024 update, MPaT further decreased to 31.

Figure 16. Distribution of Median MELD at Transplant (MMaT) at Time of Transplant by Exception Type and Era for Adult Liver-Alone Transplant Recipients who were Transplanted with Exceptions

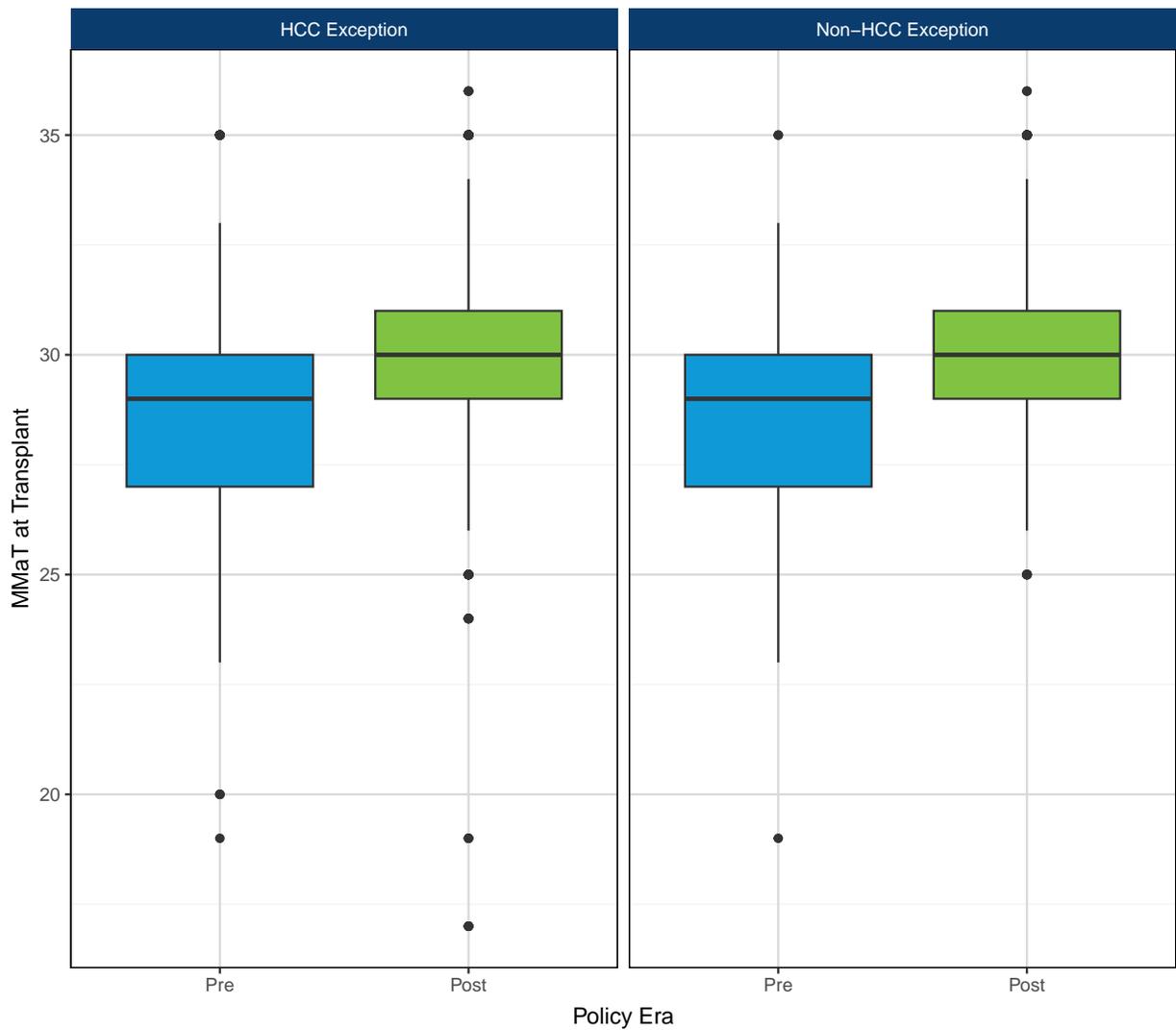


Table 16. Distribution of Median MELD at Transplant (MMaT) at Time of Transplant by Exception Type and Era for Adult Liver-Along Transplant Recipients who were Transplanted with Exceptions

| Exception Type | Policy Era | N | Minimum | 25th Per- centile | Median | 75th Per- centile | Maximum | Interquartile Range |
|----------------------|------------|------|---------|----------------------|--------|----------------------|---------|------------------------|
| HCC Exception | Pre | 1867 | 19 | 27 | 29 | 30 | 35 | 3 |
| | Post | 2025 | 17 | 29 | 30 | 31 | 36 | 2 |
| Non-HCC Exception | Pre | 580 | 19 | 27 | 29 | 30 | 35 | 3 |
| | Post | 735 | 25 | 29 | 30 | 31 | 36 | 2 |

Figure 17 and **Table 17** show the number and percent of adult deceased donor liver-alone transplants by recipient age, donor age, and era. The donor age distributions of adult deceased donor liver-alone transplants remained fairly similar pre- and post-policy. The majority of adult deceased donor liver-alone transplant recipients received livers from adult donors.

Figure 17. Number and Percent of Adult Deceased Donor Liver-Along Transplants by Recipient Age, Donor Age, and Era

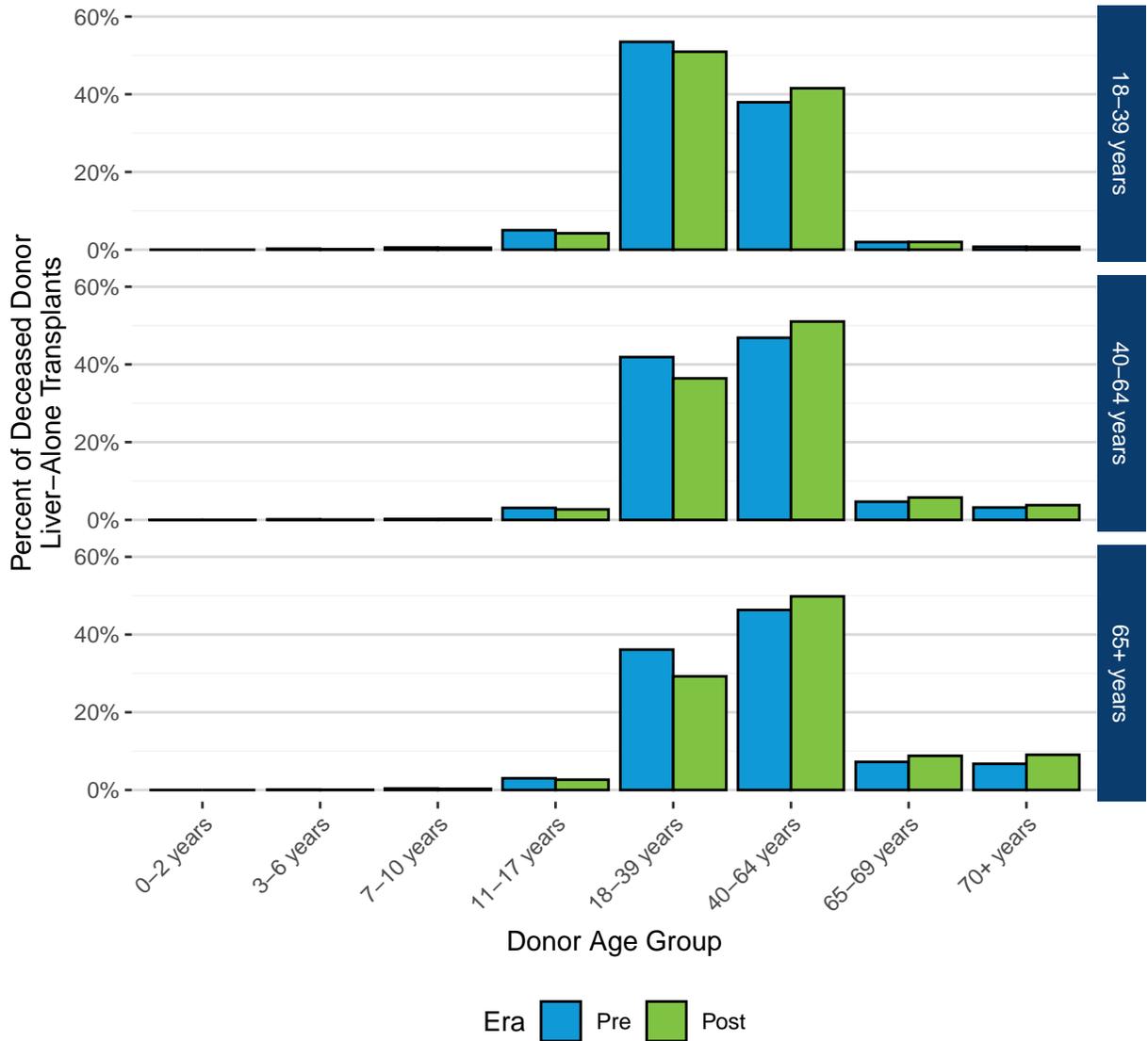


Table 17. Number and Percent of Adult Deceased Donor Liver-Alone Transplants by Recipient Age, Donor Age, and Era

| Recipient Age | Donor Age | Pre-Policy | Post-Policy |
|---------------|-------------|----------------|-----------------|
| 18-39 years | 0-2 years | 0 (0.0%) | 0 (0.0%) |
| | 3-6 years | 5 (0.3%) | 2 (0.1%) |
| | 7-10 years | 11 (0.6%) | 12 (0.5%) |
| | 11-17 years | 100 (5.0%) | 100 (4.2%) |
| | 18-39 years | 1,063 (53.5%) | 1,205 (50.9%) |
| | 40-64 years | 754 (37.9%) | 983 (41.5%) |
| | 65-69 years | 39 (2.0%) | 47 (2.0%) |
| | 70+ years | 15 (0.8%) | 17 (0.7%) |
| | Total | 1,987 (100.0%) | 2,366 (100.0%) |
| 40-64 years | 0-2 years | 1 (0.0%) | 1 (0.0%) |
| | 3-6 years | 11 (0.1%) | 7 (0.1%) |
| | 7-10 years | 20 (0.2%) | 27 (0.2%) |
| | 11-17 years | 290 (3.1%) | 303 (2.7%) |
| | 18-39 years | 3,962 (41.9%) | 4,075 (36.4%) |
| | 40-64 years | 4,434 (46.9%) | 5,708 (51.0%) |
| | 65-69 years | 442 (4.7%) | 643 (5.7%) |
| | 70+ years | 302 (3.2%) | 422 (3.8%) |
| | Total | 9,462 (100.0%) | 11,186 (100.0%) |
| 65+ years | 0-2 years | 0 (0.0%) | 0 (0.0%) |
| | 3-6 years | 4 (0.1%) | 2 (0.1%) |
| | 7-10 years | 13 (0.4%) | 12 (0.3%) |
| | 11-17 years | 99 (3.0%) | 101 (2.7%) |
| | 18-39 years | 1,178 (36.1%) | 1,113 (29.3%) |
| | 40-64 years | 1,511 (46.3%) | 1,895 (49.8%) |
| | 65-69 years | 236 (7.2%) | 335 (8.8%) |
| | 70+ years | 220 (6.7%) | 345 (9.1%) |
| | Total | 3,261 (100.0%) | 3,803 (100.0%) |

Figure 18 and **Table 18** show the number and percent of pediatric deceased donor liver-alone transplants by recipient age, donor age, and era. The distribution of pediatric transplants by donor age remained fairly similar pre- and post-policy, although the distribution did shift slightly for recipients aged 0-2 years and 7-11 years. Compared to the pre-policy period, pediatric recipients aged 0-2 years received a lower proportion of livers from donors aged 0-2 years post-policy, and a higher proportion of livers from donors aged 11-17 years post-policy. Pediatric recipients aged 7-11 years received a higher proportion of livers from donors aged 0-2, and 3-6 years post-policy compared to pre-policy, and a lower proportion of livers from donors aged 7-10 years post-policy compared to pre-policy.

Figure 18. Number and Percent of Pediatric Deceased Donor Liver-Alone Transplants by Recipient Age, Donor Age, and Era

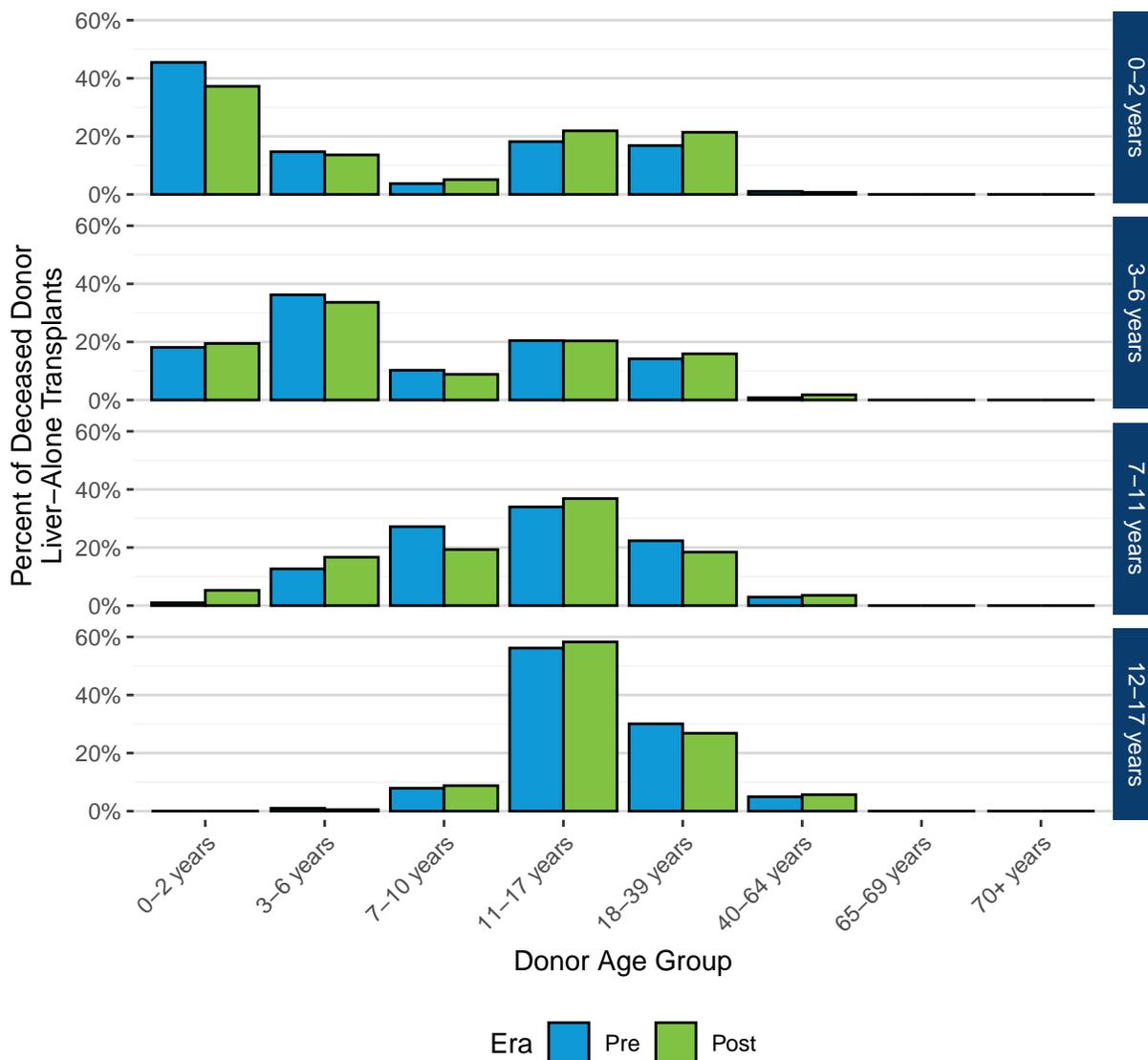


Table 18. Number and Percent of Pediatric Deceased Donor Liver-Alone Transplants by Recipient Age, Donor Age, and Era

| Recipient Age | Donor Age | Pre-Policy | Post-Policy |
|---------------|-------------|--------------|--------------|
| 0-2 years | 0-2 years | 170 (45.5%) | 153 (37.2%) |
| | 3-6 years | 55 (14.7%) | 56 (13.6%) |
| | 7-10 years | 14 (3.7%) | 21 (5.1%) |
| | 11-17 years | 68 (18.2%) | 90 (21.9%) |
| | 18-39 years | 63 (16.8%) | 88 (21.4%) |
| | 40-64 years | 4 (1.1%) | 3 (0.7%) |
| | 65-69 years | 0 (0.0%) | 0 (0.0%) |
| | 70+ years | 0 (0.0%) | 0 (0.0%) |
| | Total | 374 (100.0%) | 411 (100.0%) |
| 3-6 years | 0-2 years | 23 (18.1%) | 22 (19.5%) |
| | 3-6 years | 46 (36.2%) | 38 (33.6%) |
| | 7-10 years | 13 (10.2%) | 10 (8.8%) |
| | 11-17 years | 26 (20.5%) | 23 (20.4%) |
| | 18-39 years | 18 (14.2%) | 18 (15.9%) |
| | 40-64 years | 1 (0.8%) | 2 (1.8%) |
| | 65-69 years | 0 (0.0%) | 0 (0.0%) |
| | 70+ years | 0 (0.0%) | 0 (0.0%) |
| | Total | 127 (100.0%) | 113 (100.0%) |
| 7-11 years | 0-2 years | 1 (1.0%) | 6 (5.3%) |
| | 3-6 years | 13 (12.6%) | 19 (16.7%) |
| | 7-10 years | 28 (27.2%) | 22 (19.3%) |
| | 11-17 years | 35 (34.0%) | 42 (36.8%) |
| | 18-39 years | 23 (22.3%) | 21 (18.4%) |
| | 40-64 years | 3 (2.9%) | 4 (3.5%) |
| | 65-69 years | 0 (0.0%) | 0 (0.0%) |
| | 70+ years | 0 (0.0%) | 0 (0.0%) |
| | Total | 103 (100.0%) | 114 (100.0%) |
| 12-17 years | 0-2 years | 0 (0.0%) | 0 (0.0%) |
| | 3-6 years | 2 (1.0%) | 1 (0.5%) |
| | 7-10 years | 16 (7.9%) | 17 (8.8%) |
| | 11-17 years | 114 (56.2%) | 113 (58.2%) |
| | 18-39 years | 61 (30.0%) | 52 (26.8%) |
| | 40-64 years | 10 (4.9%) | 11 (5.7%) |
| | 65-69 years | 0 (0.0%) | 0 (0.0%) |
| | 70+ years | 0 (0.0%) | 0 (0.0%) |
| | Total | 203 (100.0%) | 194 (100.0%) |

Comparison with Non-Exception Candidates and Recipients

The above results suggest that the spread of allocation scores for recipients transplanted with HCC or non-HCC exceptions became tighter around the median post-policy compared to pre-policy. The following analyses stratify waiting list removal rates and transplant rates for *non-exception* candidates by their allocation MELD or PELD score or status to help determine whether this convergence toward intermediate scores for exception candidates might have negatively impacted waiting list removal rates or transplant rates for non-exception candidates. Note that while the data changes incurred by this policy change preclude stratification of rates by allocation score for candidates with exceptions, rates for non-exception candidates can still be stratified by allocation score.

Figure 19 and **Table 19** show liver-alone waiting list removals for death or too sick to transplant per 100 person-years waiting for non-exception candidates by allocation score and era. Waiting list removal rates for non-exception candidates decreased slightly overall (Pre: 18.73 [18.06, 19.41] per 100 person-years, Post: 17.88 [17.18, 18.60] per 100 person-years). When stratified by allocation score, waiting list removal rates increased for candidates with allocation MELD or PELD 33 - 36 and decreased or remained steady for all other allocation score and status groups, although none of these differences were statistically significant.

Figure 19. Liver-Alone Waiting List Deaths or Removals for Too Sick Per 100 Person-Years Waiting for Non-Exception Candidates by Allocation MELD or PELD Score or Status and Era

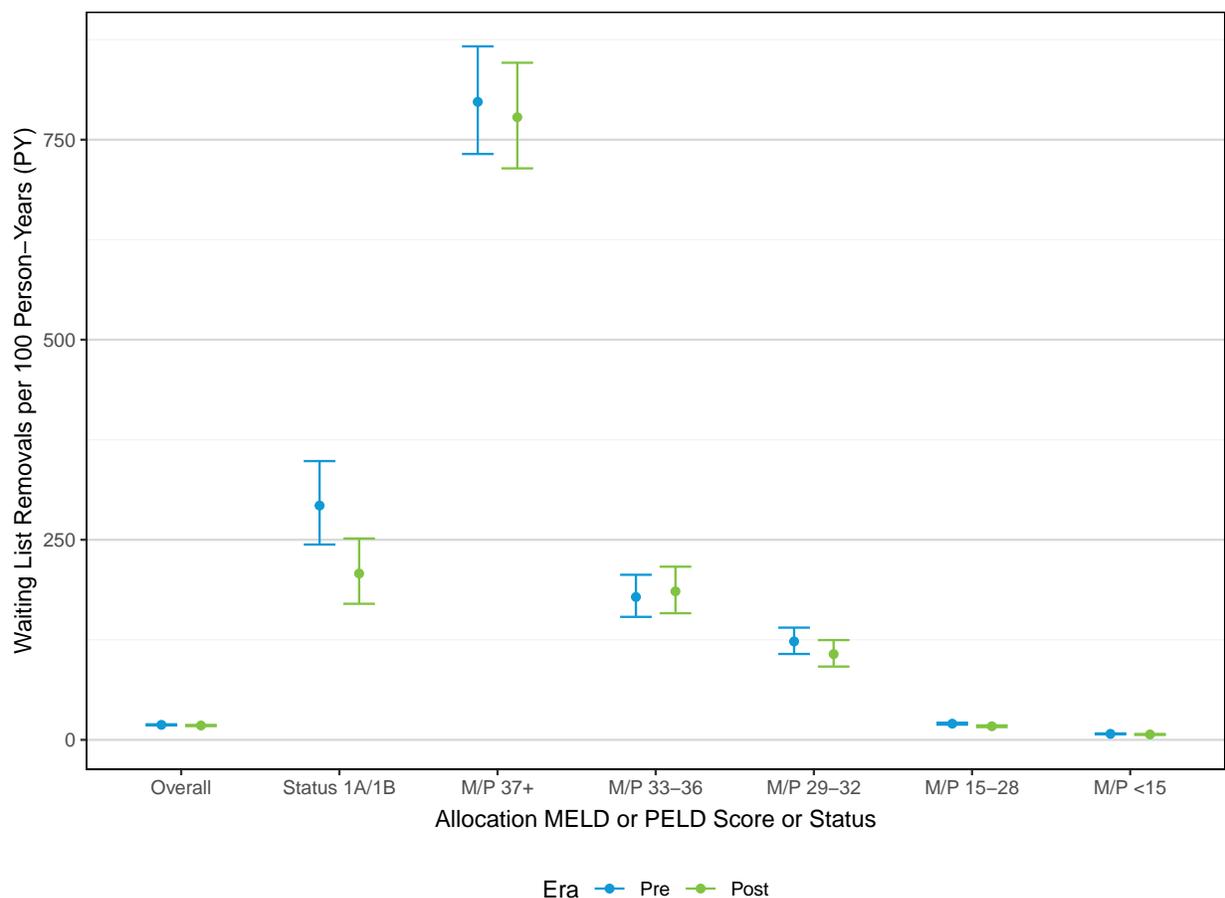


Table 19. Liver-Along Waiting List Deaths or Removals for Too Sick Per 100 Person-Years Waiting for Non-Exception Candidates by Allocation MELD or PELD Score or Status and Era

| Allocation MELD or PELD Score or Status | Era | Ever Waiting | Death/Too Sick Events | Person-Years | Removals per 100 PY | |
|---|------|-----------------|--------------------------|--------------|------------------------|------------------|
| | | N | N | PY | Estimate | 95% CI |
| Overall | Pre | 26550 | 2949 | 15747.7 | 18.73 | (18.06, 19.41) |
| | Post | 27402 | 2466 | 13789.3 | 17.88 | (17.18, 18.60) |
| Status 1A/1B | Pre | 996 | 127 | 43.4 | 292.77 | (244.07, 348.35) |
| | Post | 967 | 105 | 50.5 | 207.86 | (170.01, 251.63) |
| M/P 37+ | Pre | 3254 | 552 | 69.2 | 797.28 | (732.15, 866.65) |
| | Post | 3582 | 546 | 70.2 | 778.08 | (714.18, 846.17) |
| M/P 33-36 | Pre | 2968 | 184 | 103.1 | 178.51 | (153.65, 206.25) |
| | Post | 3161 | 163 | 87.8 | 185.60 | (158.20, 216.38) |
| M/P 29-32 | Pre | 4475 | 222 | 180.6 | 122.95 | (107.30, 140.23) |
| | Post | 4615 | 168 | 156.8 | 107.17 | (91.57, 124.65) |
| M/P 15-28 | Pre | 14383 | 1117 | 5533.7 | 20.19 | (19.02, 21.40) |
| | Post | 15420 | 937 | 5529.8 | 16.94 | (15.88, 18.07) |
| M/P <15 | Pre | 13311 | 712 | 9549.3 | 7.46 | (6.92, 8.02) |
| | Post | 12681 | 514 | 7648.4 | 6.72 | (6.15, 7.33) |

Figure 20 and **Table 20** show liver-alone transplant rates per 100 active person-years waiting for *non-exception* candidates by allocation score and era. There was a statistically significant increase in the overall transplant rate for non-exception candidates (Pre: 73.31 [71.98, 74.66] per 100 person-years, Post: 100.46 [98.80, 102.15] per 100 person-years). When stratified by allocation score, transplant rates decreased for Status 1A/1B candidates, and increased for non-exception candidates in all other allocation score groups (stayed constant in M/P 29 - 32 group). The decrease in the Status 1A/1B group was statistically significant.

Figure 20. Liver-Alone Transplant Rates Per 100 Active Person-Years Waiting for Non-Exception Candidates by Allocation MELD or PELD Score or Status and Era

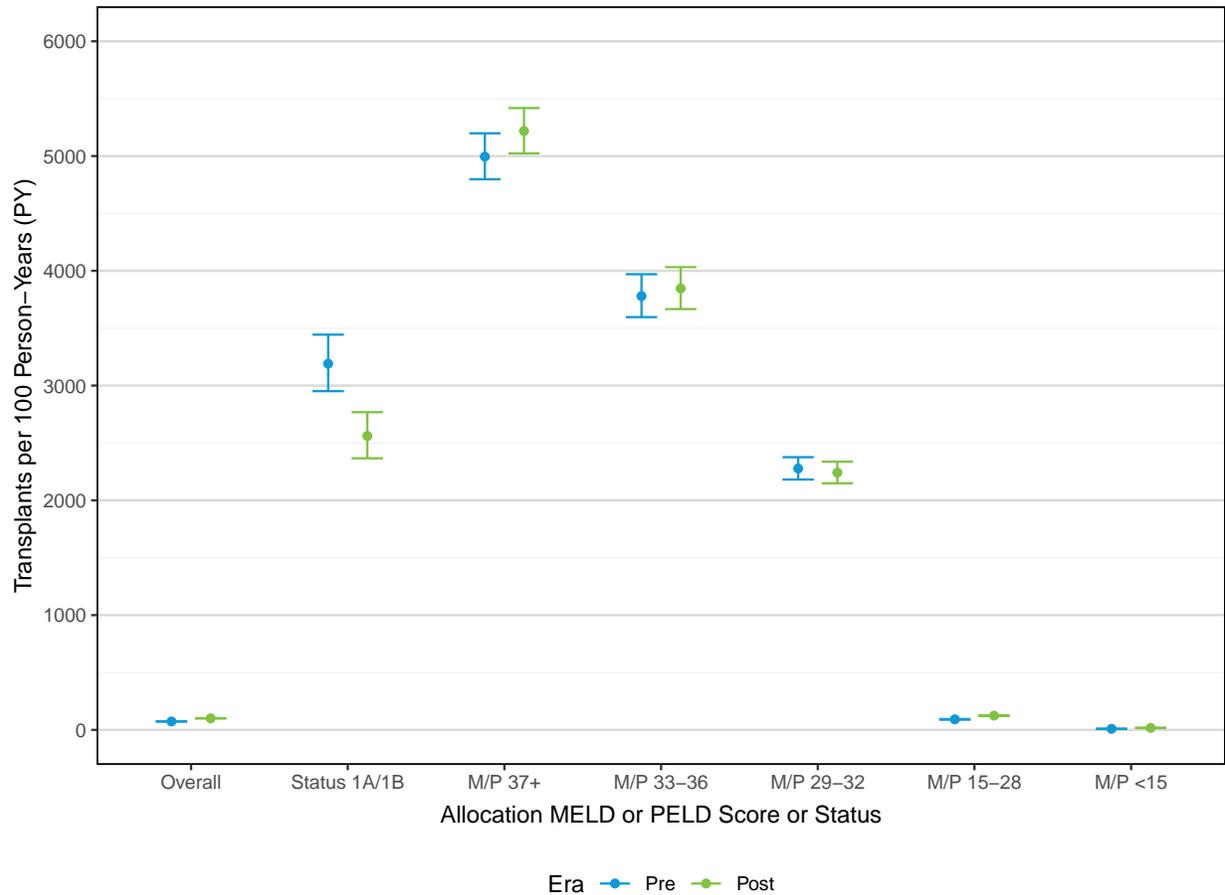


Table 20. Liver-Along Transplant Rates Per 100 Active Person-Years Waiting for Non-Exception Candidates by Allocation MELD or PELD Score or Status and Era

| Allocation MELD or PELD Score or Status | Era | Ever Waiting | Transplant Events | Active Person-Years | Transplants per 100 Active PY | |
|---|------|--------------|-------------------|---------------------|-------------------------------|--------------------|
| | | N | N | PY | Estimate | 95% CI |
| Overall | Pre | 26550 | 11545 | 15747.7 | 73.31 | (71.98, 74.66) |
| | Post | 27402 | 13853 | 13789.3 | 100.46 | (98.80, 102.15) |
| Status 1A/1B | Pre | 976 | 659 | 20.7 | 3190.54 | (2951.56, 3443.72) |
| | Post | 954 | 636 | 24.8 | 2561.12 | (2365.92, 2768.13) |
| M/P 37+ | Pre | 3217 | 2418 | 48.4 | 4995.02 | (4797.89, 5198.17) |
| | Post | 3549 | 2711 | 52.0 | 5218.14 | (5023.54, 5418.34) |
| M/P 33-36 | Pre | 2902 | 1591 | 42.1 | 3779.96 | (3596.48, 3970.37) |
| | Post | 3130 | 1722 | 44.8 | 3846.10 | (3666.57, 4032.15) |
| M/P 29-32 | Pre | 4402 | 2131 | 93.6 | 2277.11 | (2181.44, 2375.89) |
| | Post | 4562 | 2199 | 98.1 | 2241.62 | (2148.90, 2337.31) |
| M/P 15-28 | Pre | 13868 | 4077 | 4461.7 | 91.38 | (88.59, 94.23) |
| | Post | 14986 | 5581 | 4496.0 | 124.13 | (120.90, 127.43) |
| M/P <15 | Pre | 12251 | 669 | 7489.8 | 8.93 | (8.27, 9.64) |
| | Post | 11804 | 1004 | 5816.8 | 17.26 | (16.21, 18.36) |

Ongoing review of National Liver Review Board (NLRB) Diagnoses (January 2022 PC)

This section of the report examines the impact of the ischemic cholangiopathy (IC) and polycystic liver disease (PLD) guidance documents that were implemented on July 26, 2022.

Ischemic Cholangiopathy Guidance

This guidance recommends that candidates meeting criteria for an exception be assigned a score equal to MMaT. Prior to this guidance, there was no score recommendation for IC. IC is a complication associated with livers from donation after cardiac death (DCD) donors, and this change will allow these candidates to access re-transplant more quickly. For more detailed information regarding the changes, see the policy notice document.

This guidance was implemented on July 26, 2022. The guidance is evaluated one year post implementation, with the pre-guidance era spanning from 07/26/2020 to 07/25/2022 and post-guidance era spanning from 07/26/2022 to 07/25/2024. Initial and extension requests are included in these analyses, but results are not stratified by application type due to small sample sizes. The following metrics were evaluated:

- Count of exception forms submitted with an ischemic cholangiopathy diagnosis and distribution of score adjustment requested
- Count of transplants with an ischemic cholangiopathy diagnosis and distribution of MELD or PELD score at transplant

Figure 21 and **Table 21** show the distribution of score adjustment requested for initial and extension ischemic cholangiopathy exception requests by guidance era. There were 182 ischemic cholangiopathy exception requests pre-guidance and 196 ischemic cholangiopathy exception requests post-guidance. The median score adjustment requested for ischemic cholangiopathy exceptions increased from -3 pre-guidance to 0 post-guidance. The interquartile range, which captures the middle 50% of score adjustments requested, remained the same in both guidance eras (Pre: 3, Post: 3).

Figure 21. Distribution of MELD or PELD Score Adjustment Requested for Ischemic Cholangiopathy Exceptions

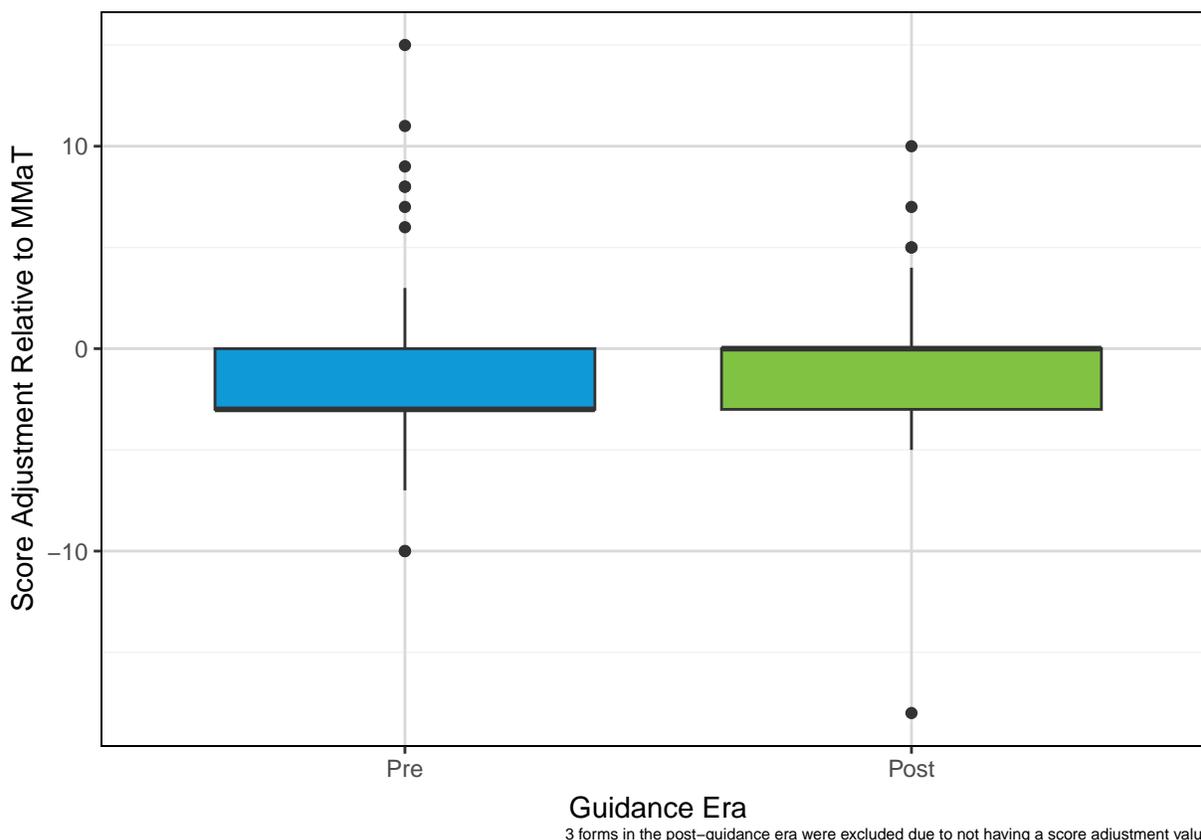


Table 21. Distribution of MELD or PELD Score Adjustment Requested for Ischemic Cholangiopathy Exceptions

| Era | Minimum | 25th Percentile | Median | 75th Percentile | Maximum | Interquartile Range | Number of Forms | Forms Missing Score Adjustment |
|------|---------|-----------------|--------|-----------------|---------|---------------------|-----------------|--------------------------------|
| Pre | -10 | -3 | -3 | 0 | 15 | 3 | 182 | 0 |
| Post | -18 | -3 | 0 | 0 | 10 | 3 | 196 | 3 |

3 forms in the post-guidance era were excluded due to not having a score adjustment value.

Based on OPTN data as of 2025-01-03

Data subject to change based on future data submission or correction

Table 22 shows the distribution of MELD or PELD score at transplant for ischemic cholangiopathy transplant recipients by guidance era. There were 9 ischemic cholangiopathy transplants pre-guidance. 7 of these recipients were transplanted with an exception (77.78%). For comparison, 20 ischemic cholangiopathy transplants occurred post-guidance, and 16 of these recipients were transplanted with an exception (80%). The median MELD or PELD score at transplant for ischemic cholangiopathy transplant recipients decreased from 30 pre-guidance to 29 post-guidance. The interquartile range, which captures the middle 50% of score adjustments requested, decreased from 4 pre-guidance to 1 post-guidance. Given the small number of ischemic cholangiopathy transplants that occurred in both guidance eras, these results should be interpreted cautiously.

Table 22. Distribution of MELD or PELD Score at Transplant for Ischemic Cholangiopathy Transplant Recipients

| Era | Minimum | 25th Percentile | Median | 75th Percentile | Maximum | Interquartile Range | Number of Transplants | Number of Exceptions |
|------|---------|-----------------|--------|-----------------|---------|---------------------|-----------------------|----------------------|
| Pre | 26 | 27 | 30 | 31 | 33 | 4 | 9 | 7 |
| Post | 25 | 29 | 29 | 30 | 31 | 1 | 20 | 16 |

Based on OPTN data as of 2025-01-03

Data subject to change based on future data submission or correction

Polycystic Liver Disease (PLD) Guidance

This guidance includes a more objective definition for moderate to severe protein calorie malnutrition, adds sarcopenia as a qualifying comorbidity, removes unnecessary language, and recommends all candidates meeting criteria be considered for MMaT. Prior to this guidance, there was no score recommendation for PLD. For more detailed information regarding the changes see the policy notice document.

This guidance was implemented on July 26, 2022. The guidance is evaluated one year post implementation, with the pre-guidance era spanning from 07/26/2020 to 07/25/2022 and post-guidance era spanning from 07/26/2022 to 07/25/2024. Initial and extension requests are included in these analyses, but results are not stratified by application type due to small sample sizes. The following metrics were evaluated:

- Count of exception forms submitted with a PLD diagnosis and distribution of MELD or PELD score requested
- Count of transplants with a PLD diagnosis and distribution of MELD or PELD score at transplant

Figure 22 and **Table 23** show the distribution of score adjustment requested for initial and extension polycystic liver disease exception requests by guidance era. There were 356 polycystic liver disease exception requests pre-guidance and 323 polycystic liver disease exception requests post-guidance. The median score adjustment requested for polycystic liver disease exceptions increased from -3 pre-guidance to 0 post-guidance.

Figure 22. Distribution of MELD or PELD Score Adjustment Requested for Polycystic Liver Disease Exceptions

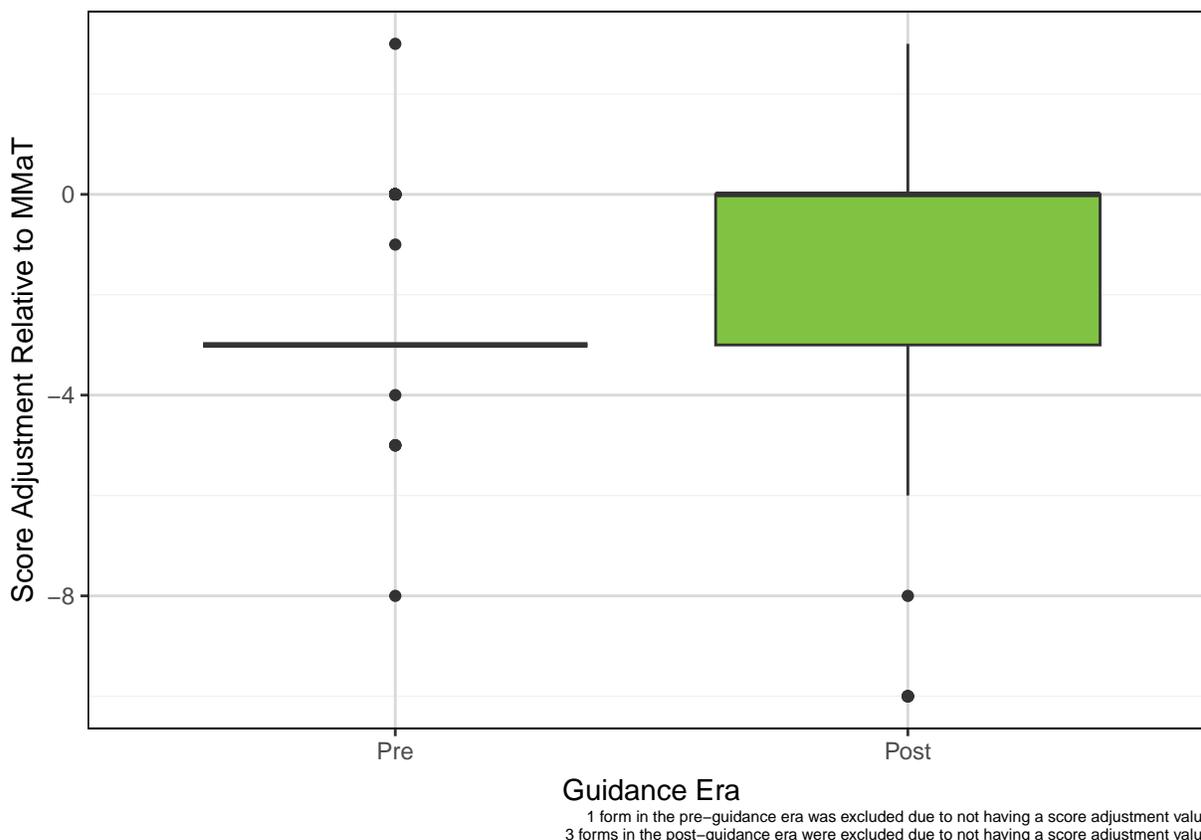


Table 23. Distribution of MELD or PELD Score Adjustment Requested for Polycystic Liver Disease Exceptions

| Era | Minimum | 25th Percentile | Median | 75th Percentile | Maximum | Interquartile Range | Number of Forms | Forms Missing Score Adjustment |
|------|---------|-----------------|--------|-----------------|---------|---------------------|-----------------|--------------------------------|
| Pre | -8 | -3 | -3 | -3 | 3 | 0 | 356 | 1 |
| Post | -10 | -3 | 0 | 0 | 3 | 3 | 323 | 3 |

1 form in the pre-guidance era was excluded due to not having a score adjustment value.
 3 forms in the post-guidance era were excluded due to not having a score adjustment value.
 Based on OPTN data as of 2025-01-03
 Data subject to change based on future data submission or correction

Table 24 shows the distribution of MELD or PELD score at transplant for polycystic liver disease transplant recipients by guidance era. There were 39 polycystic liver disease transplants pre-guidance. 23 of these recipients were transplanted with an exception (58.97%). For comparison, 71 polycystic liver disease transplants occurred post-guidance. 59 of these recipients were transplanted with an exception (83.1%). The median MELD or PELD score at transplant for polycystic liver disease transplant recipients increased from 26 pre-guidance to 30 post-guidance. The interquartile range, which captures the middle 50% of score adjustments requested, decreased from 5 pre-guidance to 3 post-guidance.

Table 24. Distribution of MELD or PELD Score at Transplant for Polycystic Liver Disease Transplant Recipients

| Era | Minimum | 25th Percentile | Median | 75th Percentile | Maximum | Interquartile Range | Number of Transplants | Number of Exceptions |
|------|---------|-----------------|--------|-----------------|---------|---------------------|-----------------------|----------------------|
| Pre | 7 | 24 | 26 | 29 | 35 | 5 | 39 | 23 |
| Post | 6 | 28 | 30 | 31 | 40 | 3 | 71 | 59 |

Based on OPTN data as of 2025-01-03

Data subject to change based on future data submission or correction

Conclusion

After implementation of the MMaT around the donor hospital policy, waiting list removal rates due to death or too sick tended to decrease while transplant rates tended to increase, regardless of exception type. The median score adjustment requested for standard initial and extension MELD or PELD exceptions remained similar across policy eras. The median allocation MELD or PELD score at transplant remained the same or increased slightly pre- to post-policy. The median MMaT at transplant for adult liver-alone transplant recipients who were transplanted with exceptions increased slightly pre- to post-policy as well. For all exception types, the interquartile range of requested score adjustments, allocation MELD or PELD at transplant, and MMaT at transplant were similar under the new MMaT around the donor hospital policy. Similar results were obtained when examined by OPTN Region.

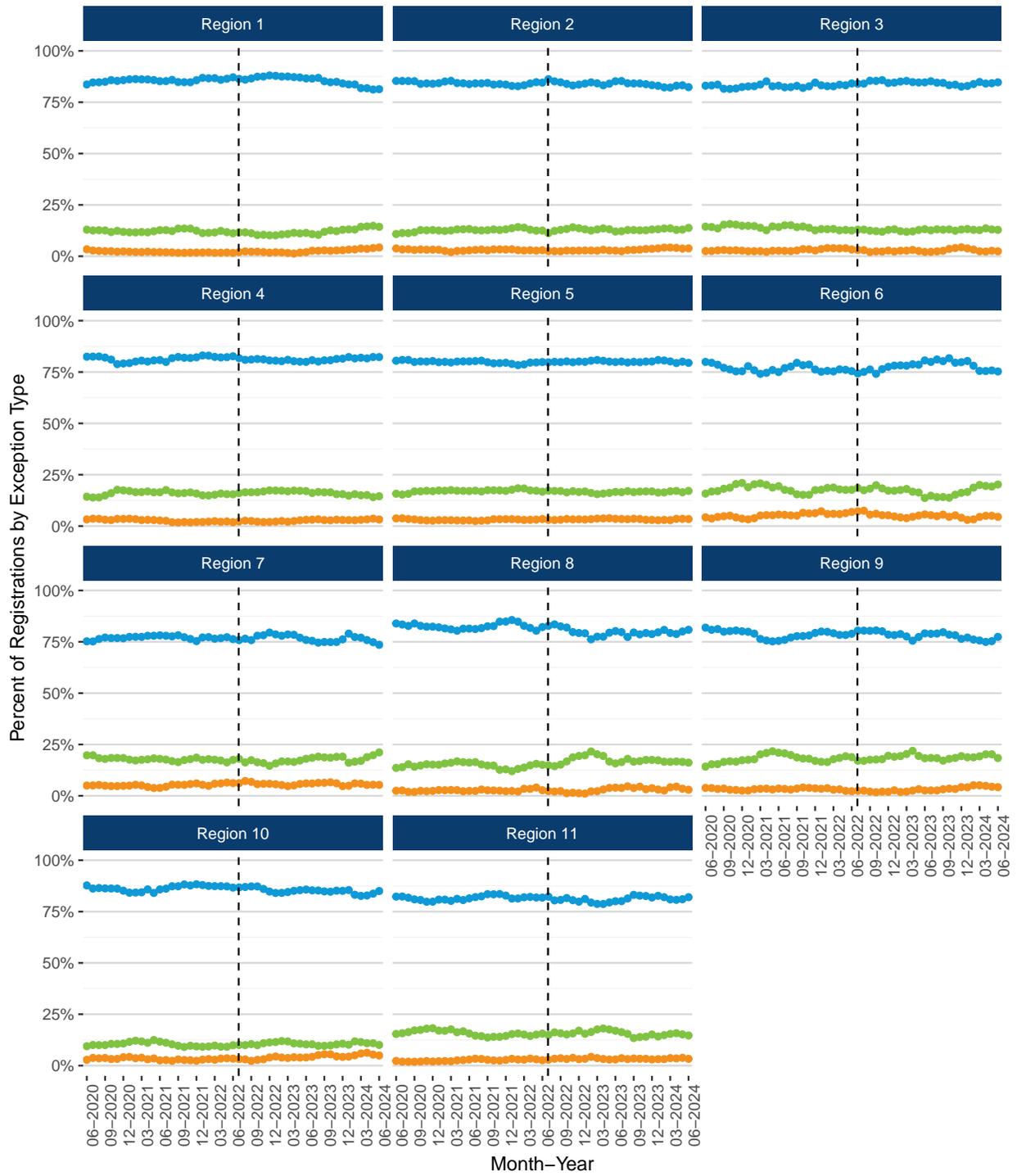
In terms of the ischemic cholangiopathy and polycystic liver disease guidances, the median score adjustment requested for exception candidates with these diagnoses tended to increase pre- versus post-guidance, as intended. Similarly, for transplant recipients with these diagnoses, the median allocation MELD or PELD score at transplant increased pre- to post-guidance (larger increase in polycystic liver disease than in ischemic cholangiopathy).

Appendix

This section contains supplementary tables and figures to support the key results shown in the main report.

Waiting List

Appendix Figure 1. Percent of Liver Waiting List Registrations at the End of each Month by Exception Type and OPTN Region



Exception Type — No Exception — HCC Exception — Non-HCC Exception

Dotted line represents implementation of MMaT around the donor hospital on June 28, 2022.

Appendix Figure 2. Liver-Alone Waiting List Deaths or Removals for Too Sick Per 100 Person-Years Waiting by OPTN Region, Exception Type, and Era



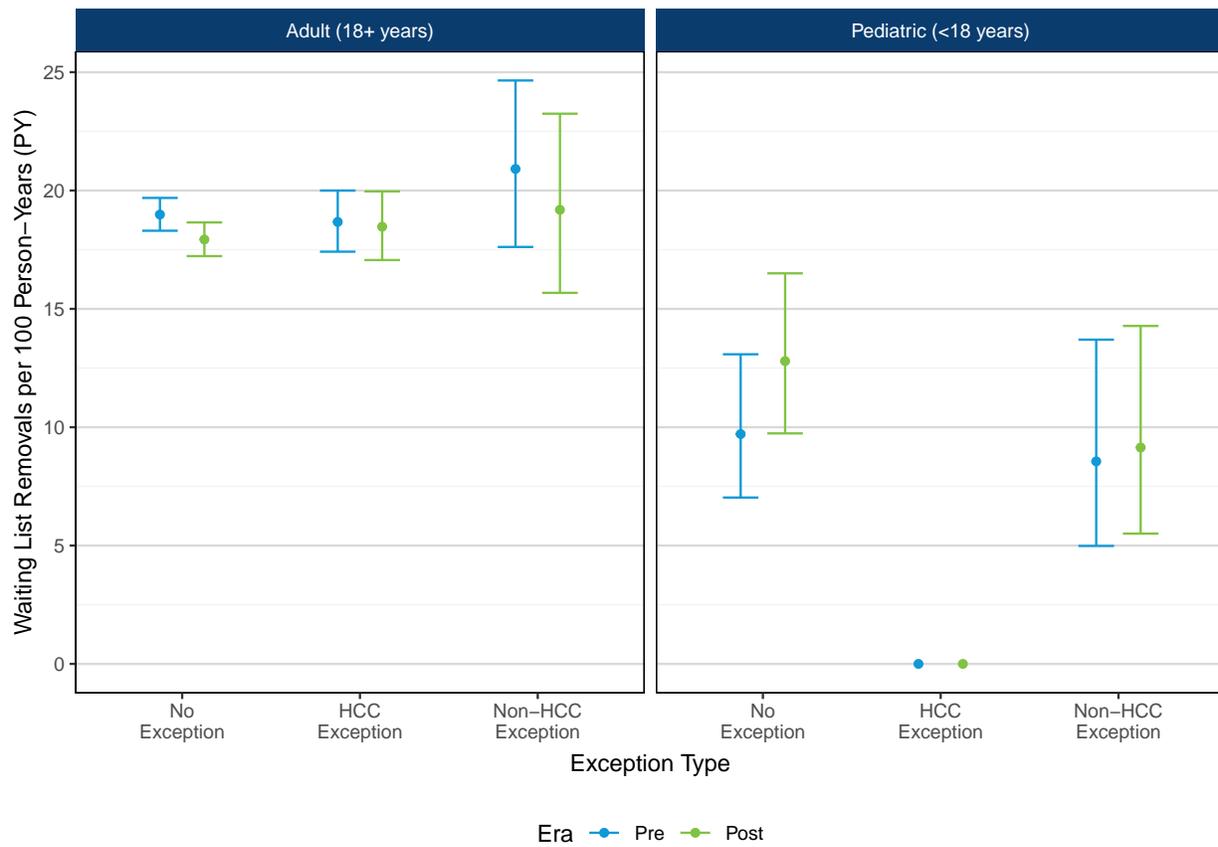
Appendix Table 1. Liver-Along Waiting List Deaths or Removals for Too Sick Per 100 Person-Years Waiting by OPTN Region, Exception Type, and Era

| OPTN Region | Exception Type | Era | Ever Waiting | Death/Too Sick Events | Person-Years | Removals per 100 PY | |
|-------------|-------------------|------|--------------|-----------------------|--------------|---------------------|----------------|
| | | | N | N | PY | Estimate | 95% CI |
| 1 | No Exception | Pre | 1728 | 234 | 1690.3 | 13.84 | (12.13, 15.74) |
| | | Post | 1639 | 166 | 1335.2 | 12.43 | (10.61, 14.47) |
| | HCC Exception | Pre | 365 | 56 | 350.4 | 15.98 | (12.07, 20.75) |
| | | Post | 328 | 44 | 254.3 | 17.30 | (12.57, 23.22) |
| | Non-HCC Exception | Pre | 77 | 14 | 64.1 | 21.84 | (11.94, 36.64) |
| | | Post | 106 | 9 | 65.4 | 13.77 | (6.30, 26.14) |
| 2 | No Exception | Pre | 3308 | 412 | 2314.1 | 17.80 | (16.13, 19.61) |
| | | Post | 3318 | 353 | 2033.3 | 17.36 | (15.60, 19.27) |
| | HCC Exception | Pre | 688 | 106 | 503.3 | 21.06 | (17.24, 25.47) |
| | | Post | 642 | 99 | 435.4 | 22.74 | (18.48, 27.68) |
| | Non-HCC Exception | Pre | 199 | 15 | 97.2 | 15.42 | (8.63, 25.44) |
| | | Post | 200 | 16 | 104.8 | 15.26 | (8.72, 24.79) |
| 3 | No Exception | Pre | 3420 | 333 | 1479.0 | 22.51 | (20.16, 25.07) |
| | | Post | 3669 | 254 | 1421.5 | 17.87 | (15.74, 20.21) |
| | HCC Exception | Pre | 669 | 66 | 392.6 | 16.81 | (13.00, 21.39) |
| | | Post | 585 | 44 | 314.1 | 14.01 | (10.18, 18.81) |
| | Non-HCC Exception | Pre | 187 | 15 | 79.9 | 18.78 | (10.51, 30.98) |
| | | Post | 184 | 22 | 80.8 | 27.23 | (17.07, 41.23) |
| 4 | No Exception | Pre | 3121 | 428 | 1833.6 | 23.34 | (21.18, 25.66) |
| | | Post | 3371 | 378 | 1873.0 | 20.18 | (18.20, 22.32) |
| | HCC Exception | Pre | 736 | 125 | 557.5 | 22.42 | (18.66, 26.71) |
| | | Post | 754 | 123 | 563.2 | 21.84 | (18.15, 26.06) |
| | Non-HCC Exception | Pre | 191 | 28 | 104.8 | 26.72 | (17.75, 38.62) |
| | | Post | 194 | 18 | 105.5 | 17.06 | (10.11, 26.96) |
| 5 | No Exception | Pre | 4629 | 487 | 3304.6 | 14.74 | (13.46, 16.11) |
| | | Post | 4709 | 457 | 2762.7 | 16.54 | (15.06, 18.13) |
| | HCC Exception | Pre | 1325 | 186 | 1104.7 | 16.84 | (14.50, 19.44) |
| | | Post | 1246 | 137 | 925.0 | 14.81 | (12.43, 17.51) |
| | Non-HCC Exception | Pre | 336 | 32 | 207.8 | 15.40 | (10.53, 21.74) |
| | | Post | 375 | 28 | 175.1 | 15.99 | (10.63, 23.12) |
| 6 | No Exception | Pre | 732 | 81 | 395.9 | 20.46 | (16.25, 25.43) |
| | | Post | 811 | 64 | 380.4 | 16.82 | (12.96, 21.48) |
| | | Pre | 208 | 30 | 136.9 | 21.92 | (14.79, 31.29) |

(continued)

| OPTN Region | Exception Type | Era | N | N | PY | Estimate | 95% CI |
|-------------|-------------------|------|------|-----|--------|----------|----------------|
| 6 | HCC Exception | Post | 204 | 16 | 126.3 | 12.67 | (7.24, 20.57) |
| | | Pre | 81 | 6 | 45.6 | 13.16 | (4.83, 28.64) |
| | Non-HCC Exception | Post | 70 | 12 | 34.7 | 34.60 | (17.88, 60.43) |
| | | Pre | 1866 | 191 | 921.9 | 20.72 | (17.88, 23.87) |
| 7 | HCC Exception | Post | 1937 | 136 | 730.9 | 18.61 | (15.61, 22.01) |
| | | Pre | 471 | 59 | 295.1 | 19.99 | (15.22, 25.79) |
| | Non-HCC Exception | Post | 434 | 41 | 242.4 | 16.91 | (12.14, 22.95) |
| | | Pre | 182 | 10 | 81.2 | 12.32 | (5.91, 22.66) |
| 8 | HCC Exception | Post | 217 | 15 | 89.4 | 16.77 | (9.39, 27.66) |
| | | Pre | 1529 | 149 | 726.0 | 20.52 | (17.36, 24.10) |
| | Non-HCC Exception | Post | 1579 | 158 | 709.9 | 22.26 | (18.92, 26.01) |
| | | Pre | 301 | 39 | 206.4 | 18.90 | (13.44, 25.83) |
| 9 | HCC Exception | Post | 348 | 36 | 228.9 | 15.72 | (11.01, 21.77) |
| | | Pre | 107 | 8 | 44.1 | 18.15 | (7.84, 35.77) |
| | Non-HCC Exception | Post | 137 | 4 | 49.6 | 8.06 | (2.20, 20.64) |
| | | Pre | 1872 | 183 | 995.1 | 18.39 | (15.82, 21.26) |
| 10 | HCC Exception | Post | 1792 | 146 | 745.5 | 19.58 | (16.54, 23.03) |
| | | Pre | 464 | 54 | 354.0 | 15.25 | (11.46, 19.90) |
| | Non-HCC Exception | Post | 422 | 52 | 267.0 | 19.47 | (14.54, 25.54) |
| | | Pre | 124 | 13 | 61.2 | 21.22 | (11.30, 36.29) |
| 11 | HCC Exception | Post | 138 | 7 | 49.5 | 14.13 | (5.68, 29.11) |
| | | Pre | 2326 | 202 | 1155.8 | 17.48 | (15.15, 20.06) |
| | Non-HCC Exception | Post | 2407 | 159 | 860.7 | 18.47 | (15.71, 21.58) |
| | | Pre | 345 | 40 | 200.3 | 19.97 | (14.27, 27.19) |
| 11 | HCC Exception | Post | 324 | 27 | 157.1 | 17.19 | (11.33, 25.01) |
| | | Pre | 124 | 9 | 43.6 | 20.65 | (9.44, 39.20) |
| | Non-HCC Exception | Post | 139 | 4 | 35.5 | 11.27 | (3.07, 28.85) |
| | | Pre | 2295 | 262 | 1030.9 | 25.42 | (22.43, 28.69) |
| 11 | HCC Exception | Post | 2399 | 202 | 1009.7 | 20.01 | (17.34, 22.96) |
| | | Pre | 452 | 58 | 295.9 | 19.60 | (14.88, 25.34) |
| | Non-HCC Exception | Post | 493 | 56 | 291.8 | 19.19 | (14.49, 24.92) |
| | | Pre | 121 | 9 | 52.0 | 17.30 | (7.91, 32.84) |
| 11 | Non-HCC Exception | Post | 153 | 12 | 57.2 | 20.99 | (10.85, 36.67) |

Appendix Figure 3. Liver-Along Waiting List Deaths or Removals for Too Sick Per 100 Person-Years Waiting by Age, Exception Type, and Era



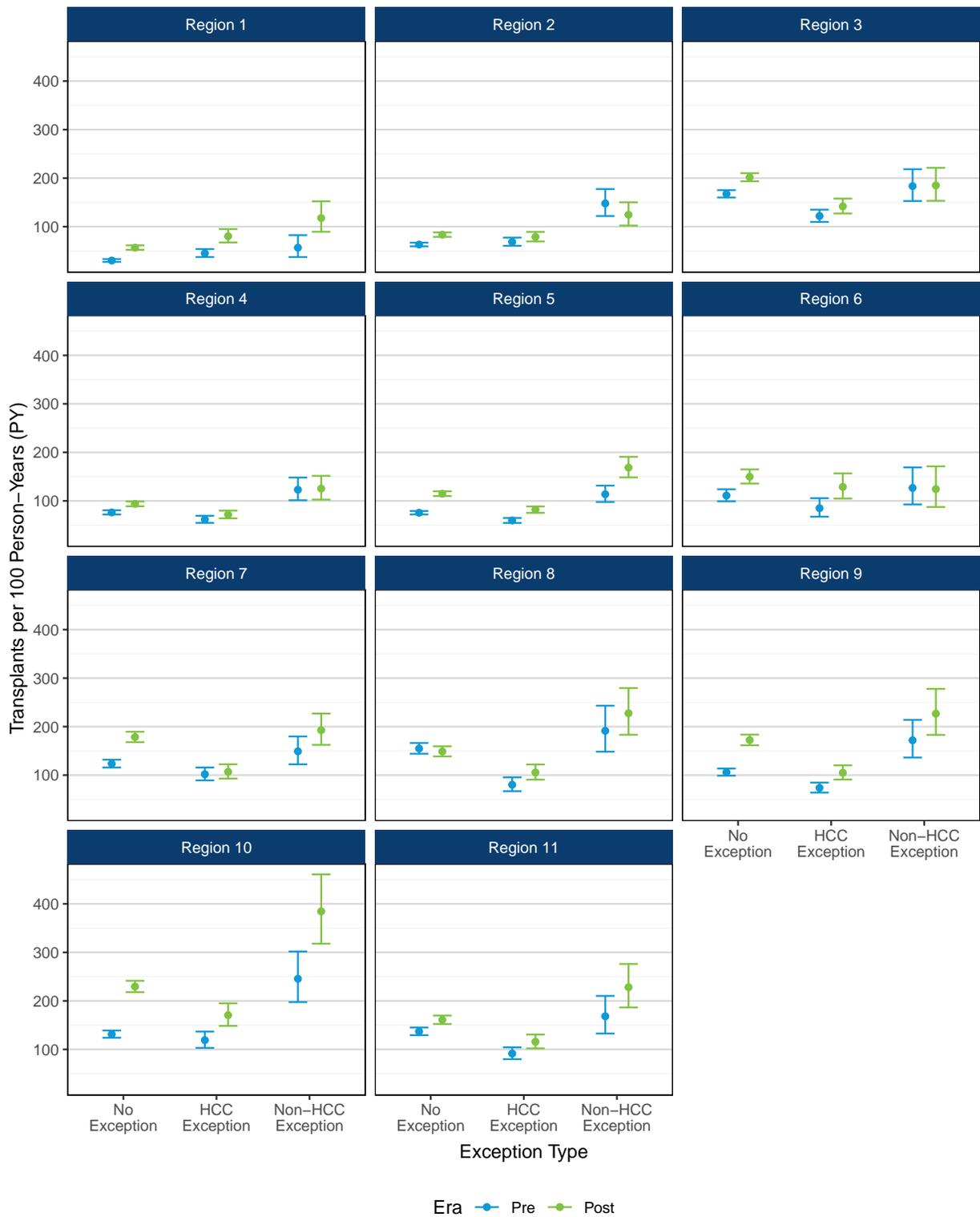
Small sample size and the absence of any Death/Too Sick events occurring for pediatric HCC exception candidates during the study period precludes estimation of confidence intervals for these candidates.

Appendix Table 2. Liver-Along Waiting List Deaths or Removals for Too Sick Per 100 Person-Years Waiting by Age, Exception Type, and Era

| Recipient Age | Exception Type | Era | Ever Waiting | Death/Too Sick Events | Person-Years | Removals per 100 PY | | |
|-------------------|-----------------------|--------------|--------------|-----------------------|--------------|---------------------|----------------|---------------|
| | | | N | N | PY | Estimate | 95% CI | |
| Adult (18+ years) | No Exception | Pre | 25575 | 2906 | 15307.0 | 18.98 | (18.30, 19.69) | |
| | | Post | 27868 | 2469 | 13770.3 | 17.93 | (17.23, 18.65) | |
| | HCC Exception | Pre | 5967 | 818 | 4380.5 | 18.67 | (17.42, 20.00) | |
| | | Post | 4570 | 636 | 3443.3 | 18.47 | (17.06, 19.96) | |
| | Non-HCC Exception | Pre | 1153 | 142 | 679.0 | 20.91 | (17.62, 24.65) | |
| | | Post | 948 | 104 | 542.1 | 19.19 | (15.68, 23.25) | |
| | Pediatric (<18 years) | No Exception | Pre | 985 | 43 | 442.8 | 9.71 | (7.03, 13.08) |
| | | | Post | 1122 | 59 | 461.2 | 12.79 | (9.74, 16.50) |
| HCC Exception | | Pre | 8 | 0 | 2.5 | 0.00 | (0.00, 0.00) | |
| | | Post | 5 | 0 | 0.8 | 0.00 | (0.00, 0.00) | |
| Non-HCC Exception | | Pre | 560 | 17 | 198.7 | 8.56 | (4.98, 13.70) | |
| | | Post | 469 | 19 | 207.8 | 9.14 | (5.50, 14.28) | |

Note. Small sample size and the absence of any Death/Too Sick events occurring for pediatric HCC exception candidates during the study period precludes estimation of confidence intervals for these candidates.

Appendix Figure 4. Liver-Alone Transplant Rates Per 100 Active Person-Years Waiting by OPTN Region, Exception Type, and Era



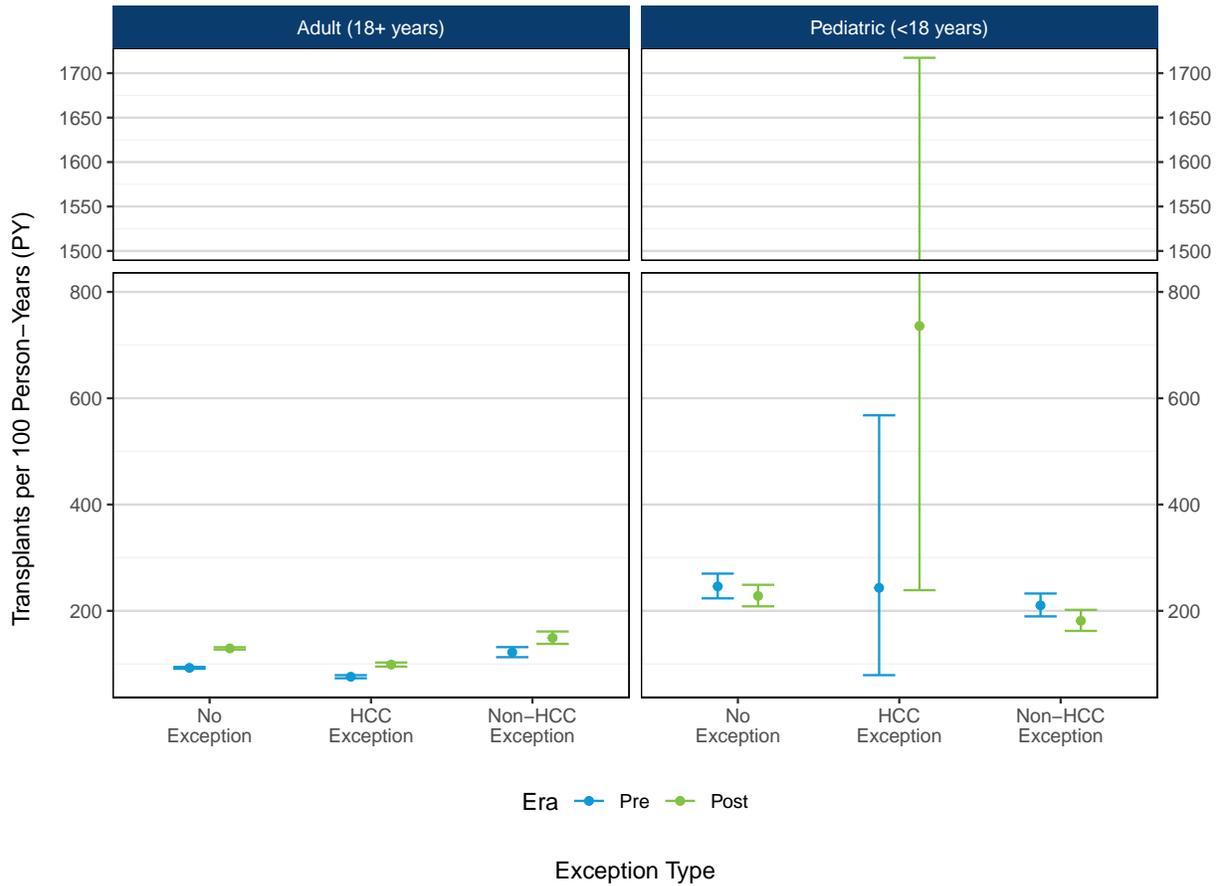
Appendix Table 3. Liver-Along Transplant Rates Per 100 Active Person-Years Waiting by OPTN Region, Exception Type, and Era

| OPTN Region | Exception Type | Era | Ever Waiting | Transplant Events | Active Person-Years | Transplants per 100 Active PY | |
|--------------|-------------------|------|--------------|-------------------|---------------------|-------------------------------|------------------|
| | | | N | N | PY | Estimate | 95% CI |
| 1 | No Exception | Pre | 1615 | 429 | 1423.1 | 30.15 | (27.36, 33.14) |
| | | Post | 1517 | 579 | 1021.2 | 56.70 | (52.18, 61.51) |
| | HCC Exception | Pre | 346 | 121 | 268.6 | 45.06 | (37.39, 53.84) |
| | | Post | 302 | 137 | 170.6 | 80.32 | (67.43, 94.95) |
| | Non-HCC Exception | Pre | 74 | 27 | 47.6 | 56.69 | (37.36, 82.49) |
| | | Post | 102 | 58 | 49.2 | 117.77 | (89.43, 152.25) |
| 2 | No Exception | Pre | 3103 | 1124 | 1779.7 | 63.16 | (59.52, 66.96) |
| | | Post | 3048 | 1289 | 1544.3 | 83.47 | (78.98, 88.15) |
| | HCC Exception | Pre | 647 | 263 | 383.2 | 68.64 | (60.60, 77.46) |
| | | Post | 594 | 255 | 323.1 | 78.92 | (69.53, 89.22) |
| | Non-HCC Exception | Pre | 194 | 114 | 77.1 | 147.78 | (121.90, 177.53) |
| | | Post | 196 | 109 | 87.6 | 124.50 | (102.23, 150.18) |
| 3 | No Exception | Pre | 3251 | 1898 | 1133.4 | 167.47 | (160.02, 175.17) |
| | | Post | 3542 | 2254 | 1116.9 | 201.81 | (193.57, 210.32) |
| | HCC Exception | Pre | 641 | 369 | 302.7 | 121.92 | (109.79, 135.01) |
| | | Post | 565 | 336 | 236.9 | 141.86 | (127.09, 157.87) |
| | Non-HCC Exception | Pre | 185 | 126 | 68.7 | 183.51 | (152.87, 218.49) |
| | | Post | 179 | 119 | 64.3 | 184.94 | (153.21, 221.31) |
| 4 | No Exception | Pre | 2985 | 1191 | 1561.8 | 76.26 | (71.99, 80.72) |
| | | Post | 3240 | 1446 | 1540.7 | 93.85 | (89.08, 98.82) |
| | HCC Exception | Pre | 717 | 281 | 455.2 | 61.73 | (54.73, 69.39) |
| | | Post | 739 | 322 | 449.2 | 71.69 | (64.07, 79.96) |
| | Non-HCC Exception | Pre | 189 | 112 | 91.0 | 123.07 | (101.34, 148.09) |
| | | Post | 190 | 106 | 84.5 | 125.38 | (102.65, 151.64) |
| 5 | No Exception | Pre | 4034 | 1710 | 2262.8 | 75.57 | (72.03, 79.24) |
| | | Post | 4233 | 2169 | 1889.8 | 114.77 | (109.99, 119.71) |
| | HCC Exception | Pre | 1290 | 534 | 896.3 | 59.58 | (54.63, 64.85) |
| | | Post | 1194 | 600 | 734.0 | 81.75 | (75.33, 88.56) |
| | Non-HCC Exception | Pre | 327 | 181 | 159.2 | 113.70 | (97.74, 131.53) |
| | | Post | 365 | 251 | 148.8 | 168.67 | (148.45, 190.88) |
| 6 | No Exception | Pre | 660 | 318 | 286.4 | 111.03 | (99.16, 123.93) |
| | | Post | 757 | 414 | 276.3 | 149.81 | (135.73, 164.96) |
| | HCC Exception | Pre | 192 | 81 | 95.3 | 84.97 | (67.48, 105.61) |
| | | Post | 185 | 100 | 77.6 | 128.83 | (104.82, 156.69) |
| | Non-HCC Exception | Pre | 81 | 46 | 36.3 | 126.68 | (92.74, 168.97) |
| | | Post | 70 | 37 | 29.8 | 124.28 | (87.50, 171.30) |
| No Exception | Pre | 1775 | 926 | 748.9 | 123.64 | (115.80, 131.87) | |
| | Post | 1860 | 1071 | 600.0 | 178.50 | (167.97, 189.52) | |
| No Exception | Pre | 452 | 234 | 229.7 | 101.86 | (89.22, 115.78) | |

(continued)

| OPTN Region | Exception Type | Era | N | N | PY | Estimate | 95% CI |
|-------------|-------------------|------|------|------|-------|----------|------------------|
| 7 | HCC Exception | Post | 415 | 209 | 195.5 | 106.91 | (92.91, 122.43) |
| | | Pre | 180 | 109 | 73.1 | 149.08 | (122.41, 179.83) |
| | Non-HCC Exception | Post | 214 | 143 | 74.2 | 192.62 | (162.35, 226.91) |
| | | Pre | 1406 | 764 | 493.3 | 154.87 | (144.09, 166.26) |
| | No Exception | Post | 1508 | 805 | 541.1 | 148.78 | (138.67, 159.42) |
| | | Pre | 286 | 128 | 159.5 | 80.27 | (66.96, 95.44) |
| 8 | HCC Exception | Post | 333 | 181 | 171.5 | 105.51 | (90.70, 122.06) |
| | | Pre | 106 | 67 | 35.0 | 191.40 | (148.33, 243.07) |
| | Non-HCC Exception | Post | 135 | 91 | 40.0 | 227.61 | (183.26, 279.45) |
| | | Pre | 1660 | 812 | 765.8 | 106.04 | (98.87, 113.59) |
| | No Exception | Post | 1709 | 961 | 557.8 | 172.28 | (161.56, 183.53) |
| | | Pre | 446 | 204 | 276.4 | 73.82 | (64.03, 84.67) |
| 9 | HCC Exception | Post | 407 | 205 | 195.6 | 104.83 | (90.97, 120.20) |
| | | Pre | 120 | 80 | 46.6 | 171.83 | (136.25, 213.85) |
| | Non-HCC Exception | Post | 136 | 93 | 41.0 | 226.74 | (183.01, 277.77) |
| | | Pre | 2213 | 1196 | 911.1 | 131.27 | (123.93, 138.92) |
| | No Exception | Post | 2303 | 1506 | 656.1 | 229.53 | (218.08, 241.42) |
| | | Pre | 342 | 201 | 168.8 | 119.04 | (103.15, 136.68) |
| 10 | HCC Exception | Post | 313 | 213 | 124.9 | 170.56 | (148.42, 195.07) |
| | | Pre | 122 | 90 | 36.6 | 245.57 | (197.47, 301.85) |
| | Non-HCC Exception | Post | 138 | 117 | 30.4 | 384.49 | (317.98, 460.80) |
| | | Pre | 2202 | 1177 | 859.1 | 137.01 | (129.29, 145.07) |
| | No Exception | Post | 2337 | 1359 | 844.9 | 160.84 | (152.41, 169.63) |
| | | Pre | 436 | 224 | 245.0 | 91.42 | (79.84, 104.21) |
| 11 | HCC Exception | Post | 472 | 261 | 225.5 | 115.73 | (102.11, 130.65) |
| | | Pre | 121 | 77 | 45.8 | 168.21 | (132.75, 210.24) |
| | Non-HCC Exception | Post | 152 | 105 | 46.0 | 228.11 | (186.57, 276.14) |
| | | Pre | | | | | |

Appendix Figure 5. Liver-Alone Transplant Rates Per 100 Active Person-Years Waiting by Age, Exception Type, and Era



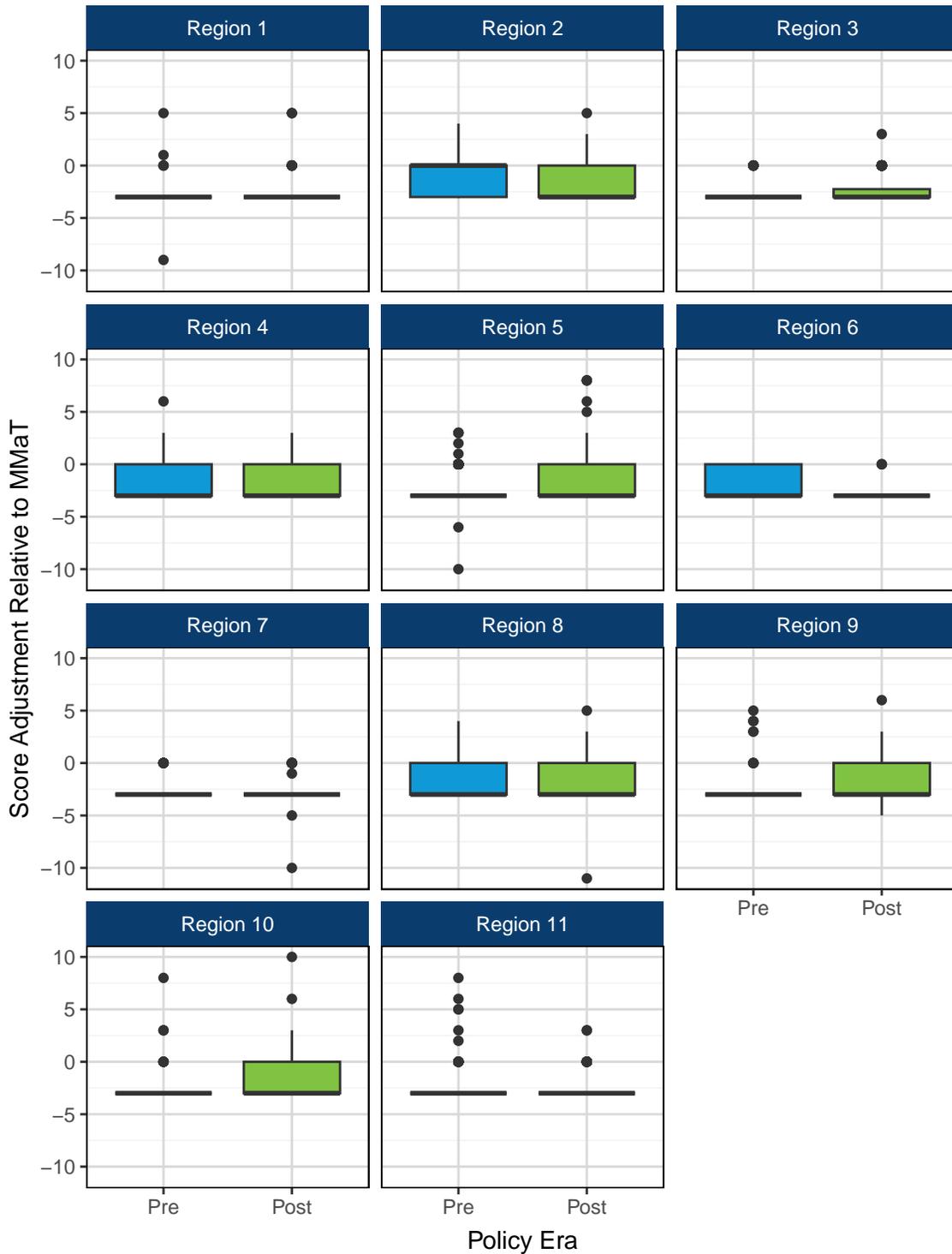
policy eras, respectively, thus making the confidence intervals very wide; please note the break in the y-axis enabling closer inspection of the remaining categories.

Appendix Table 4. Liver-Along Transplant Rates Per 100 Active Person-Years Waiting by Age, Exception Type, and Era

| Recipient Age | Exception Type | Era | Ever Waiting | Transplant Events | Active Person-Years | Transplants per 100 Active PY | | |
|-------------------|-----------------------|--------------|--------------|-------------------|---------------------|-------------------------------|-------------------|------------------|
| | | | N | N | PY | Estimate | 95% CI | |
| Adult (18+ years) | No Exception | Pre | 23835 | 11105 | 11977.4 | 92.72 | (91.00, 94.46) | |
| | | Post | 26369 | 13807 | 10677.0 | 129.32 | (127.17, 131.49) | |
| | HCC Exception | Pre | 5740 | 2635 | 3466.6 | 76.01 | (73.14, 78.97) | |
| | | Post | 4393 | 2582 | 2611.3 | 98.88 | (95.10, 102.77) | |
| | Non-HCC Exception | Pre | 1123 | 652 | 534.4 | 122.01 | (112.83, 131.75) | |
| | | Post | 920 | 641 | 429.8 | 149.15 | (137.83, 161.16) | |
| | Pediatric (<18 years) | No Exception | Pre | 837 | 440 | 178.9 | 245.93 | (223.49, 270.02) |
| | | | Post | 979 | 500 | 219.3 | 228.04 | (208.48, 248.93) |
| HCC Exception | | Pre | 8 | 5 | 2.1 | 243.33 | (79.01, 567.86) | |
| | | Post | 5 | 5 | 0.7 | 735.89 | (238.94, 1717.32) | |
| Non-HCC Exception | | Pre | 560 | 377 | 179.3 | 210.27 | (189.58, 232.61) | |
| | | Post | 469 | 331 | 182.6 | 181.29 | (162.29, 201.91) | |

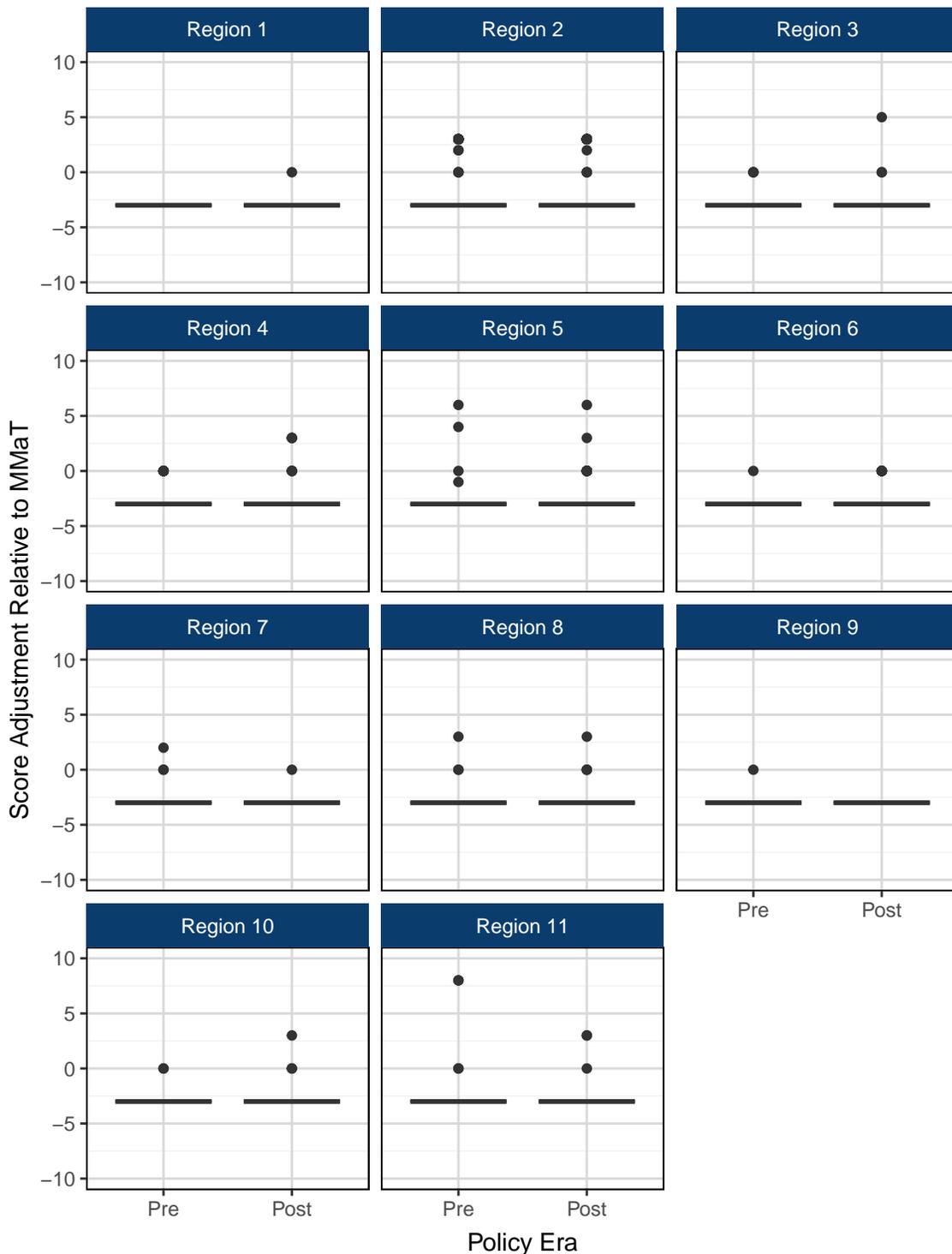
Exception Requests

Appendix Figure 6. Distribution of Score Adjustment Requested for Standard Initial MELD or PELD Exception Requests by OPTN Region and Era



Initial and first extension HCC requests were excluded, since the policy-assigned score in these cases equals candidates' calculated MELD

Appendix Figure 7. Distribution of Score Adjustment Requested for Standard Extension MELD or PELD Exception Requests by OPTN Region and Era



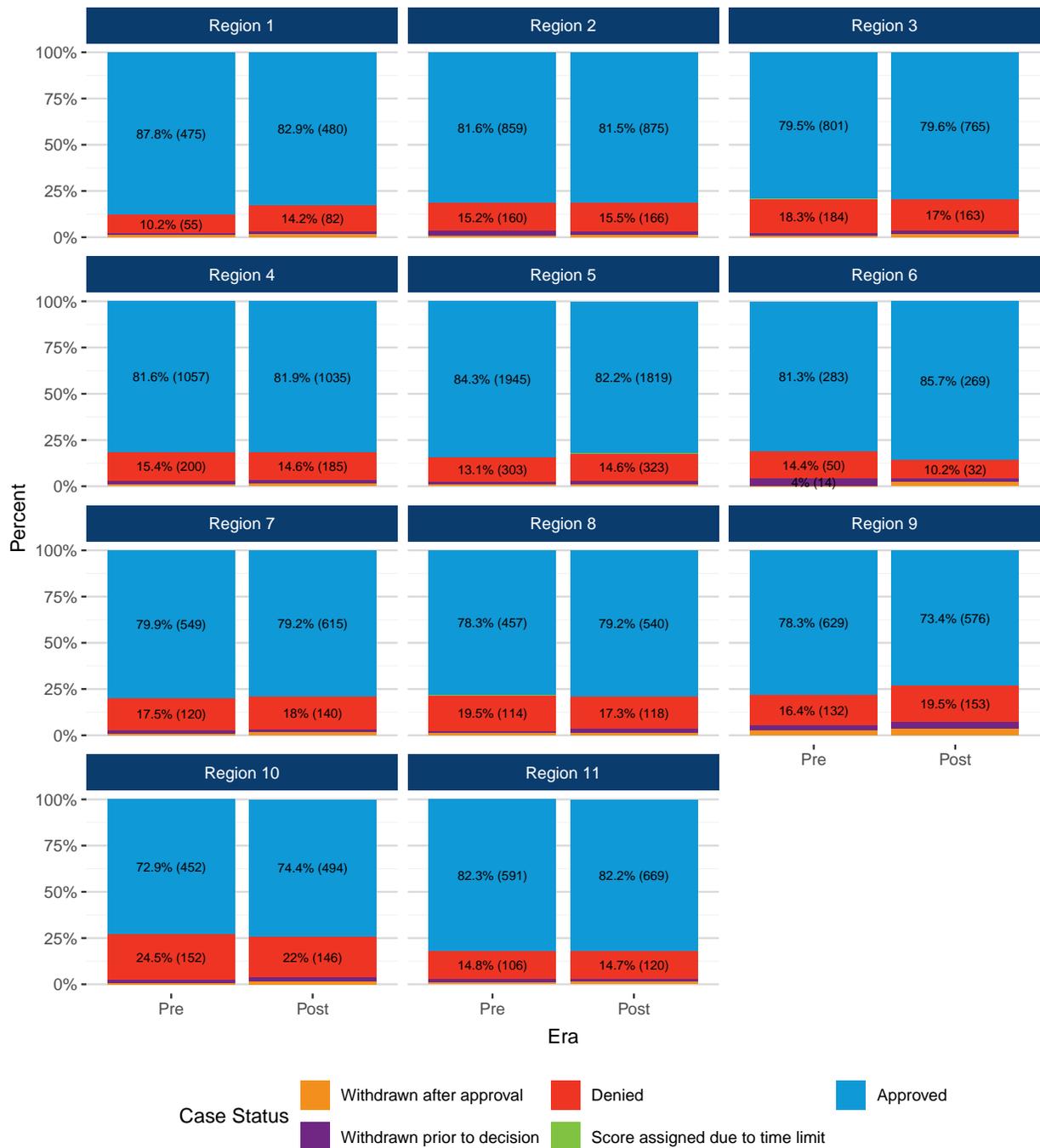
Initial and first extension HCC requests were excluded, since the policy-assigned score in these cases equals candidates' calculated MELD

Appendix Table 5. Distribution of Score Adjustment Requested for Standard Initial and Extension MELD or PELD Exception Requests by OPTN Region and Era

| Era | Application Type | OPTN Region | Minimum | 25th Percentile | Median | 75th Percentile | Maximum | Interquartile Range | Total Number of Forms |
|---------|------------------|-------------|---------|-----------------|--------|-----------------|---------|---------------------|-----------------------|
| Initial | | 1 | -9 | -3 | -3 | -3.00 | 5 | 0.00 | 31 |
| | | 2 | -3 | -3 | 0 | 0.00 | 4 | 3.00 | 71 |
| | | 3 | -3 | -3 | -3 | -3.00 | 0 | 0.00 | 79 |
| | | 4 | -3 | -3 | -3 | 0.00 | 6 | 3.00 | 76 |
| | | 5 | -10 | -3 | -3 | -3.00 | 3 | 0.00 | 150 |
| | | 6 | -3 | -3 | -3 | 0.00 | 0 | 3.00 | 30 |
| | | 7 | -3 | -3 | -3 | -3.00 | 0 | 0.00 | 81 |
| | | 8 | -3 | -3 | -3 | 0.00 | 4 | 3.00 | 41 |
| | | 9 | -3 | -3 | -3 | -3.00 | 5 | 0.00 | 45 |
| | | 10 | -3 | -3 | -3 | -3.00 | 8 | 0.00 | 56 |
| | | 11 | -3 | -3 | -3 | -3.00 | 8 | 0.00 | 73 |
| Pre | | 1 | -3 | -3 | -3 | -3.00 | -3 | 0.00 | 524 |
| | | 2 | -3 | -3 | -3 | -3.00 | 3 | 0.00 | 722 |
| | | 3 | -3 | -3 | -3 | -3.00 | 0 | 0.00 | 500 |
| | | 4 | -3 | -3 | -3 | -3.00 | 0 | 0.00 | 771 |
| | | 5 | -3 | -3 | -3 | -3.00 | 6 | 0.00 | 1453 |
| | | 6 | -3 | -3 | -3 | -3.00 | 0 | 0.00 | 199 |
| | | 7 | -3 | -3 | -3 | -3.00 | 2 | 0.00 | 551 |
| | | 8 | -3 | -3 | -3 | -3.00 | 3 | 0.00 | 234 |
| | | 9 | -3 | -3 | -3 | -3.00 | 0 | 0.00 | 524 |
| | | 10 | -3 | -3 | -3 | -3.00 | 0 | 0.00 | 305 |
| | | 11 | -3 | -3 | -3 | -3.00 | 8 | 0.00 | 433 |
| Initial | | 1 | -3 | -3 | -3 | -3.00 | 5 | 0.00 | 63 |
| | | 2 | -3 | -3 | -3 | 0.00 | 5 | 3.00 | 106 |
| | | 3 | -3 | -3 | -3 | -2.25 | 3 | 0.75 | 104 |
| | | 4 | -3 | -3 | -3 | 0.00 | 3 | 3.00 | 114 |
| | | 5 | -3 | -3 | -3 | 0.00 | 8 | 3.00 | 168 |
| | | 6 | -3 | -3 | -3 | -3.00 | 0 | 0.00 | 22 |
| | | 7 | -10 | -3 | -3 | -3.00 | 0 | 0.00 | 81 |
| | | 8 | -11 | -3 | -3 | 0.00 | 5 | 3.00 | 55 |
| | | 9 | -5 | -3 | -3 | 0.00 | 6 | 3.00 | 61 |
| | | 10 | -3 | -3 | -3 | 0.00 | 10 | 3.00 | 76 |
| | | 11 | -3 | -3 | -3 | -3.00 | 3 | 0.00 | 81 |
| Post | | 1 | -3 | -3 | -3 | -3.00 | 0 | 0.00 | 435 |
| | | 2 | -3 | -3 | -3 | -3.00 | 3 | 0.00 | 713 |
| | | 3 | -3 | -3 | -3 | -3.00 | 5 | 0.00 | 477 |
| | | 4 | -3 | -3 | -3 | -3.00 | 3 | 0.00 | 1030 |
| | | 5 | -3 | -3 | -3 | -3.00 | 6 | 0.00 | 1386 |
| | | 6 | -3 | -3 | -3 | -3.00 | 0 | 0.00 | 176 |
| | | 7 | -3 | -3 | -3 | -3.00 | 0 | 0.00 | 431 |
| | | 8 | -3 | -3 | -3 | -3.00 | 3 | 0.00 | 341 |
| | | 9 | -3 | -3 | -3 | -3.00 | -3 | 0.00 | 365 |
| | | 10 | -3 | -3 | -3 | -3.00 | 3 | 0.00 | 232 |
| | | 11 | -3 | -3 | -3 | -3.00 | 3 | 0.00 | 434 |

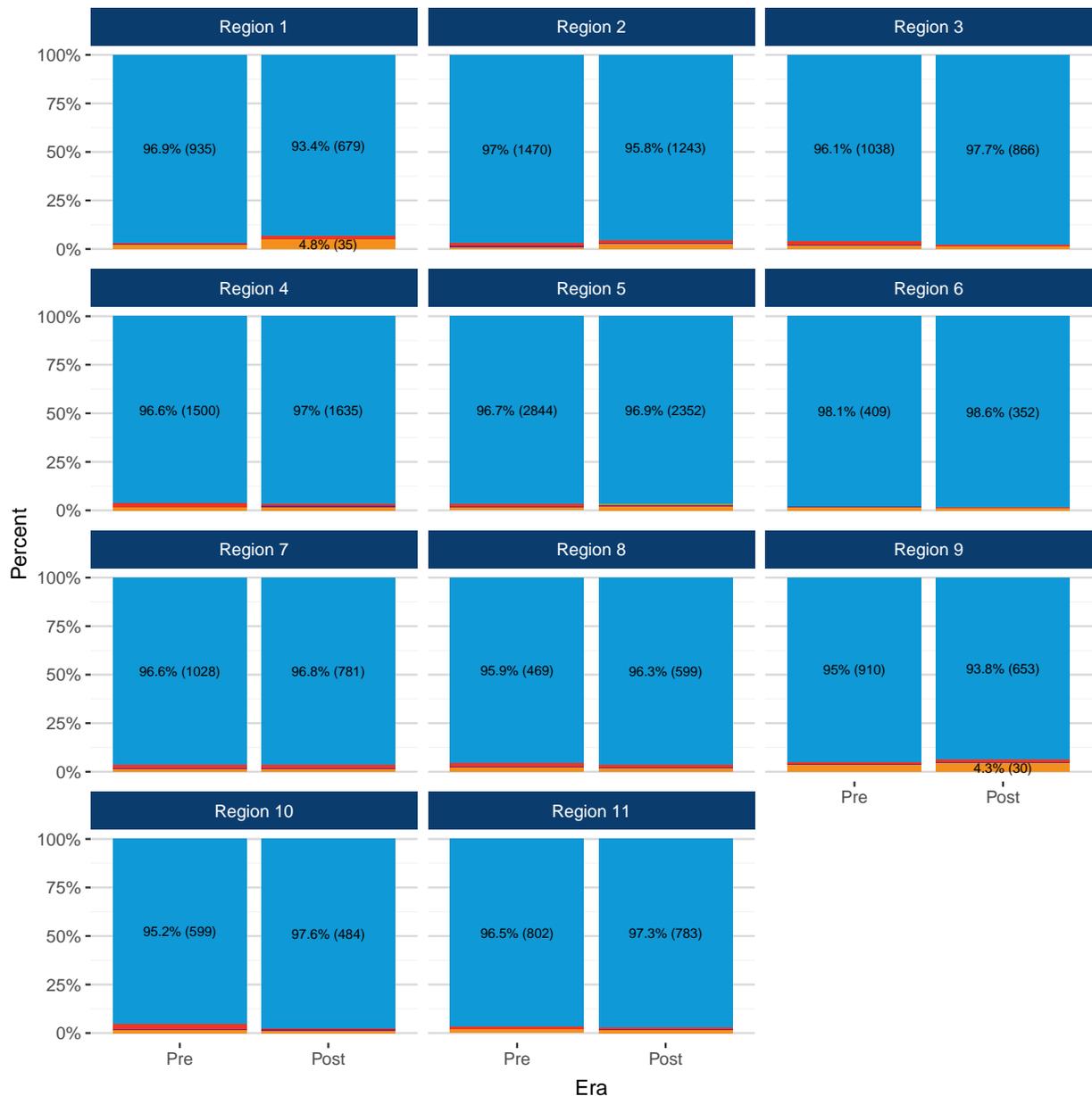
Initial and first extension HCC requests were excluded, since the policy-assigned score in these cases equals candidates' calculated MELD

Appendix Figure 8. Initial Request Forms Submitted by OPTN Region, Case Outcome, and Era



*Label is omitted for outcome categories containing <4% of forms.

Appendix Figure 9. Extension Request Forms Submitted by OPTN Region, Case Outcome, and Era



Case Status

- Withdrawn after approval
- Denied
- Approved
- Withdrawn prior to decision
- Score assigned due to time limit

*Label is omitted for outcome categories containing <4% of forms.

Appendix Table 6. Initial and Extension Request Forms Submitted by OPTN Region, Case Outcome, and Era

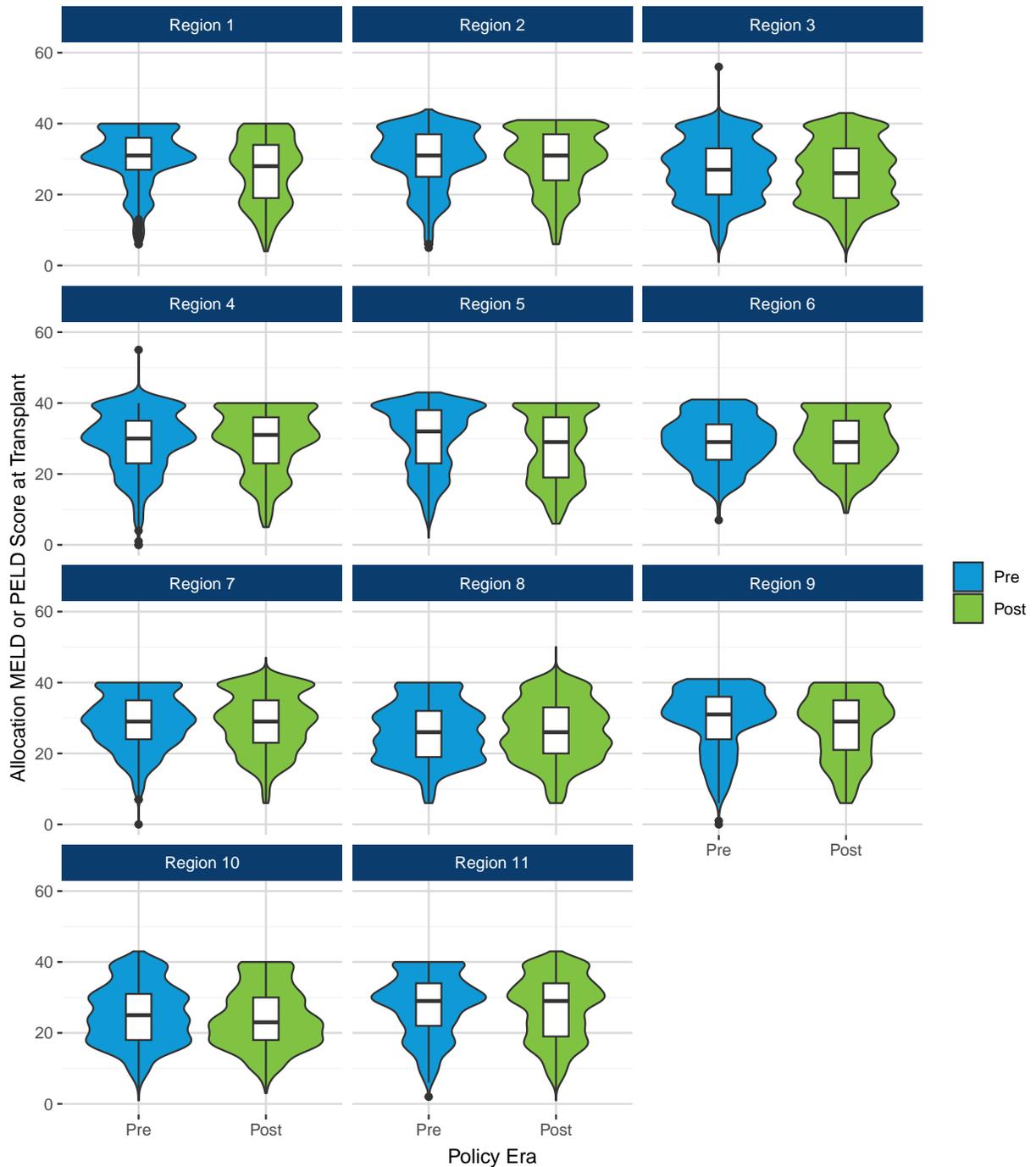
| OPTN Region | Application Type | Case Outcome | Pre-Policy | | Post-Policy | |
|-------------|------------------|----------------------------------|------------|-------|-------------|-------|
| | | | N | % | N | % |
| 1 | Initial | Approved | 475 | 87.8% | 480 | 82.9% |
| | | Denied | 55 | 10.2% | 82 | 14.2% |
| | | Withdrawn prior to decision | 6 | 1.1% | 8 | 1.4% |
| | | Withdrawn after approval | 5 | 0.9% | 9 | 1.6% |
| | Extension | Approved | 935 | 96.9% | 679 | 93.4% |
| | | Denied | 4 | 0.4% | 12 | 1.7% |
| | | Withdrawn prior to decision | 6 | 0.6% | 1 | 0.1% |
| | | Withdrawn after approval | 20 | 2.1% | 35 | 4.8% |
| | | Approved | 859 | 81.6% | 875 | 81.5% |
| | | Score assigned due to time limit | 0 | 0.0% | 1 | 0.1% |
| 2 | Initial | Denied | 160 | 15.2% | 166 | 15.5% |
| | | Withdrawn prior to decision | 26 | 2.5% | 18 | 1.7% |
| | | Withdrawn after approval | 8 | 0.8% | 14 | 1.3% |
| | | Approved | 1470 | 97% | 1243 | 95.8% |
| | Extension | Score assigned due to time limit | 1 | 0.1% | 0 | 0.0% |
| | | Denied | 24 | 1.6% | 19 | 1.5% |
| | | Withdrawn prior to decision | 8 | 0.5% | 6 | 0.5% |
| | | Withdrawn after approval | 13 | 0.9% | 30 | 2.3% |
| | | Approved | 801 | 79.5% | 765 | 79.6% |
| | | Score assigned due to time limit | 1 | 0.1% | 0 | 0.0% |
| 3 | Initial | Denied | 184 | 18.3% | 163 | 17% |
| | | Withdrawn prior to decision | 15 | 1.5% | 17 | 1.8% |
| | | Withdrawn after approval | 7 | 0.7% | 16 | 1.7% |
| | | Approved | 1038 | 96.1% | 866 | 97.7% |
| | Extension | Denied | 22 | 2% | 8 | 0.9% |
| | | Withdrawn prior to decision | 2 | 0.2% | 2 | 0.2% |
| | | Withdrawn after approval | 18 | 1.7% | 10 | 1.1% |
| | | Approved | 1057 | 81.6% | 1035 | 81.9% |
| | | Denied | 200 | 15.4% | 185 | 14.6% |
| | | Withdrawn prior to decision | 28 | 2.2% | 27 | 2.1% |
| 4 | Initial | Withdrawn after approval | 10 | 0.8% | 17 | 1.3% |
| | | Approved | 1500 | 96.6% | 1635 | 97% |
| | | Denied | 29 | 1.9% | 16 | 0.9% |
| | | Withdrawn prior to decision | 2 | 0.1% | 8 | 0.5% |
| | Extension | Withdrawn after approval | 22 | 1.4% | 27 | 1.6% |

| OPTN Region | Application Type | Case Outcome | Pre-Policy | | Post-Policy | |
|-------------|------------------|----------------------------------|------------|-------|-------------|-------|
| | | | N | % | N | % |
| 5 | Initial | Approved | 1945 | 84.3% | 1819 | 82.2% |
| | | Score assigned due to time limit | 1 | 0% | 3 | 0.1% |
| | | Denied | 303 | 13.1% | 323 | 14.6% |
| | | Withdrawn prior to decision | 39 | 1.7% | 48 | 2.2% |
| | | Withdrawn after approval | 18 | 0.8% | 19 | 0.9% |
| | Extension | Approved | 2844 | 96.7% | 2352 | 96.9% |
| | | Score assigned due to time limit | 0 | 0.0% | 1 | 0% |
| | | Denied | 43 | 1.5% | 18 | 0.7% |
| | | Withdrawn prior to decision | 16 | 0.5% | 4 | 0.2% |
| | | Withdrawn after approval | 39 | 1.3% | 51 | 2.1% |
| 6 | Initial | Approved | 283 | 81.3% | 269 | 85.7% |
| | | Denied | 50 | 14.4% | 32 | 10.2% |
| | | Withdrawn prior to decision | 14 | 4% | 6 | 1.9% |
| | | Withdrawn after approval | 1 | 0.3% | 7 | 2.2% |
| | Extension | Approved | 409 | 98.1% | 352 | 98.6% |
| | | Denied | 1 | 0.2% | 1 | 0.3% |
| | | Withdrawn prior to decision | 1 | 0.2% | 0 | 0.0% |
| | | Withdrawn after approval | 6 | 1.4% | 4 | 1.1% |
| 7 | Initial | Approved | 549 | 79.9% | 615 | 79.2% |
| | | Denied | 120 | 17.5% | 140 | 18% |
| | | Withdrawn prior to decision | 12 | 1.7% | 11 | 1.4% |
| | | Withdrawn after approval | 6 | 0.9% | 11 | 1.4% |
| | Extension | Approved | 1028 | 96.6% | 781 | 96.8% |
| | | Denied | 18 | 1.7% | 12 | 1.5% |
| | | Withdrawn prior to decision | 4 | 0.4% | 3 | 0.4% |
| | | Withdrawn after approval | 14 | 1.3% | 11 | 1.4% |
| 8 | Initial | Approved | 457 | 78.3% | 540 | 79.2% |
| | | Score assigned due to time limit | 1 | 0.2% | 0 | 0.0% |
| | | Denied | 114 | 19.5% | 118 | 17.3% |
| | | Withdrawn prior to decision | 5 | 0.9% | 16 | 2.3% |
| | | Withdrawn after approval | 7 | 1.2% | 8 | 1.2% |
| | Extension | Approved | 469 | 95.9% | 599 | 96.3% |
| | | Denied | 7 | 1.4% | 11 | 1.8% |
| | | Withdrawn prior to decision | 2 | 0.4% | 1 | 0.2% |
| | | Withdrawn after approval | 11 | 2.2% | 11 | 1.8% |

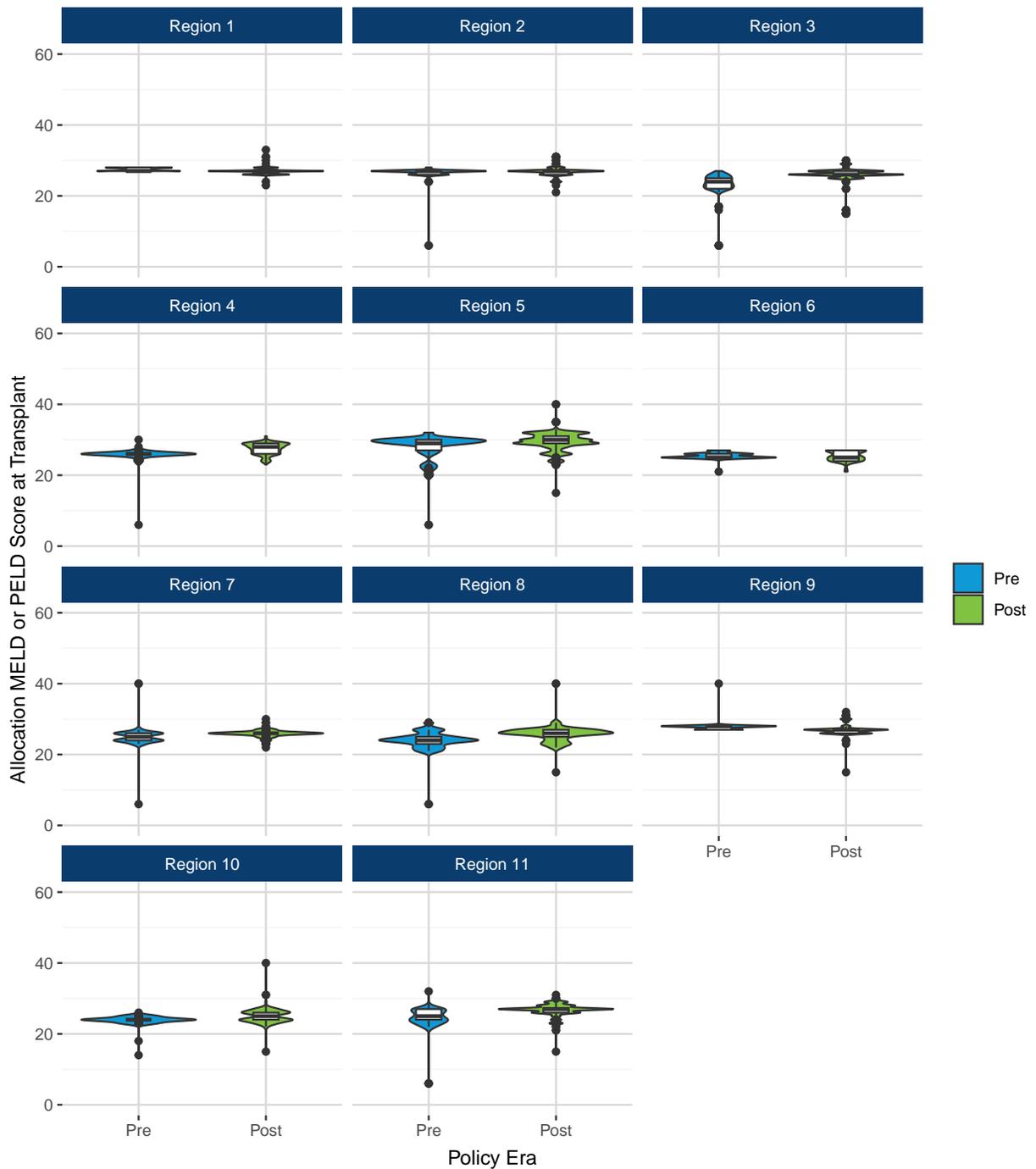
| OPTN Region | Application Type | Case Outcome | Pre-Policy | | Post-Policy | |
|-------------|------------------|----------------------------------|------------|-------|-------------|-------|
| | | | N | % | N | % |
| 9 | Initial | Approved | 629 | 78.3% | 576 | 73.4% |
| | | Denied | 132 | 16.4% | 153 | 19.5% |
| | | Withdrawn prior to decision | 23 | 2.9% | 28 | 3.6% |
| | | Withdrawn after approval | 19 | 2.4% | 28 | 3.6% |
| | Extension | Approved | 910 | 95% | 653 | 93.8% |
| | | Denied | 10 | 1% | 9 | 1.3% |
| | | Withdrawn prior to decision | 5 | 0.5% | 4 | 0.6% |
| | | Withdrawn after approval | 33 | 3.4% | 30 | 4.3% |
| 10 | Initial | Approved | 452 | 72.9% | 494 | 74.4% |
| | | Score assigned due to time limit | 1 | 0.2% | 0 | 0.0% |
| | | Denied | 152 | 24.5% | 146 | 22% |
| | | Withdrawn prior to decision | 11 | 1.8% | 14 | 2.1% |
| | Extension | Approved | 599 | 95.2% | 484 | 97.6% |
| | | Denied | 17 | 2.7% | 4 | 0.8% |
| | | Withdrawn prior to decision | 4 | 0.6% | 3 | 0.6% |
| | | Withdrawn after approval | 9 | 1.4% | 5 | 1% |
| 11 | Initial | Approved | 591 | 82.3% | 669 | 82.2% |
| | | Denied | 106 | 14.8% | 120 | 14.7% |
| | | Withdrawn prior to decision | 15 | 2.1% | 14 | 1.7% |
| | | Withdrawn after approval | 6 | 0.8% | 11 | 1.4% |
| | Extension | Approved | 802 | 96.5% | 783 | 97.3% |
| | | Denied | 11 | 1.3% | 9 | 1.1% |
| | | Withdrawn prior to decision | 3 | 0.4% | 1 | 0.1% |
| | | Withdrawn after approval | 15 | 1.8% | 12 | 1.5% |

Transplants

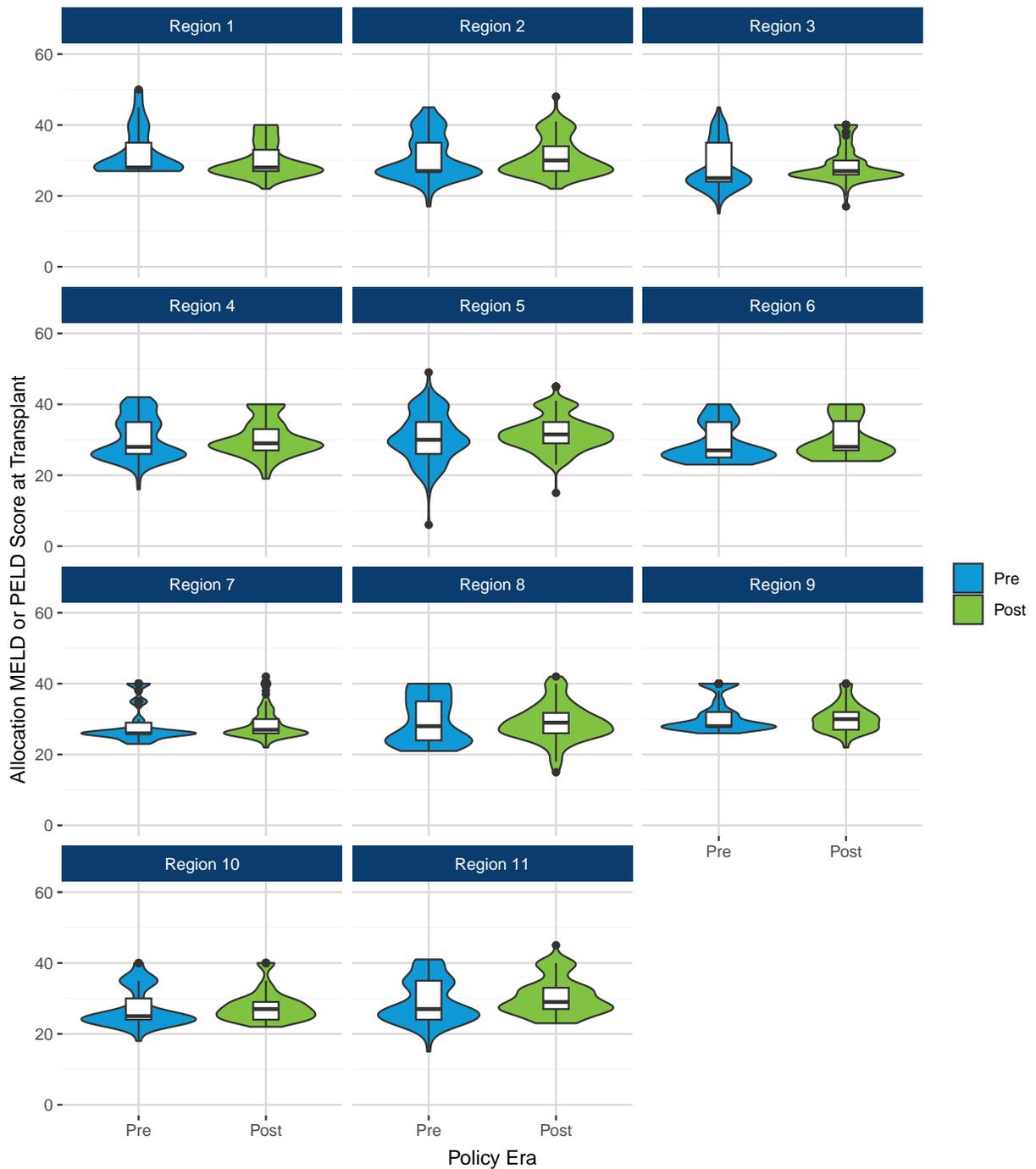
Appendix Figure 10. Distribution of Allocation MELD or PELD Score or Status at Transplant for Liver-Alone Transplant Recipients with No Exceptions by OPTN Region and Era



Appendix Figure 11. Distribution of Allocation MELD or PELD Score or Status at Transplant for Liver-Alone Transplant Recipients with HCC Exceptions by OPTN Region and Era



Appendix Figure 12. Distribution of Allocation MELD or PELD Score or Status at Transplant for Liver-Alone Transplant Recipients with Non-HCC Exceptions by OPTN Region and Era



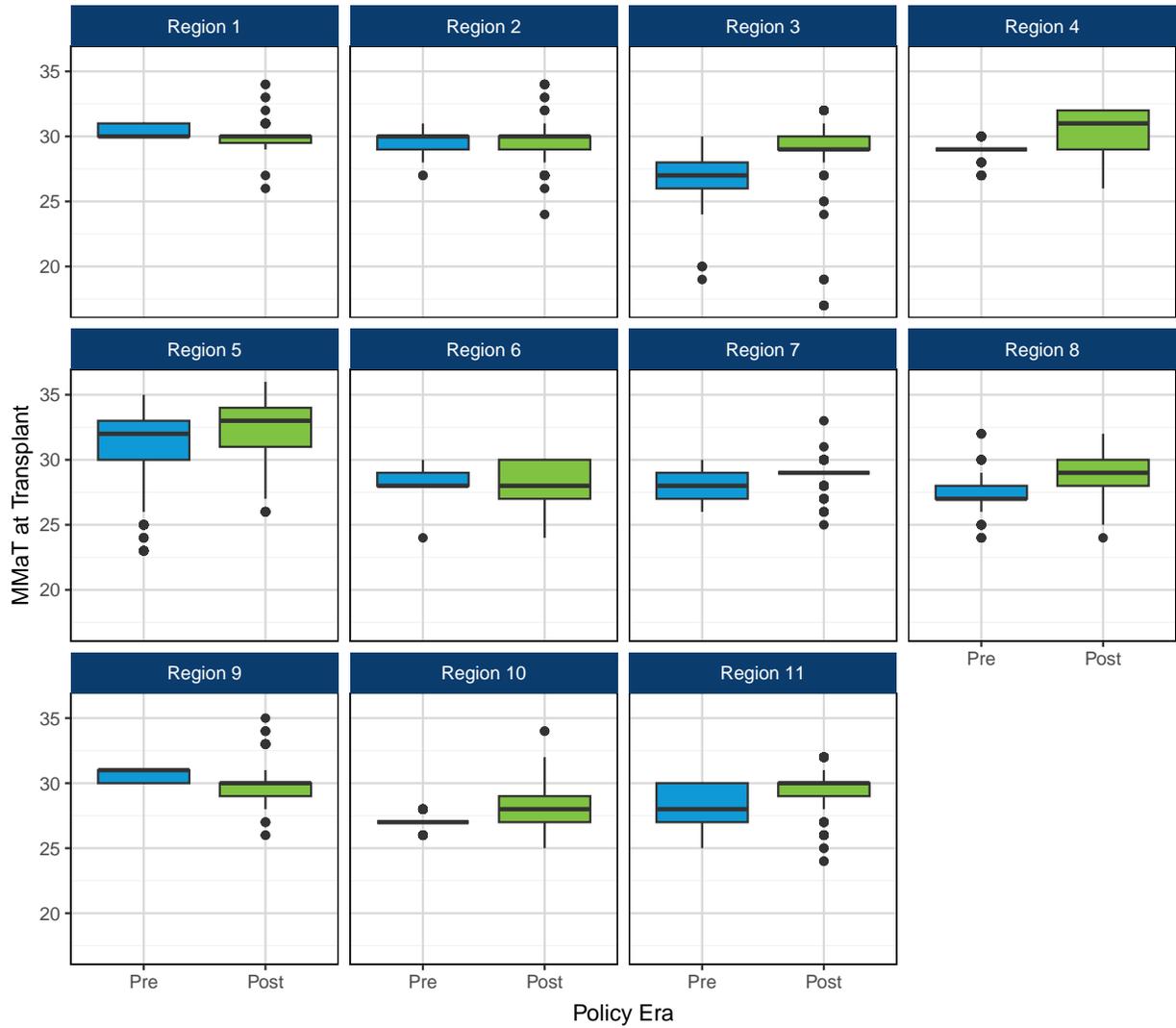
Appendix Table 7. Distribution of Allocation MELD or PELD Score at Transplant by Exception Type, OPTN Region, and Era

| Exception Type | OPTN Region | Policy Era | N | Minimum | 25th Percentile | Median | 75th Percentile | Maximum | Interquartile Range |
|----------------|-------------|------------|------|---------|-----------------|--------|-----------------|---------|---------------------|
| No Exception | 1 | Pre | 441 | -7 | 27.0 | 31.0 | 36.0 | 40 | 9.0 |
| | | Post | 605 | 4 | 19.0 | 28.0 | 34.0 | 40 | 15.0 |
| | 2 | Pre | 1144 | -9 | 25.0 | 31.0 | 37.0 | 44 | 12.0 |
| | | Post | 1280 | -6 | 24.0 | 31.0 | 37.0 | 41 | 13.0 |
| | 3 | Pre | 2042 | -3 | 20.0 | 27.0 | 33.0 | 56 | 13.0 |
| | | Post | 2342 | -9 | 19.0 | 26.0 | 33.0 | 43 | 14.0 |
| | 4 | Pre | 1240 | -9 | 23.0 | 30.0 | 35.0 | 55 | 12.0 |
| | | Post | 1518 | -4 | 23.0 | 31.0 | 36.0 | 40 | 13.0 |
| | 5 | Pre | 1820 | -10 | 23.0 | 32.0 | 38.0 | 43 | 15.0 |
| | | Post | 2299 | -10 | 19.0 | 29.0 | 36.0 | 40 | 17.0 |
| | 6 | Pre | 333 | 7 | 24.0 | 29.0 | 34.0 | 41 | 10.0 |
| | | Post | 426 | -5 | 23.0 | 29.0 | 35.0 | 40 | 12.0 |
| | 7 | Pre | 966 | -2 | 24.0 | 29.0 | 35.0 | 40 | 11.0 |
| | | Post | 1114 | -8 | 23.0 | 29.0 | 35.0 | 47 | 12.0 |
| | 8 | Pre | 783 | 6 | 19.0 | 26.0 | 32.0 | 40 | 13.0 |
| | | Post | 830 | -8 | 20.0 | 26.0 | 33.0 | 50 | 13.0 |
| | 9 | Pre | 838 | -11 | 23.0 | 31.0 | 36.0 | 41 | 13.0 |
| | | Post | 962 | 6 | 21.0 | 29.0 | 35.0 | 40 | 14.0 |
| | 10 | Pre | 989 | -3 | 18.0 | 25.0 | 31.0 | 43 | 13.0 |
| | | Post | 1316 | -5 | 18.0 | 23.0 | 30.0 | 40 | 12.0 |
| | 11 | Pre | 1473 | -9 | 22.0 | 29.0 | 34.0 | 40 | 12.0 |
| | | Post | 1699 | 1 | 19.0 | 29.0 | 34.0 | 43 | 15.0 |
| 1 | Pre | 97 | 27 | 27.0 | 27.0 | 28.0 | 28 | 1.0 | |
| | Post | 99 | 23 | 26.5 | 27.0 | 27.0 | 33 | 0.5 | |
| 2 | Pre | 198 | 6 | 26.0 | 27.0 | 27.0 | 28 | 1.0 | |
| | Post | 205 | 21 | 26.0 | 27.0 | 27.0 | 31 | 1.0 | |
| 3 | Pre | 220 | 6 | 22.0 | 24.0 | 25.0 | 27 | 3.0 | |
| | Post | 222 | 15 | 26.0 | 26.0 | 27.0 | 30 | 1.0 | |
| 4 | Pre | 203 | 6 | 26.0 | 26.0 | 26.0 | 30 | 0.0 | |
| | Post | 239 | 23 | 26.0 | 28.0 | 29.0 | 31 | 3.0 | |
| 5 | Pre | 395 | 6 | 27.0 | 29.0 | 30.0 | 32 | 3.0 | |
| | Post | 438 | 15 | 29.0 | 30.0 | 31.0 | 40 | 2.0 | |
| 6 | Pre | 64 | 21 | 25.0 | 25.0 | 26.0 | 27 | 1.0 | |
| | Post | 80 | 21 | 24.0 | 25.0 | 27.0 | 27 | 3.0 | |
| 7 | Pre | 172 | 6 | 24.0 | 25.0 | 26.0 | 40 | 2.0 | |
| | Post | 161 | 22 | 26.0 | 26.0 | 26.0 | 30 | 0.0 | |
| 8 | Pre | 80 | 6 | 23.0 | 24.0 | 25.0 | 29 | 2.0 | |
| | Post | 121 | 15 | 25.0 | 26.0 | 27.0 | 40 | 2.0 | |
| 9 | Pre | 146 | 27 | 27.0 | 28.0 | 28.0 | 40 | 1.0 | |
| | Post | 169 | 15 | 26.0 | 27.0 | 27.0 | 32 | 1.0 | |
| 10 | Pre | 127 | 14 | 24.0 | 24.0 | 24.0 | 26 | 0.0 | |
| | Post | 112 | 15 | 24.0 | 25.0 | 26.0 | 40 | 2.0 | |
| | | Pre | 169 | 6 | 24.0 | 25.0 | 27.0 | 32 | 3.0 |

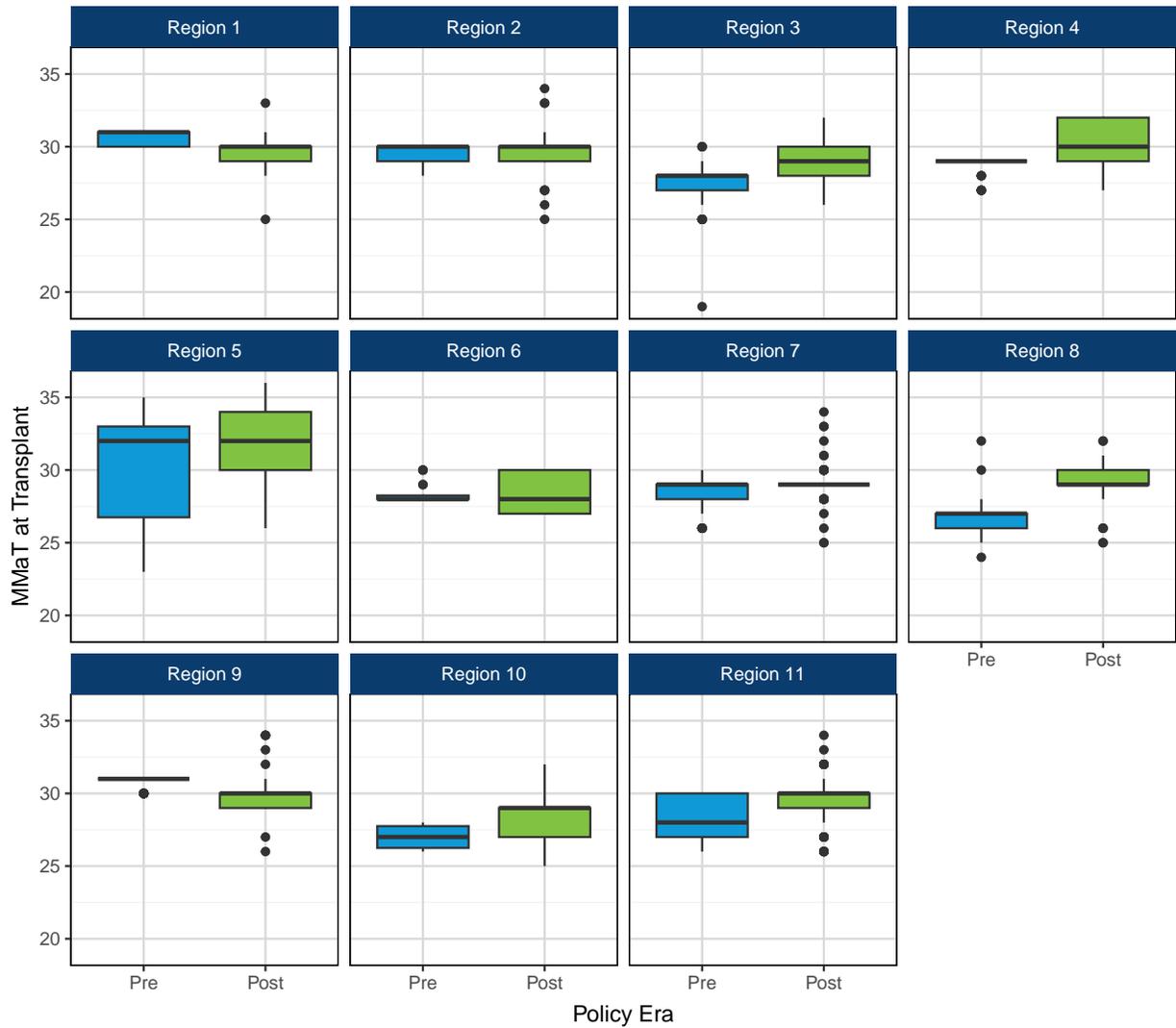
(continued)

| Exception Type | OPTN Region | Policy Era | N | Minimum | 25th Percentile | Median | 75th Percentile | Maximum | Interquartile Range |
|-------------------|-------------|------------|-----|---------|-----------------|--------|-----------------|---------|---------------------|
| Non-HCC Exception | 11 | Post | 184 | 15 | 26.0 | 27.0 | 27.2 | 31 | 1.2 |
| | | Pre | 23 | 27 | 28.0 | 28.0 | 35.0 | 50 | 7.0 |
| | 1 | Post | 51 | 22 | 27.0 | 28.0 | 33.0 | 40 | 6.0 |
| | | Pre | 92 | 17 | 27.0 | 27.0 | 35.0 | 45 | 8.0 |
| | 2 | Post | 85 | 22 | 27.0 | 30.0 | 34.0 | 48 | 7.0 |
| | | Pre | 103 | 15 | 24.0 | 25.0 | 35.0 | 45 | 11.0 |
| | 3 | Post | 99 | 17 | 26.0 | 27.0 | 30.0 | 40 | 4.0 |
| | | Pre | 98 | 16 | 26.0 | 28.0 | 35.0 | 42 | 9.0 |
| | 4 | Post | 93 | 19 | 27.0 | 29.0 | 33.0 | 40 | 6.0 |
| | | Pre | 144 | 6 | 26.0 | 30.0 | 35.0 | 49 | 9.0 |
| | 5 | Post | 220 | 15 | 29.0 | 31.5 | 35.0 | 45 | 6.0 |
| | | Pre | 36 | 23 | 25.0 | 27.0 | 35.0 | 40 | 10.0 |
| | 6 | Post | 28 | 24 | 27.0 | 28.0 | 35.2 | 40 | 8.2 |
| | | Pre | 97 | 23 | 26.0 | 26.0 | 29.0 | 40 | 3.0 |
| | 7 | Post | 121 | 22 | 26.0 | 27.0 | 30.0 | 42 | 4.0 |
| | | Pre | 55 | 21 | 24.0 | 28.0 | 35.0 | 40 | 11.0 |
| | 8 | Post | 74 | 15 | 26.0 | 29.0 | 31.8 | 42 | 5.8 |
| | | Pre | 70 | 26 | 28.0 | 28.0 | 32.8 | 65 | 4.8 |
| | 9 | Post | 79 | 22 | 27.0 | 30.0 | 32.0 | 40 | 5.0 |
| | | Pre | 49 | 18 | 24.0 | 25.0 | 30.0 | 40 | 6.0 |
| | 10 | Post | 70 | 22 | 24.0 | 27.0 | 29.0 | 40 | 5.0 |
| | | Pre | 91 | 15 | 24.0 | 27.0 | 35.0 | 41 | 11.0 |
| 11 | Post | 107 | 23 | 27.0 | 29.0 | 33.0 | 45 | 6.0 | |

Appendix Figure 13. Distribution of Median MELD at Transplant (MMaT) at Time of Transplant for Adult Liver-Alone Transplant Recipients who were Transplanted with HCC Exceptions by OPTN Region and Era.



Appendix Figure 14. Distribution of Median MELD at Transplant (MMaT) at Time of Transplant for Adult Liver-Alone Transplant Recipients who were Transplanted with Non-HCC Exceptions by OPTN Region and Era.



Appendix Table 8. Distribution of Median MELD at Transplant (MMaT) at Time of Transplant for Adult Liver-Alone Transplant Recipients Transplanted with Exceptions by OPTN Region and Era.

| Exception Type | OPTN Region | Policy Era | N | Minimum | 25th Percentile | Median | 75th Percentile | Maximum | Interquartile Range |
|-------------------|-------------|------------|-----|---------|-----------------|--------|-----------------|---------|---------------------|
| HCC Exception | 1 | Pre | 97 | 30 | 30.0 | 30 | 31.0 | 31 | 1.0 |
| | | Post | 99 | 26 | 29.5 | 30 | 30.0 | 34 | 0.5 |
| | 2 | Pre | 198 | 27 | 29.0 | 30 | 30.0 | 31 | 1.0 |
| | | Post | 205 | 24 | 29.0 | 30 | 30.0 | 34 | 1.0 |
| | 3 | Pre | 220 | 19 | 26.0 | 27 | 28.0 | 30 | 2.0 |
| | | Post | 222 | 17 | 29.0 | 29 | 30.0 | 32 | 1.0 |
| | 4 | Pre | 203 | 27 | 29.0 | 29 | 29.0 | 30 | 0.0 |
| | | Post | 239 | 26 | 29.0 | 31 | 32.0 | 32 | 3.0 |
| | 5 | Pre | 395 | 23 | 30.0 | 32 | 33.0 | 35 | 3.0 |
| | | Post | 436 | 26 | 31.0 | 33 | 34.0 | 36 | 3.0 |
| | 6 | Pre | 64 | 24 | 28.0 | 28 | 29.0 | 30 | 1.0 |
| | | Post | 80 | 24 | 27.0 | 28 | 30.0 | 30 | 3.0 |
| | 7 | Pre | 170 | 26 | 27.0 | 28 | 29.0 | 30 | 2.0 |
| | | Post | 161 | 25 | 29.0 | 29 | 29.0 | 33 | 0.0 |
| | 8 | Pre | 80 | 24 | 27.0 | 27 | 28.0 | 32 | 1.0 |
| | | Post | 119 | 24 | 28.0 | 29 | 30.0 | 32 | 2.0 |
| | 9 | Pre | 145 | 30 | 30.0 | 31 | 31.0 | 31 | 1.0 |
| | | Post | 169 | 26 | 29.0 | 30 | 30.0 | 35 | 1.0 |
| | 10 | Pre | 127 | 26 | 27.0 | 27 | 27.0 | 28 | 0.0 |
| | | Post | 111 | 25 | 27.0 | 28 | 29.0 | 34 | 2.0 |
| | 11 | Pre | 168 | 25 | 27.0 | 28 | 30.0 | 30 | 3.0 |
| | | Post | 184 | 24 | 29.0 | 30 | 30.0 | 32 | 1.0 |
| Non-HCC Exception | 1 | Pre | 16 | 30 | 30.0 | 31 | 31.0 | 31 | 1.0 |
| | | Post | 40 | 25 | 29.0 | 30 | 30.0 | 33 | 1.0 |
| | 2 | Pre | 55 | 28 | 29.0 | 30 | 30.0 | 30 | 1.0 |
| | | Post | 65 | 25 | 29.0 | 30 | 30.0 | 34 | 1.0 |
| | 3 | Pre | 76 | 19 | 27.0 | 28 | 28.0 | 30 | 1.0 |
| | | Post | 80 | 26 | 28.0 | 29 | 30.0 | 32 | 2.0 |
| | 4 | Pre | 57 | 27 | 29.0 | 29 | 29.0 | 29 | 0.0 |
| | | Post | 55 | 27 | 29.0 | 30 | 32.0 | 32 | 3.0 |
| | 5 | Pre | 99 | 23 | 26.8 | 32 | 33.0 | 35 | 6.2 |
| | | Post | 160 | 26 | 30.0 | 32 | 34.0 | 36 | 4.0 |
| | 6 | Pre | 25 | 28 | 28.0 | 28 | 28.2 | 30 | 0.2 |
| | | Post | 19 | 27 | 27.0 | 28 | 30.0 | 30 | 3.0 |
| | 7 | Pre | 77 | 26 | 28.0 | 29 | 29.0 | 30 | 1.0 |
| | | Post | 97 | 25 | 29.0 | 29 | 29.0 | 34 | 0.0 |
| | 8 | Pre | 32 | 24 | 26.0 | 27 | 27.0 | 32 | 1.0 |
| | | Post | 41 | 25 | 29.0 | 29 | 30.0 | 32 | 1.0 |
| | 9 | Pre | 54 | 30 | 31.0 | 31 | 31.0 | 31 | 0.0 |
| | | Post | 53 | 26 | 29.0 | 30 | 30.0 | 34 | 1.0 |
| | 10 | Pre | 34 | 26 | 26.2 | 27 | 27.8 | 28 | 1.5 |
| | | Post | 59 | 25 | 27.0 | 29 | 29.0 | 32 | 2.0 |
| | 11 | Pre | 55 | 26 | 27.0 | 28 | 30.0 | 30 | 3.0 |
| | | Post | 66 | 26 | 29.0 | 30 | 30.0 | 34 | 1.0 |