Final Report

OPTN Lung Transplantation Committee | Descriptive Data Request

Lung Continuous Distribution Two-Year Monitoring Report

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Executive Summary

Monitoring began upon implementation of continuous distribution on March 9, 2023. Based on the first two years of data collection, compared to the pre-policy era (March 09, 2021 - March 08, 2023), in the post-policy era (March 09, 2023 - March 08, 2025):

Overall

- The transplant rate increased by 31% from 269 transplants per 100 patient years to 354 transplants per 100 patient years.
- The waiting list mortality rate decreased by 34% from 26 deaths or removals for too sick per 100 patient years to 17 deaths or removals for too sick per 100 patient years.
- There was no significant change in the probability of patient survival one year after transplant (89.3% in the pre-policy era vs 90.6% in the post-policy era).

Continuous Distribution Attributes

- In the post-policy era, compared to less medically urgent candidates, the most medically urgent candidates (those with at least 2.5 medical urgency points) had the highest rates of transplant, the highest rates of waiting list removals for death or too sick, and the shortest median waiting time for a transplant. In addition, the median travel distance from the donor hospital to transplant program was greatest for the most medically urgent candidates.
- The transplant rate remained similar for pediatric candidates $<$12 years old, but increased slightly for pediatric candidates between 12 and 17 years old, though sample sizes were small. Pediatric priority increased on adult donor match runs but decreased slightly on pediatric donor match runs.
- Blood type was evaluated based on three cohorts: the Pre-CD era, the Post-CD era, and the Post-CD era after the ABO modification. Compared to the Pre-CD era, the transplant rate in the Post-CD era increased for candidates with blood types A, AB, and B and remained higher in the Post-CD + ABO Modification era. However, the transplant rate for candidates with blood type O decreased slightly from the Pre-CD era to the Post-CD era and increased from the Post-CD era to the Post-CD + ABO Modification era. The median time to transplant remained higher for blood type O candidates compared to candidates of other blood types across all three eras.
- The transplant rate increased for candidates across all adult height groupings. Taller candidates had higher transplant rates compared to shorter candidates.

Other Noteworthy Results

- Median distance from the donor hospital to transplant program increased for both DCD and non-DCD organs.
- The utilization rate increased slightly for both DCD and non-DCD donors.
- The non-use rate remained similar for both DCD and non-DCD organs. However, the number of lungs recovered from DCD donors increased by 109%.
- The median number of programs that received organ offers both before and after the final acceptor increased.
- The number of registrations with at least one submitted exception request increased by 110% (from 265 to 558).
- Since the implementation of the ABO Modification in September 2023, the number of overall exception requests submitted each month decreased and then leveled off. However, the number of biological disadvantage exception requests submitted increased slightly over the last 5 months.
- The transplant rate increased slightly for lung/liver patients, remained similar for heart/lung patients, and decreased slightly for lung/kidney patients. The median time to transplant increased for heart/lung patients and lung/kidney patients but decreased for lung/liver patients.

The implications of the policy change will continue to be monitored closely, with the next report scheduled to be presented to the OPTN Lung Transplantation Committee in Spring 2026.

Background/Purpose

On March 9, 2023 the lung allocation policy switched to a continuous distribution framework. Continuous distribution (CD) uses a composite allocation score to determine the preferential order of candidates on a match run when a medically suitable lung donor becomes available. This point-based system replaces the previous, classification-based system. Under the classification-based system, candidates were first arranged into ordered groups (e.g., "blood type identical, within 250 nautical miles of the donor hospital") and then, within each group, preferentially ordered by Lung Allocation Score (LAS). In contrast, continuous distribution does not use candidate groupings. All candidates are prioritized using a composite allocation score (CAS) that takes into account medical, biological, and other factors permitted by the Final Rule to determine preferential ordering on a match run. These attributes include:

- Medical urgency: a metric that captures the patient's predicted 1-year survival on the waiting list without a transplant (this measure was a component of LAS)
- Post-transplant survival: a metric that captures the patient's predicted 5-year survival were they to receive a transplant (a 1-year version of this measure was a component of LAS)
- Biological disadvantage: a measure of how disadvantaged a candidate is to receive a transplant based on aspects of their biology, including blood type, CPRA (calculated panel reactive antibody), and height
- Patient access: a measure that considers whether the candidate is pediatric or a prior living donor
- Efficiency: a measure that captures the efficiency of the transplant, in terms of both distance from the donor hospital to transplant program and logistical planning

Based on data from the three-month monitoring report showing that the number of transplants declined in the first three months of continuous distribution for blood type O candidates, a policy change was implemented on September 27, 2023 which altered the blood type rating scale. This report will evaluate the impact of the modified blood type rating scale, in addition to the evaluation of lung continuous distribution as a whole.

In addition to the analyses included in this report, the OPTN Lung Policy Monitoring Dashboard has been developed to further assist with post-implementation monitoring. This dashboard displays counts of lung waiting list additions, removals for death or too sick, and transplants across policy eras and stratified by various patient criteria. It also includes information on lung donors, non-use rates, utilization rates, and match efficiency.

The purpose of this report is to provide metrics summarizing the impact of the policy change. In an effort to provide data as soon as possible, this report was produced before the 90-day data lag allotted by OPTN policy has fully passed; therefore, data are subject to change. The OPTN will respond to further requests for data by the OPTN Lung Transplantation Committee.

Committee Request

Monitoring reports using pre vs. post comparisons will be presented to the Committee after approximately 3 months, 6 months and then annually for 3 years following the allocation change.

The Committee will consider overall waiting list deaths and post-transplant deaths, as well as variance in waiting list deaths, post-transplant deaths, and distance between donor and candidate transplant hospitals as key metrics to evaluate the effectiveness of the proposal.

Metrics to be evaluated include:

- Waiting List
  - Number of candidates ever waiting, additions, and removals
  - Distribution of WLAUC (waiting list area under the curve, a measure of candidates' expected survival on the waiting list without a transplant) and PTAUC (post-transplant area under the curve, a measure of candidates' expected post-transplant survival)
  - Population characteristics such as CPRA, prior living donor, height, age group at time of listing, and diagnosis group
  - Number of candidates by OPTN region
  - Candidate waiting time by OPTN region

  - Numbers of patient deaths, overall and by diagnosis group, medical urgency score, post-transplant survival score, and OPTN region
  - Overall waiting list mortality rate and transplant rate by diagnosis group, WLAUC and PTAUC groups, and OPTN region
  - Number of exception requests, overall and by diagnosis group
  - Number of multiorgan candidates
- Transplants
  - Number of recipients
  - Distribution of WLAUC and PTAUC
  - Population characteristics such as CPRA, prior living donor, height, age group at time of listing, and diagnosis group
  - Number of recipients by OPTN region
  - Patient post-transplant survival
  - Number of recipients transplanted with an exception request, overall and by diagnosis group
  - Distance between the donor hospital and transplant program
  - Distance between the donor hospital and transplant program by medical urgency group, post-transplant survival, and by composite allocation score group
  - Transplant rate changes by transplant program size (small, medium, large)
  - Distribution of ischemic time
  - Number of multiorgan recipients
- Utilization
  - Non-use rate by OPTN region and donation after circulatory death (DCD) vs. non-DCD
  - Utilization rate by OPTN region and DCD vs. non-DCD
  - Number & percentage of perfused lungs by OPTN region
  - Number & percentage of DCD lungs transplanted by OPTN region
  - Time from first electronic offer to cross clamp
  - Distribution of sequence number of the final acceptor

Analysis of post-transplant outcomes will be performed after sufficient follow-up data have accrued, which is dependent on submission of follow-up forms. The OPTN and SRTR contractors will work with the committee to define the specific analyses requested for ongoing monitoring for each update. The OPTN Equity in Access dashboard will also be used to evaluate the impact of this policy on transplant rates by various candidate attributes.

Methods

Data Sources

Organ Procurement and Transplantation Network (OPTN) data were used for this analysis. The OPTN data system includes data on all donors, waitlisted candidates, and transplant recipients in the United States, submitted by members of the OPTN. Continuous distribution was implemented on March 9, 2023. Unless otherwise stated, this report compares metrics for 2 years before and after the implementation date, with the pre era spanning March 09, 2021 to March 08, 2023 and the post era spanning March 09, 2023 to March 08, 2025. The only exceptions for these defined policy eras are in the blood type section and the post-transplant survival analyses (described below). To evaluate the impact of continuous distribution implementation, as well as the implementation of the blood type modification in September 2023, the data have been split into the following three eras for the blood type analysis: Blood Type Pre-CD (March 09, 2021 to March 08, 2023; 2 years), Blood Type Post-CD (March 09, 2023 to September 26, 2023; ~6.5 months), and Blood Type Post-CD + ABO Modification (September 27, 2023 to March 08, 2025; ~1.5 years).

In an effort to provide data as soon as possible, this report was produced with OPTN data as of April 25, 2025 and before the 90-day data lag allotted by OPTN policy has fully passed. Data are subject to change due to future database submission or correction.

For continuous variables, medians and ranges were reported, and for categorical variables, counts and frequencies were reported. All analyses involving counts of waiting list additions, transplants, or removals for death or too sick

stratified by a single variable have been omitted from this report and instead are available on the OPTN Lung Policy Monitoring Dashboard. For all rates, 95% confidence intervals were reported, as well as the number of unique patients on the waiting list that belonged to each grouping. Diagnosis groups utilized in this monitoring report align with those outlined in OPTN lung allocation policy: A- obstructive lung disease, B- pulmonary vascular disease, C- cystic fibrosis and immunodeficiency disorder, and D- restrictive lung disease {OPTN Policies, https://optn.transplant.hrsa.gov/media/1200/optn_policies.pdf Accessed 4/21/2025}.

Waiting List

Cohort: For all analyses (except for within the blood type section) candidates added to the lung waiting list, removed from the waiting list, or ever waiting for a lung-alone transplant from March 09, 2021 through March 08, 2023 (pre) and March 09, 2023 through March 08, 2025 (post) were included. For the blood type analyses, candidates added to the lung waiting list, removed from the waiting list, or ever waiting for a lung-alone transplant from March 09, 2021 through March 08, 2023 (Blood Type: Pre-CD), March 09, 2023 through September 26, 2023 (Blood Type: Post-CD), and September 27, 2023 through March 08, 2025 (Blood Type: Post-CD + ABO Modification) were included. A separate analysis was conducted for candidates listed for a lung-multiorgan transplant, which included all candidates waiting for a lung and at least one other organ from March 09, 2021 through March 08, 2023 (pre) and March 09, 2023 through March 08, 2025 (post).

Analysis: All of the CAS attributes were calculated based on clinical data entered in the OPTN Waiting List. For all candidates on the waiting list, a CAS subscore was calculated. This subscore summed all the CAS attribute points except for the efficiency points (i.e., medical urgency points, post-transplant survival points, biological disadvantage points, and patient access points). Efficiency points are not known until the time a match is made and the distance between the donor hospital and transplant program is known. For this reason, all analyses in this section used the CAS subscore, rather than the final CAS.

For all CAS attributes (including medical urgency, post-transplant survival, and the CAS subscore), candidates have both a calculated and a match score; these differ when a candidate has an approved exception request, which causes the match score to be higher than the calculated score. For all analyses, the match scores (the same scores used for allocation) were used as reported at the time of removal from the waiting list.

Exceptions in each era were determined based on submissions to the National Lung Review Board. Under the previous allocation system (LAS), a single registration could only have one approved and active exception request at a time (although a registration could submit more than one request if the first request was denied). Under continuous distribution, using the CAS, a single registration can have multiple exception requests. Prior to continuous distribution implementation, programs could submit CAS exception requests through an interim process so that those requests, if approved, would be in place at the start of implementation. Twenty-six lung requests and one heart/lung request were submitted through this process and were not included in these analyses. Exceptions were analyzed at the registration level whenever possible (where one registration can have more than one exception request submitted and approved under continuous distribution). However, when the metric of interest depended on the outcome of a specific request submission (i.e., request approvals), analyses were performed at the form submission level.

Waiting list mortality rates are reported as the number of deaths or removals for too sick per 100 patient years. Patient years is a type of measurement that takes into account both the number of patients that experience an event and the amount of time they spend waiting for an event. For example, if 100 patients waited for one year that would amount to 100 patient years of data. Similarly, if 10 patients waited for 10 years that would also amount to 100 patient years of data. For a subject like transplant, time waiting is sometimes just as important as the event itself. For example, we are interested in the number of transplants or removals for death or too sick, but also interested in how long candidates waited during the study period. It is important to use this type of rate because the waiting list is dynamic and people are added and removed at different points in time. We set rates to per 100 patient years for ease in comparing rates across populations that might vary in size or duration of time waited. For this analysis, active and inactive waiting time were used for the patient 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 death or removal for too sick is attributed only to the era in which it occurred. Waiting list mortality rates were calculated for the population as a whole, as well as for sub-populations based on a variety of different attributes. For time-varying attributes, such as medical urgency points and post-transplant survival

points, a time-varying analysis was performed.

Transplant

Cohort: For all analyses (except for within the blood type section) recipients that received a lung-alone transplant from March 09, 2021 through March 08, 2023 (pre) and March 09, 2023 through March 08, 2025 (post) were included. For the blood type analyses, recipients that received a lung-alone transplant from March 09, 2021 through March 08, 2023 (Blood Type: Pre-CD), March 09, 2023 through September 26, 2023 (Blood Type: Post-CD), and September 27, 2023 through March 08, 2025 (Blood Type: Post-CD + ABO Modification) were included. A separate analysis was conducted for lung-multiorgan transplants which included all recipients who received a lung and at least one other organ from March 09, 2021 through March 08, 2023 (pre) and March 09, 2023 through March 08, 2025 (post).

Analysis: For all analyses using CAS attributes, the match score at the time of transplant was used. Transplant rates are reported as the number of transplants per 100 patient years. This rate is calculated by dividing the number of all deceased donor lung transplants by the number of years patients spent waiting. For each policy era, active and inactive waiting time within the era analyzed were used for the patient 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 transplant is attributed only to the era in which it occurred. Transplant rates were calculated for the population as a whole, as well as for sub-populations based on a variety of different attributes. For time-varying attributes, such as medical urgency points and post-transplant survival points, a time-varying analysis was performed.

Utilization

Cohort: All donors from which at least one organ was recovered for the purposes of transplantation from March 09, 2021 through March 08, 2023 (pre) and March 09, 2023 through March 08, 2025 (post) were included.

Analysis: The utilization rate is defined as the percent of lungs that are transplanted based on all possible lungs from every deceased donor with at least one organ recovered for the purpose of transplant; this assumes that each donor has two possible lungs for donation. The non-use rate is defined as the percent of lungs recovered for the purpose of transplant but not transplanted out of all lungs recovered for transplant.

Median Waiting Time

Cohort: For all analyses (except for within the blood type section) all registrations added to the waiting list for a lung-alone transplant from March 09, 2021 through March 08, 2023 (pre) and March 09, 2023 through March 08, 2025 (post) were included. For the blood type analyses, all registrations added to the waiting list for a lung-alone transplant from March 09, 2021 through March 08, 2023 (Blood Type: Pre-CD), March 09, 2023 through September 26, 2023 (Blood Type: Post-CD), and September 27, 2023 through March 08, 2025 (Blood Type: Post-CD + ABO Modification) were included. A separate analysis was conducted for registrations listed for a lung-multiorgan transplant, which included all registrations added to the waiting list for a lung and at least one other organ from March 09, 2021 through March 08, 2023 (pre) and March 09, 2023 through March 08, 2025 (post).

Analysis: We calculated the median waiting time based on a variety of different attributes using a competing risk analysis. Because these analyses were run without the data lag, results may vary slightly as more data accrue.

Match Run Analysis

Cohort: All lung match runs submitted from March 09, 2021 through March 08, 2023 (pre) and March 09, 2023 through March 08, 2025 (post) were included. For most analyses, only matches with an acceptance were included, and offers after the final acceptance were excluded. However, when counting the number of programs offered after the final acceptor, all offers up until the match was closed (which includes offers after the final acceptance) were included.

Analysis: We calculated descriptive metrics for the number of offers sent in the pre and post eras, as well as the sequence number of the final acceptor. We also calculated the cumulative percent of offers received for pediatric candidates up to each sequence number on the match run, using the following equation:

$$\frac{\text{Number of offers received by pediatric candidates up to sequence number i}}{\text{Number of offers sent to all candidates up to sequence number i, on match runs with at least one pediatric offer sent}}$$

Post-Transplant Patient Survival

Cohort: For all analyses (except for within the blood type section) recipients that received a lung-alone transplant from June 09, 2022 through March 08, 2023 (pre) and March 09, 2023 through December 08, 2023 (post) were included. For the blood type analyses, recipients that received a lung-alone transplant from August 19, 2022 through March 08, 2023 (Blood Type: Pre-CD), March 09, 2023 through September 26, 2023 (Blood Type: Post-CD), and September 27, 2023 through April 15, 2024 (Blood Type: Post-CD + ABO Modification) were included. A separate analysis was conducted for lung-multiorgan transplants which included all recipients who received a lung and at least one other organ from June 09, 2022 through March 08, 2023 (pre) and March 09, 2023 through December 08, 2023 (post).

Analysis: Unadjusted one-year post-transplant patient survival was calculated using Kaplan-Meier methodology for the population as a whole, as well as for sub-populations based on a variety of different attributes. For blood type, unadjusted six-month post-transplant survival was calculated using the same methodology.

Results

For this report, the Results are broken into four main subsections:

- The **Overall** subsection focuses on general trends associated with the implementation of continuous distribution.
- The **Continuous Distribution Attributes** subsection evaluates trends associated with each of the individual attributes of continuous distribution in an effort to determine whether the specific goals of the policy are being met.
- The **Exceptions** subsection assesses the impact of continuous distribution on exception request submission and approval practices.
- The **Multiorgan** subsection evaluates trends in multiorgan listings and transplants under continuous distribution.

In addition to the analyses included in this report, the **OPTN Lung Policy Monitoring Dashboard** has been developed to further assist with post-implementation monitoring. The policy monitoring dashboard displays counts of lung waiting list additions, removals for death or too sick, and transplants across policy eras and stratified by various patient criteria. In addition, it includes information on lung donors, non-use rates, utilization rates, and match efficiency. The intent is that the dashboard will allow for near-continuous monitoring of any policy change by all members of the lung transplantation community. As a result, lung monitoring reports will shift to a key metrics framework, which are more concise and focus explicitly on evaluating the key metrics of a policy change. Charts from previous monitoring reports that are duplicative of the dynamic and interactive charts in the dashboard have been eliminated from this monitoring report to prevent redundancy.

Overall

The number of deaths or removals for too sick per 100 patient years on the waiting list decreased from 25.74 in the pre era to 17.00 in the post era.

Figure 1: Deaths or Removals for Too Sick per 100 Patient Years on the Waiting List by Era

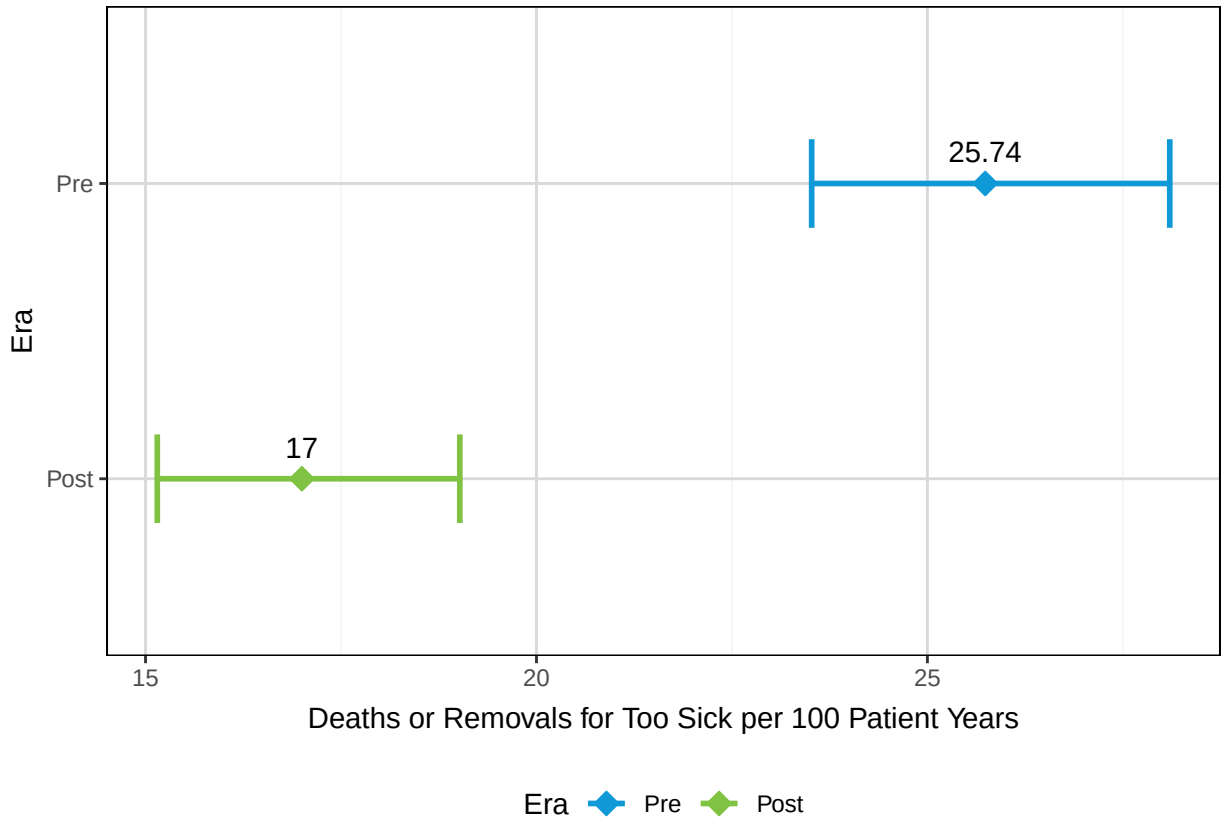


Table 1: Deaths or Removals for Too Sick per 100 Patient Years on the Waiting List by Era

Era	N Patients	Deaths or Removals for Too Sick per 100 Patient Years	95% Confidence Interval
Pre	6829	25.74	(23.52, 28.10)
Post	7690	17.00	(15.15, 19.02)

The number of transplants per 100 patient years on the waiting list increased from 269.22 in the pre era to 353.99 in the post era.

Figure 2: Lung Transplants per 100 Patient Years on the Waiting List by Era

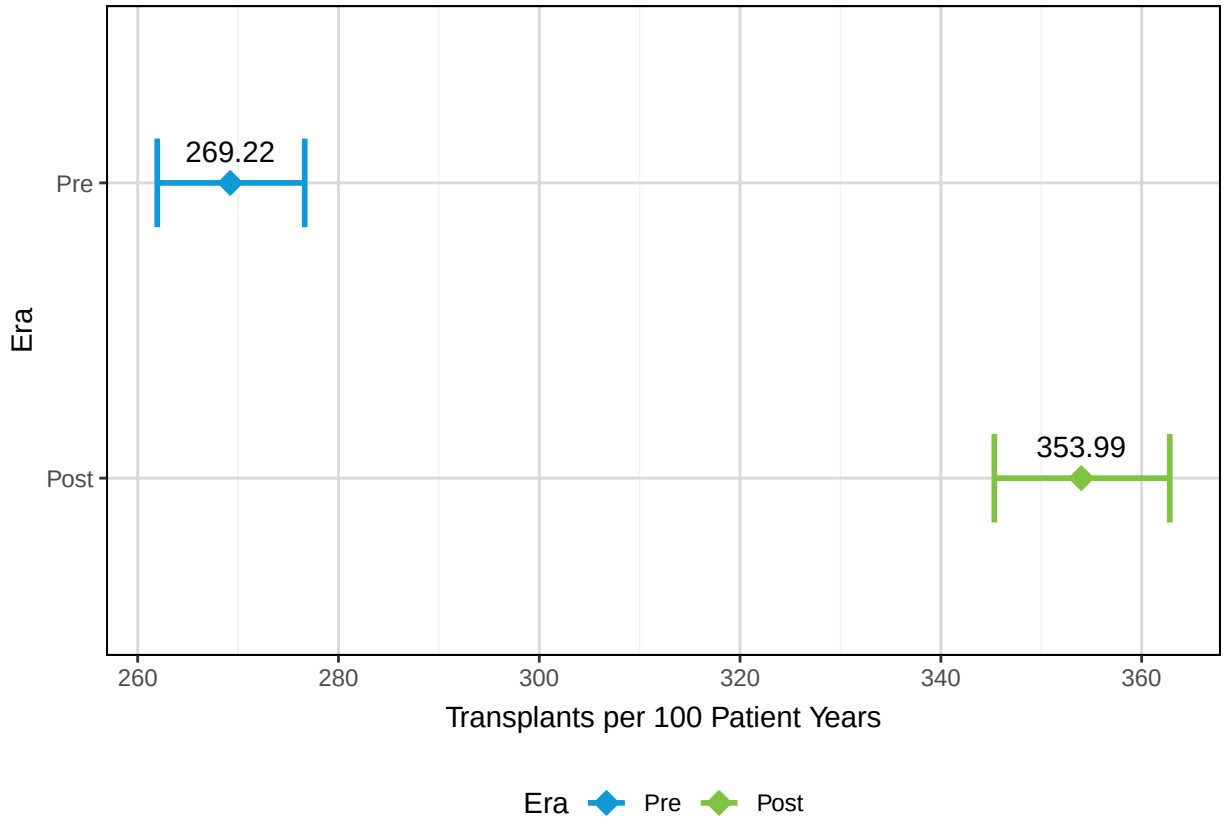
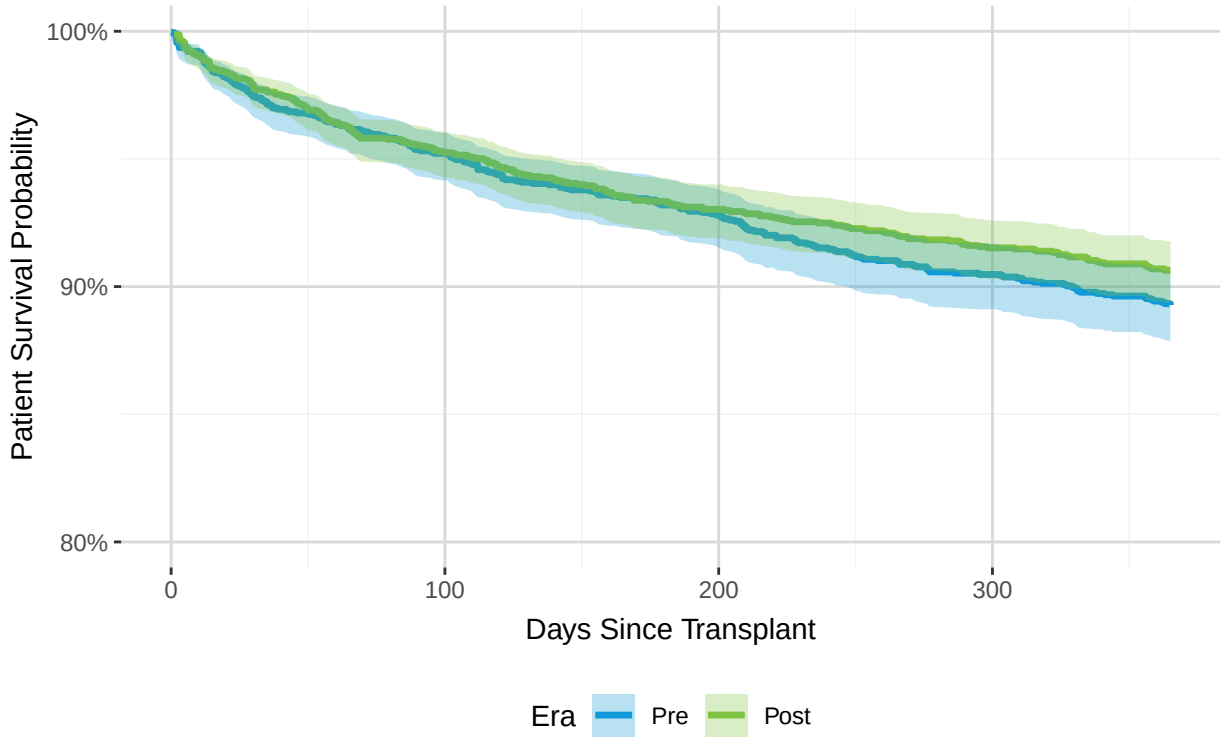


Table 2: Lung Transplants per 100 Patient Years on the Waiting List by Era

Era	N Patients	Transplants per 100 Patient Years	95% Confidence Interval
Pre	6829	269.22	(261.95, 276.64)
Post	7690	353.99	(345.33, 362.80)

There was no significant change in the probability of patient survival at one year post-transplant after continuous distribution implementation (89.3% vs 90.6%).

Figure 3: One-Year Post-Transplant Patient Survival by Era



In this analysis, the pre−policy era includes transplant recipients from June 09, 2022 to March 08, 2023 and the post−policy era includes transplant recipients from March 09, 2023 to December 08, 2023.

Table 3: One-Year Post-Transplant Patient Survival by Era

Era	N Patients	N Deaths	1-Year Survival	95% Confidence Interval
Pre	2032	217	89.3%	(87.8%, 90.6%)
Post	2273	211	90.6%	(89.4%, 91.8%)

[a] In this analysis, the pre-policy era includes transplant recipients from June 09, 2022 to March 08, 2023 and the post-policy era includes transplant recipients from March 09, 2023 to December 08, 2023.

Continuous Distribution Attributes

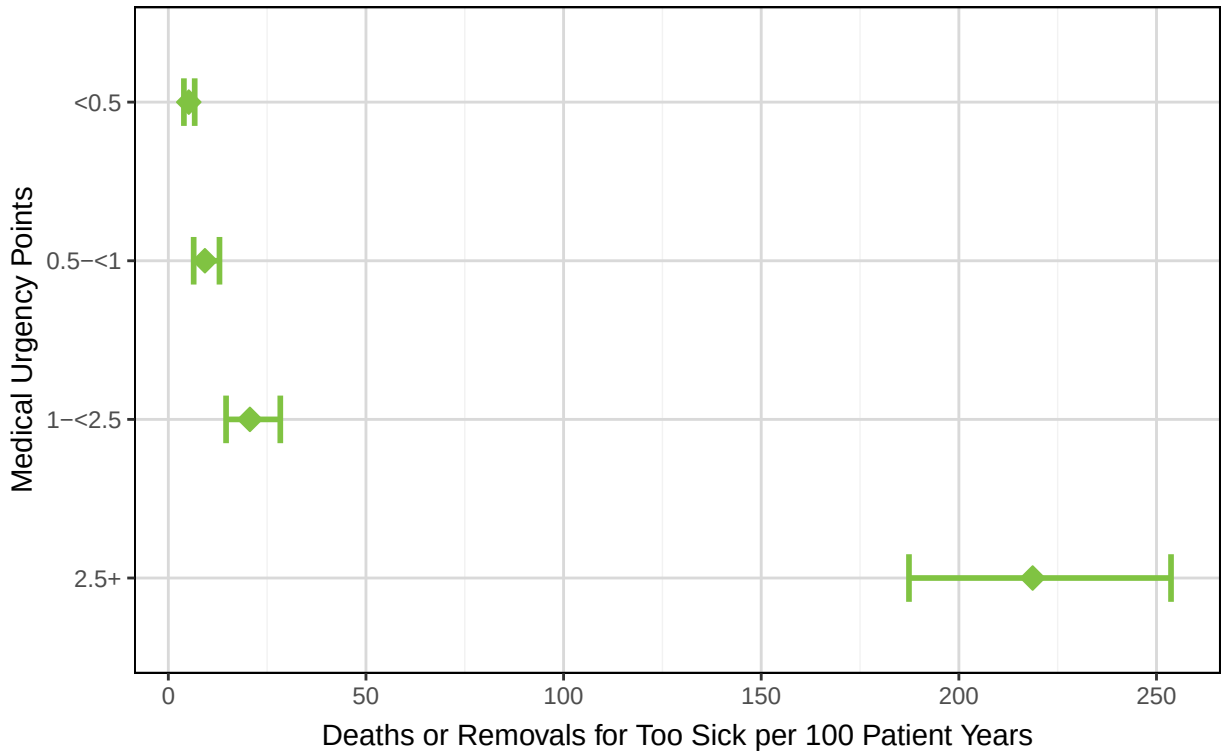
This subsection evaluates trends associated with each of the individual attributes of continuous distribution in an effort to determine whether the specific goals of the policy are being met.

Medical Urgency

Medical urgency points were not calculated in the pre-policy era; thus, all metrics in this section only include data from the post-policy era (from March 09, 2023 to March 08, 2025). In addition, all analyses reflect patients' match medical urgency points, which include any approved exception requests and are the scores used in allocation. Finally, both rate analyses included in this section were run with time-varying data, meaning that they account for patients' changing medical urgency points during their tenure on the waiting list. As patients' medical urgency scores change, they will contribute waiting time to whichever grouping they fall into at that point in time, and an event (transplant or removal for death or too sick) will be attributed to whichever grouping they were in when the event occurred.

The number of deaths or removals for too sick per 100 patient years on the waiting list was greatest for the most medically urgent individuals (those with at least 2.5 medical urgency points).

Figure 4: Deaths or Removals for Too Sick per 100 Patient Years on the Waiting List by Time-Varying Medical Urgency Points in the Post-Policy Era



Rates were calculated using patients' time−varying medical urgency points. This means that as a patient's medical urgency score changes, they will contribute waiting time to whichever grouping they fall into at that point in time.

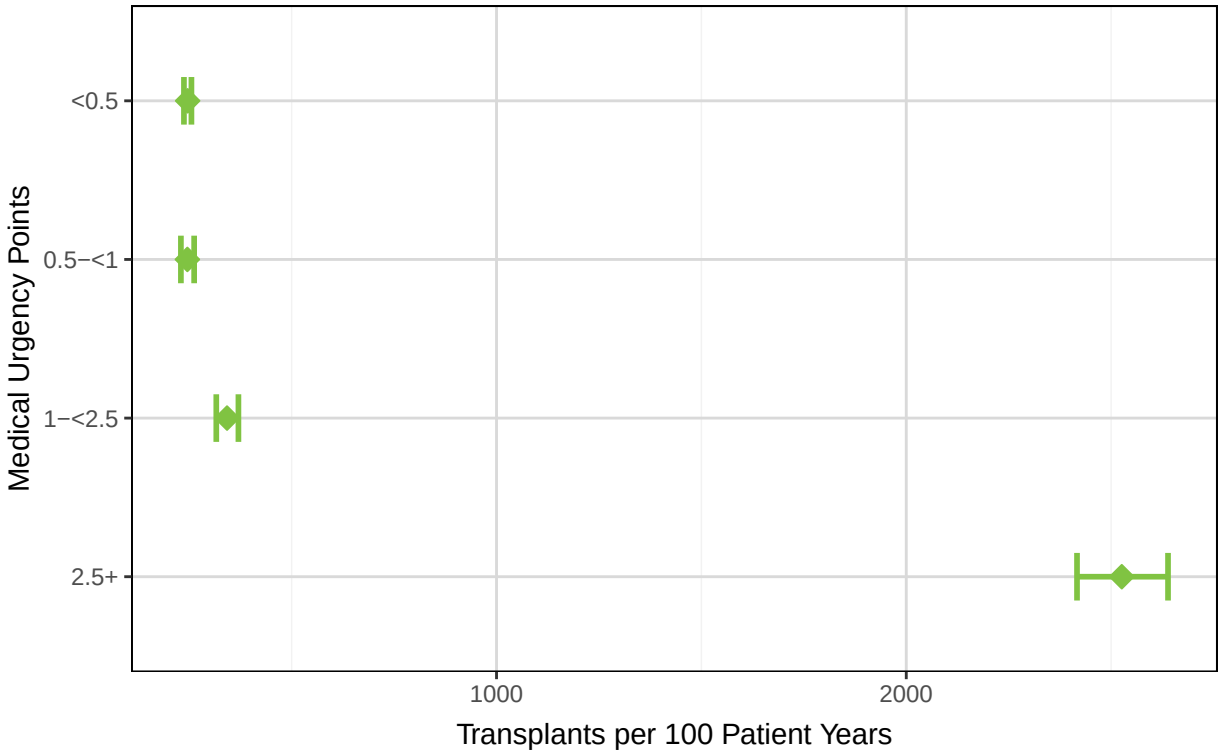
Table 4: Deaths or Removals for Too Sick per 100 Patient Years on the Waiting List by Time-Varying Medical Urgency Points in the Post-Policy Era

Medical Urgency Points	N Patients	Deaths or Removals for Too Sick per 100 Patient Years	95% Confidence Interval
<0.5	4468	5.17	(3.94, 6.67)
0.5-<1	2059	9.26	(6.41, 12.94)
1-<2.5	1553	20.64	(14.61, 28.33)
2.5+	2380	218.67	(187.38, 253.68)

[a] Rates were calculated using patients' time-varying medical urgency points. This means that as a patient's medical urgency score changes, they will contribute waiting time to whichever grouping they fall into at that point in time.

The number of transplants per 100 patient years on the waiting list was greatest for the most medically urgent individuals (those with at least 2.5 medical urgency points).

Figure 5: Lung Transplants per 100 Patient Years on the Waiting List by Time-Varying Medical Urgency Points in the Post-Policy Era



Rates were calculated using patients' time−varying medical urgency points. This means that as a patient's medical urgency score changes, they will contribute waiting time to whichever grouping they fall into at that point in time.

Table 5: Lung Transplants per 100 Patient Years on the Waiting List by Time-Varying Medical Urgency Points in the Post-Policy Era

Medical Urgency Points	N Patients	Transplants per 100 Patient Years	95% Confidence Interval
<0.5	4468	246.13	(237.11, 255.41)
0.5-<1	2059	245.45	(229.68, 262.01)
1-<2.5	1553	342.25	(316.04, 370.05)
2.5+	2380	2525.99	(2416.75, 2638.88)

[a] Rates were calculated using patients' time-varying medical urgency points. This means that as a patient's medical urgency score changes, they will contribute waiting time to whichever grouping they fall into at that point in time.

Median time to transplant was shortest for the most medically urgent candidates (candidates with at least 2.5 medical urgency points at the time of listing).

Figure 6: Median Time to Transplant (Days) by Medical Urgency Points at Listing in the Post-Policy Era

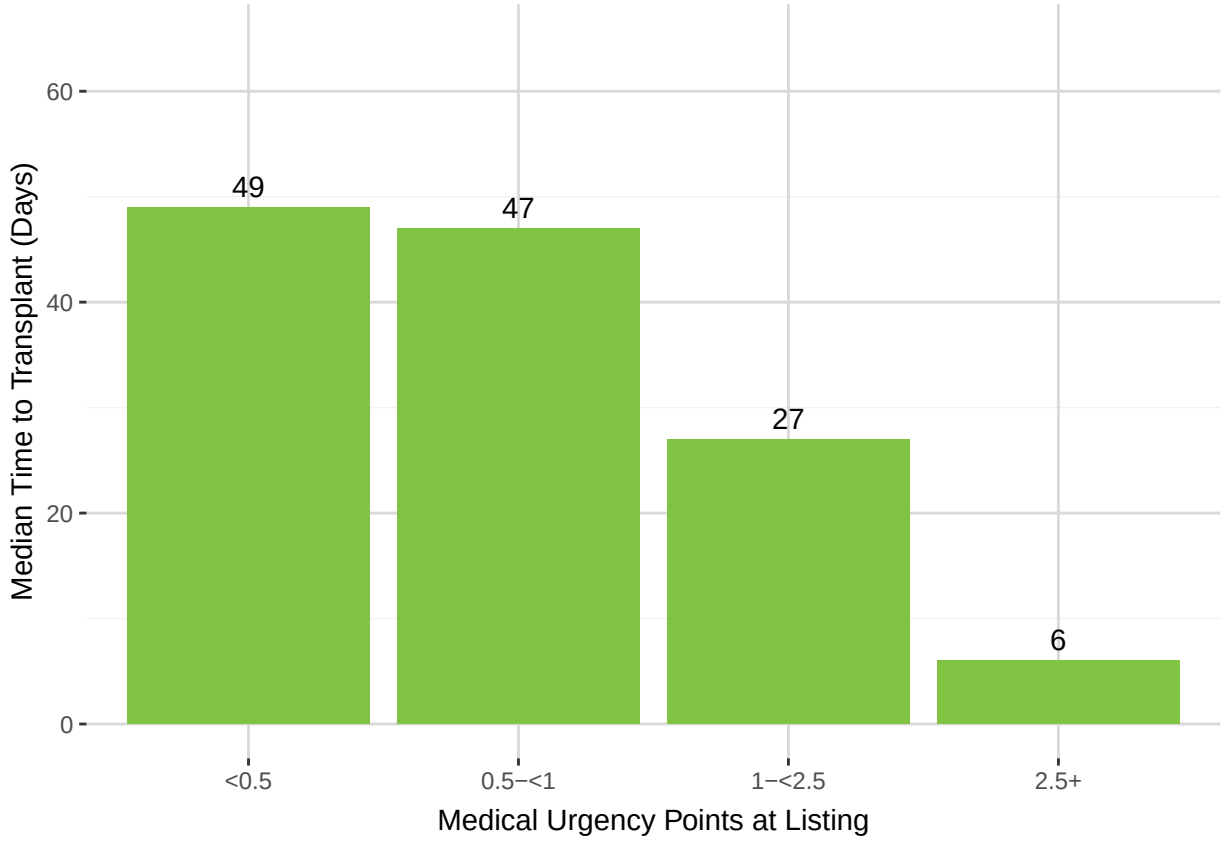
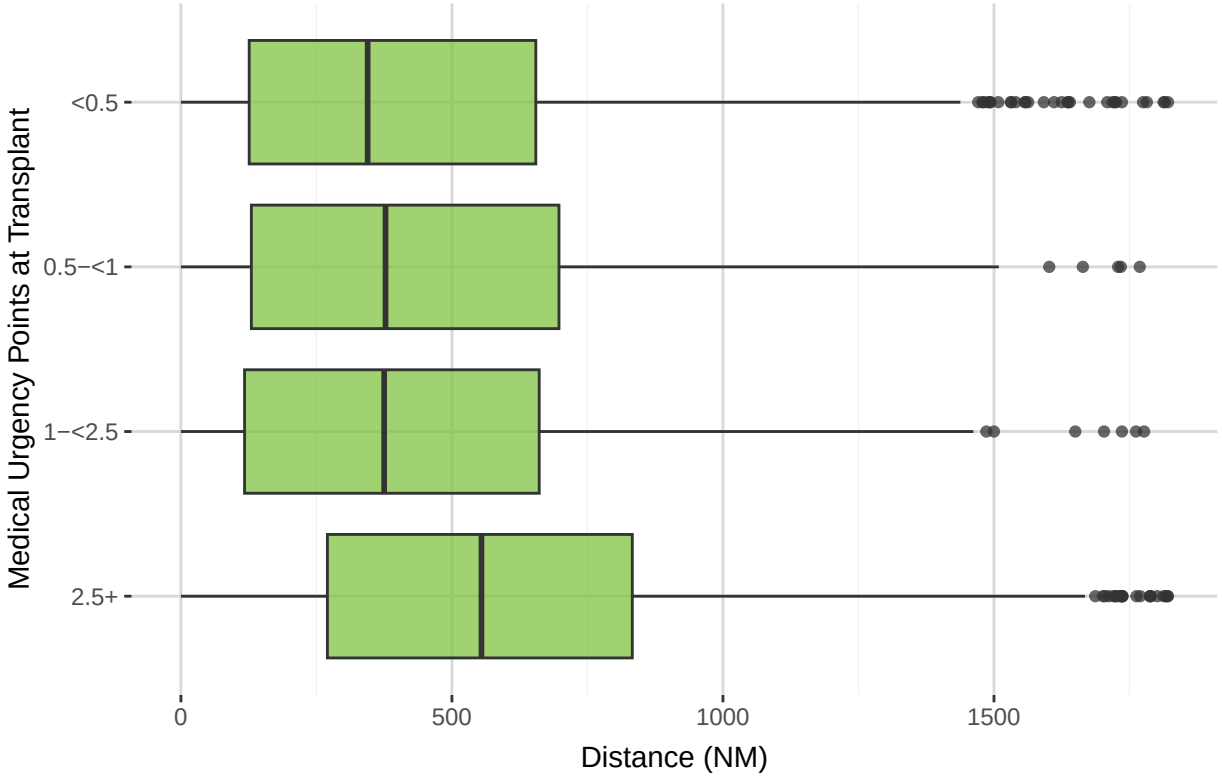


Table 6: Median Time to Transplant (Days) by Medical Urgency Points at Listing in the Post-Policy Era

Medical Urgency Points at Listing	N Registrations	Median Time to Transplant (Days)
<0.5	3623	49
0.5-<1	1304	47
1-<2.5	711	27
2.5+	1255	6

In the post-policy era, median distance for the most medically urgent recipients (those with 2.5 or more medical urgency points at the time of transplant) was greater (562 NM) than the median distance for all other recipients. Before implementation, SRTR modeling indicated travel distances would increase for the most medically urgent recipients.

Figure 7: Distribution of Distance (in Nautical Miles) from Donor Hospital to Transplant Program by Medical Urgency Points at Transplant in the Post-Policy Era



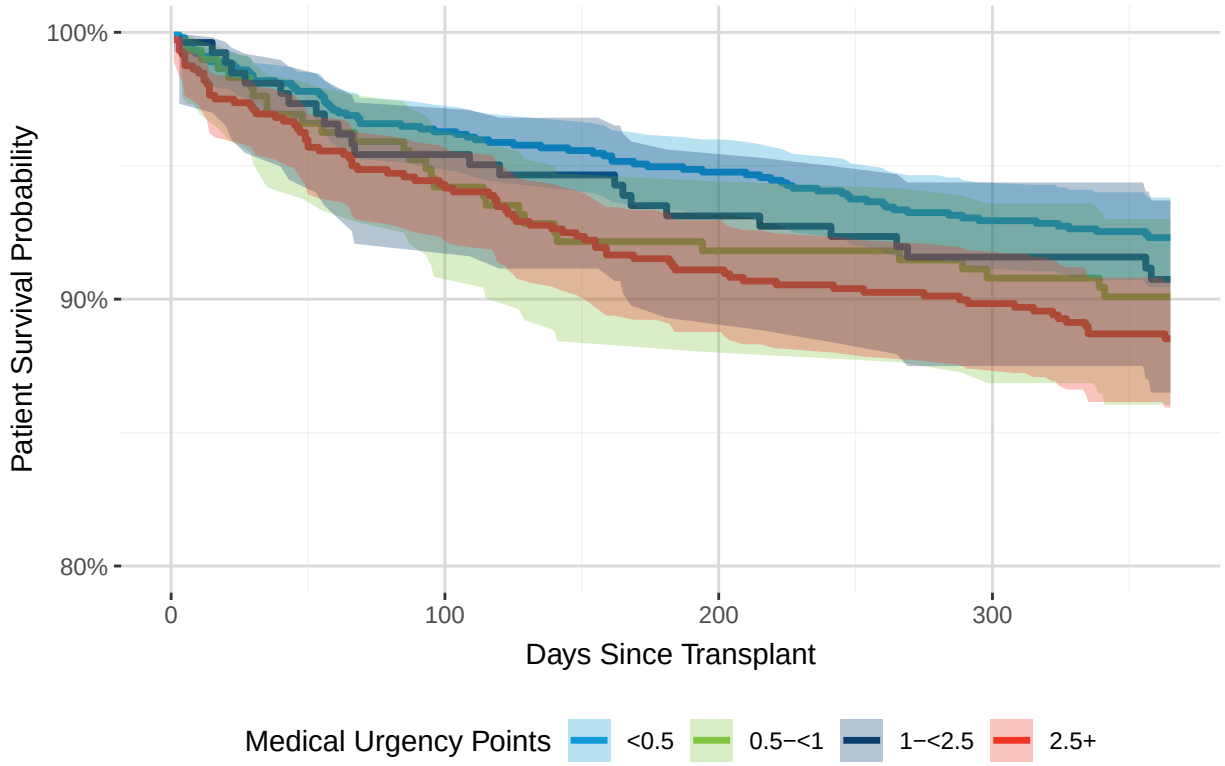
View is restricted to the 99th percentile of distance (1821 NM). There were 66 cases where lungs traveled further than this distance in the post−policy era.

Table 7: Distribution of Distance (in Nautical Miles) from Donor Hospital to Transplant Program by Medical Urgency Points at Transplant in the Post-Policy Era

Medical Urgency Points at Transplant	N	N Missing	Min	25th Percentile	Median	Mean	75th Percentile	Max
<0.5	2739	0	0	127.00	349	442.82	664.50	2920
0.5-<1	874	0	0	132.00	382	465.30	710.75	2185
1-<2.5	688	0	0	117.75	375	429.24	665.00	2349
2.5+	2090	0	0	273.00	562	611.51	851.75	2261
Total	6391	0	0	171.00	419	499.60	741.00	2920

There were no significant differences in one-year patient post-transplant survival by recipients' medical urgency points in the post-policy era; however, survival tended to be slightly higher for less medically urgent patients.

Figure 8: One-Year Post-Transplant Patient Survival by Medical Urgency Points at Transplant in the Post-Policy Era



In this analysis, the post–policy era includes transplant recipients from March 09, 2023 to December 08, 2023.

Table 8: One-Year Post-Transplant Patient Survival by Medical Urgency Points at Transplant in the Post-Policy Era

Medical Urgency Points	N Patients	N Deaths	1-Year Survival	95% Confidence Interval
<0.5	996	76	92.3%	(90.5%, 93.8%)
0.5-<1	295	29	90.1%	(86.1%, 93.0%)
1-<2.5	262	24	90.7%	(86.5%, 93.7%)
2.5+	720	82	88.5%	(85.9%, 90.6%)

[a] In this analysis, the post-policy era includes transplant recipients from March 09, 2023 to December 08, 2023.

Post-Transplant Survival

Post-transplant survival points were not calculated in the pre-policy era; thus, all metrics in this section only include data from the post-policy era (from March 09, 2023 to March 08, 2025). In addition, all analyses reflect patients' match post-transplant survival points, which include any approved exception requests and are the scores used in allocation. Finally, both rate analyses included in this section were run with time-varying data, meaning that they account for patients' changing post-transplant survival points during their tenure on the waiting list. As patients' post-transplant survival scores change, they will contribute waiting time to whichever grouping they fall into at that point in time, and an event (transplant or removal for death or too sick) will be attributed to whichever grouping they were in when the event occurred.

In previous continuous distribution monitoring reports, post-transplant survival points were stratified by patients with <20 points and those with 20+ points. The OPTN Lung Transplantation Committee provided feedback that it would be helpful to include more granular stratifications in these analyses to better capture those with particularly high or low post-transplant survival points. As a result, the analyses in this report have been stratified by patients with <18 points, 18-<21 points, and 21+ points. 18 points corresponds with 3.6 years of expected post-transplant survival and 21 points corresponds with 4.2 years of expected post-transplant survival.

The number of deaths or removals for too sick per 100 patient years on the waiting list was greatest for patients with <18 post-transplant survival points. This is likely because PTAUC (which determines patients' post-transplant survival points) is negatively correlated with WLAUC (which determines patients' medical urgency points). Thus, patients with fewer post-transplant survival points tend to be more medically urgent.

Figure 9: Deaths or Removals for Too Sick per 100 Patient Years on the Waiting List by Time-Varying Post-Transplant Survival Points in the Post-Policy Era

Rates were calculated using patients' time−varying post−transplant survival points. This means that as a patient's medical urgency score changes, they will contribute waiting time to whichever grouping they fall into at that point in time.

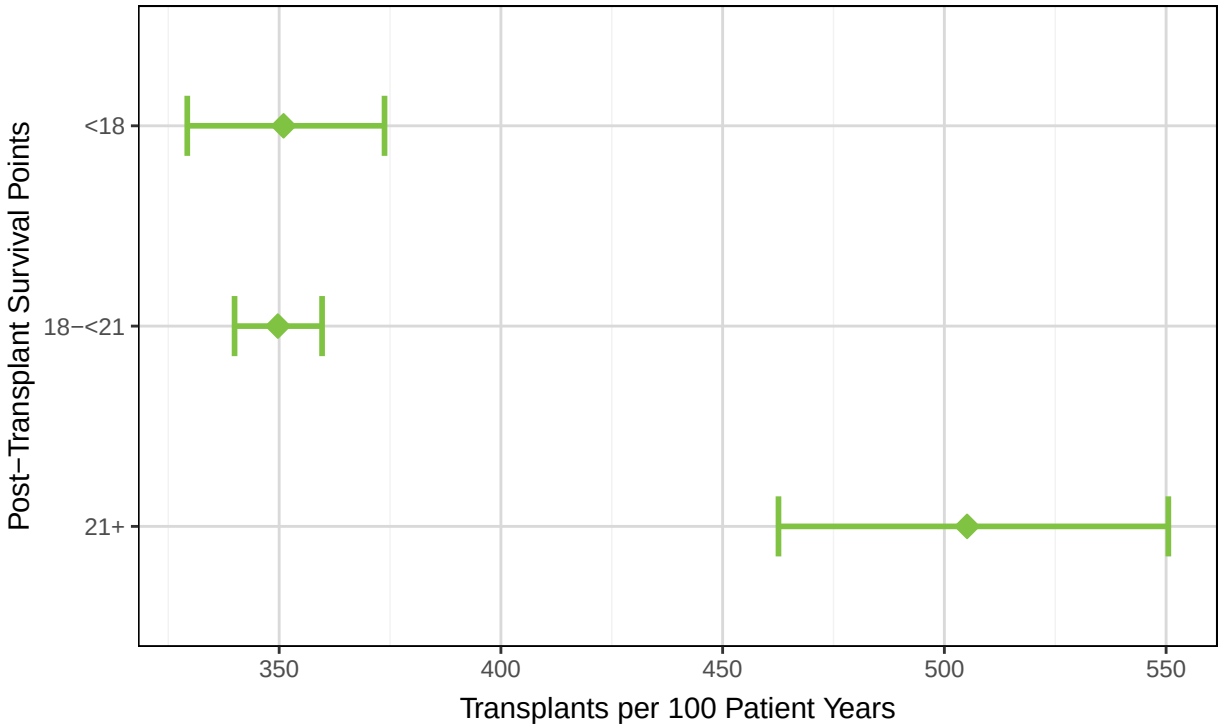
Table 9: Deaths or Removals for Too Sick per 100 Patient Years on the Waiting List by Time-Varying Post-Transplant Survival Points in the Post-Policy Era

Post-Transplant Survival Points	N Patients	Deaths or Removals for Too Sick per 100 Patient Years	95% Confidence Interval
<18	1725	40.40	(33.27, 48.61)
18-<21	6354	13.61	(11.74, 15.69)
21+	706	3.89	(1.06, 9.97)

[a] Rates were calculated using patients' time-varying post-transplant survival points. This means that as a patient's medical urgency score changes, they will contribute waiting time to whichever grouping they fall into at that point in time.

The number of transplants per 100 patient years on the waiting list was greatest for patients with 21 or more post-transplant survival points.

Figure 10: Lung Transplants per 100 Patient Years on the Waiting List by Time-Varying Post-Transplant Survival Points in the Post-Policy Era



Rates were calculated using patients' time−varying post−transplant survival points. This means that as a patient's medical urgency score changes, they will contribute waiting time to whichever grouping they fall into at that point in time.

Table 10: Lung Transplants per 100 Patient Years on the Waiting List by Time-Varying Post-Transplant Survival Points in the Post-Policy Era

Post-Transplant Survival Points	N Patients	Transplants per 100 Patient Years	95% Confidence Interval
<18	1725	350.99	(329.28, 373.76)
18-<21	6354	349.71	(339.94, 359.68)
21+	706	505.12	(462.59, 550.50)

[a] Rates were calculated using patients' time-varying post-transplant survival points. This means that as a patient's medical urgency score changes, they will contribute waiting time to whichever grouping they fall into at that point in time.

Patients with 21 or more post-transplant survival points had the lowest median time to transplant. In addition, patients with less than 18 post-transplant survival points had a slightly lower median time to transplant than patients with 18-<21 post-tranpslant survival points. This is likely because PTAUC (which determines patients' post-transplant survival points) is negatively correlated with WLAUC (which determines patients' medical urgency points). Thus, patients with fewer post-transplant survival points tend to be more medically urgent and thus prioritized in allocation through other CAS attributes.

Figure 11: Median Time to Transplant (Days) by Post-Transplant Survival Points at Listing in the Post-Policy Era

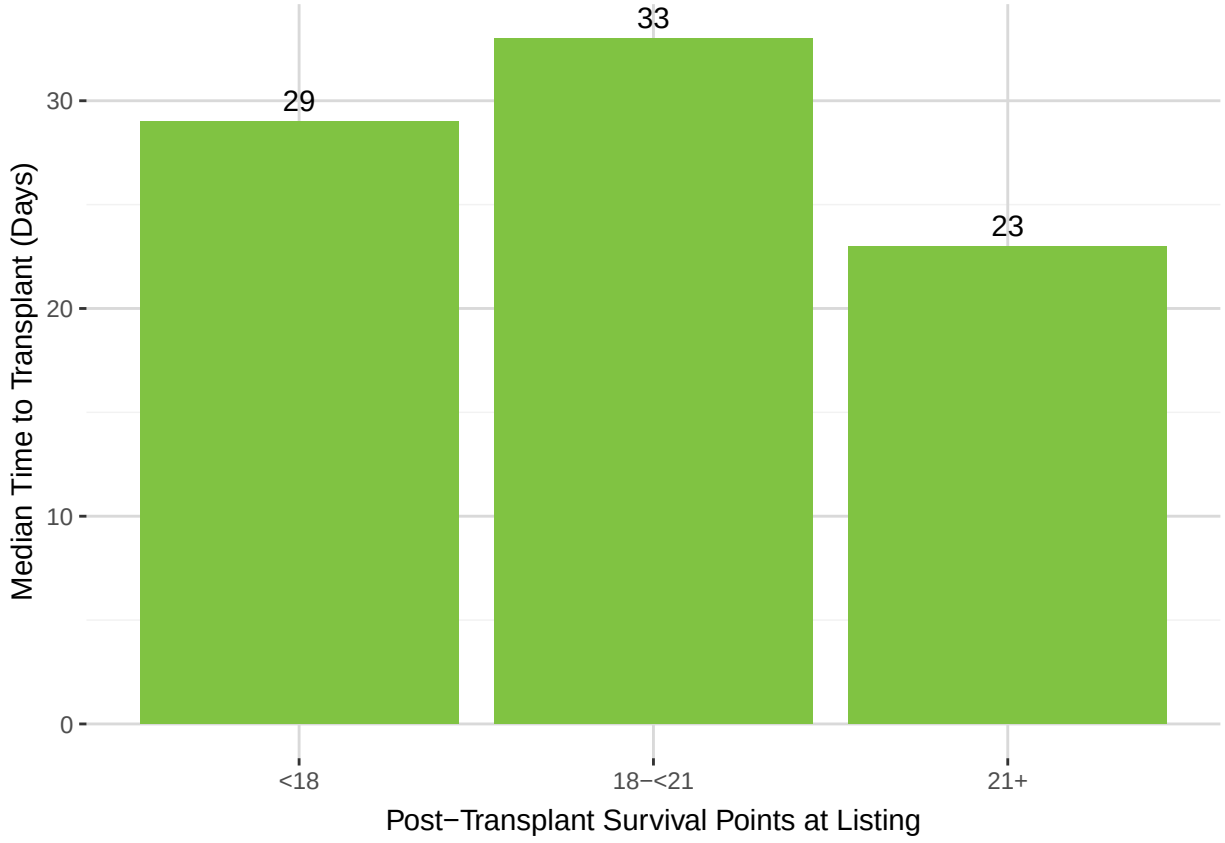
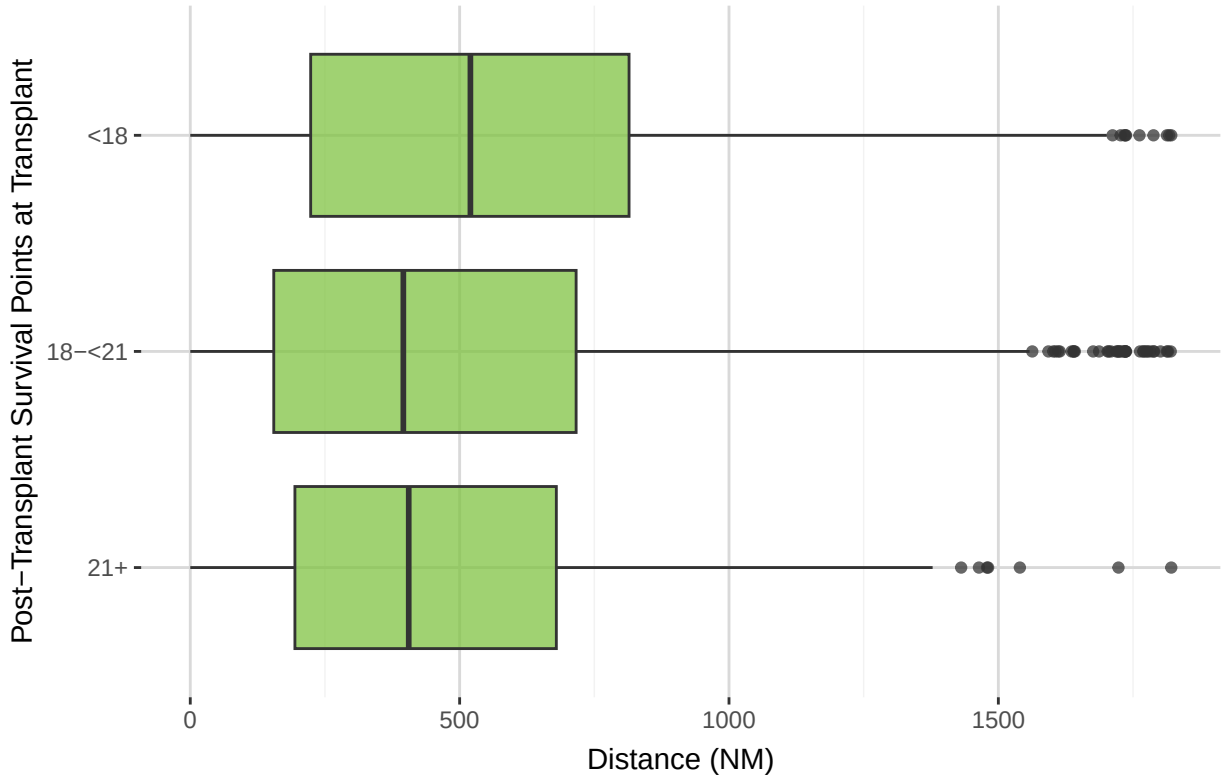


Table 11: Median Time to Transplant (Days) by Post-Transplant Survival Points at Listing in the Post-Policy Era

Post-Transplant Survival Points at Listing	N Registrations	Median Time to Transplant (Days)
<18	1003	29
18-<21	5412	33
21+	478	23

In the post-policy era, median distance for patients with less than 18 post-transplant survival points was greater than the median distance for patients with 18 or more post-transplant survival points.

Figure 12: Distribution of Distance (in Nautical Miles) from Donor Hospital to Transplant Program by Post-Transplant Survival Points at Transplant in the Post-Policy Era



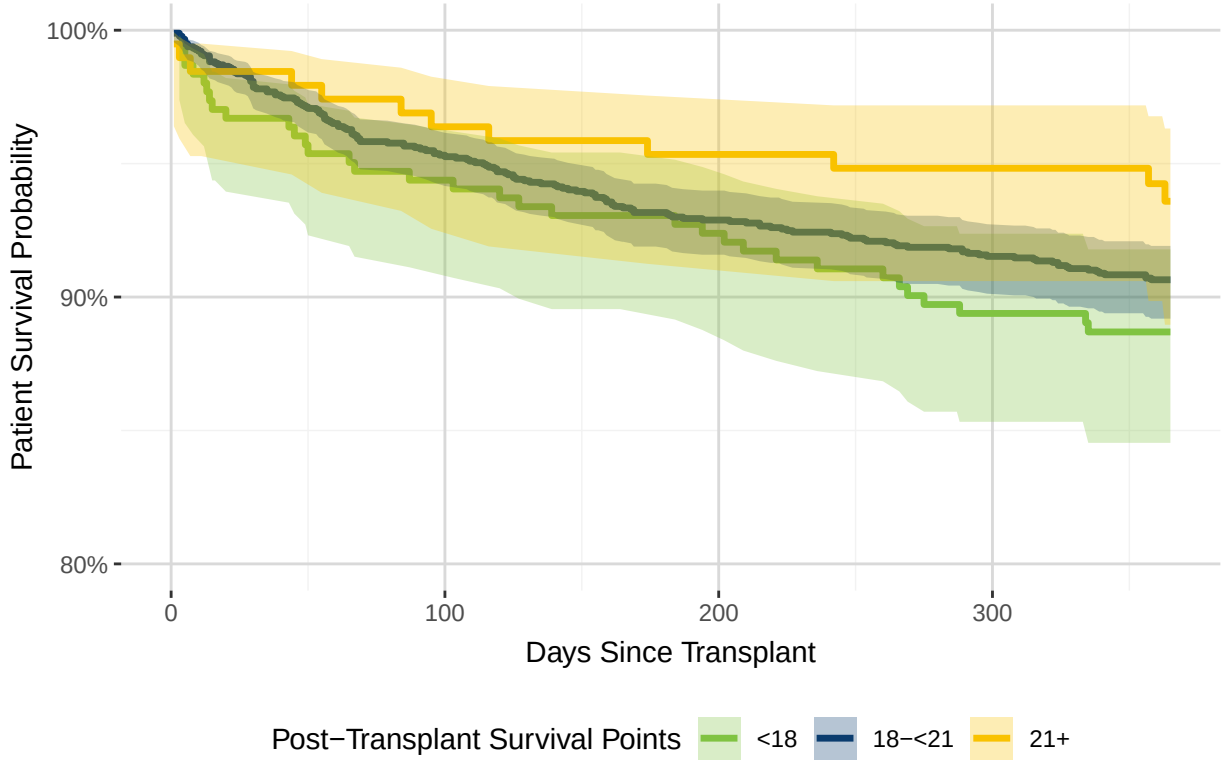
View is restricted to the 99th percentile of distance (1821 NM). There were 66 cases where lungs traveled further than this distance in the post−policy era.

Table 12: Distribution of Distance (in Nautical Miles) from Donor Hospital to Transplant Program by Post-Transplant Survival Points at Transplant in the Post-Policy Era

Post-Transplant Survival Points at Transplant	N	N Missing	Min	25th Percentile	Median	Mean	75th Percentile	Max
<18	974	0	0	225.00	526.0	586.30	830.50	2261
18-<21	4892	0	0	157.75	400.5	484.90	727.25	2920
21+	525	0	0	199.00	414.0	475.72	686.00	2205
Total	6391	0	0	171.00	419.0	499.60	741.00	2920

There were no significant differences in one-year patient post-transplant survival by recipients' post-transplant survival points in the post-policy era; however, survival tended to be slightly higher for patients with more post-transplant survival points.

Figure 13: One-Year Post-Transplant Patient Survival by Post-Transplant Survival Points at Transplant in the Post-Policy Era



In this analysis, the post−policy era includes transplant recipients from March 09, 2023 to December 08, 2023.

Table 13: One-Year Post-Transplant Patient Survival by Post-Transplant Survival Points at Transplant in the Post-Policy Era

Post-Transplant Survival Points	N Patients	N Deaths	1-Year Survival	95% Confidence Interval
<18	303	34	88.7%	(84.5%, 91.8%)
18-<21	1776	165	90.6%	(89.2%, 91.9%)
21+	194	12	93.6%	(89.0%, 96.3%)

[a] In this analysis, the post-policy era includes transplant recipients from March 09, 2023 to December 08, 2023.

Pediatric

Pediatric candidates are defined as those who are less than 18 years old at the time of listing; this includes individuals who turn 18 years old while on the waiting list. The sample sizes for pediatrics are currently too small to definitively determine implications of the policy change; however, below we describe trends we are observing so far. We will continue to monitor pediatrics in upcoming monitoring reports as more data become available.

Although sample sizes were small, the number of deaths or removals for too sick per 100 patient years on the waiting list was similar for pediatric candidates in the pre and post eras.

Figure 14: Deaths or Removals for Too Sick per 100 Patient Years on the Waiting List by Era and Pediatric Age Group

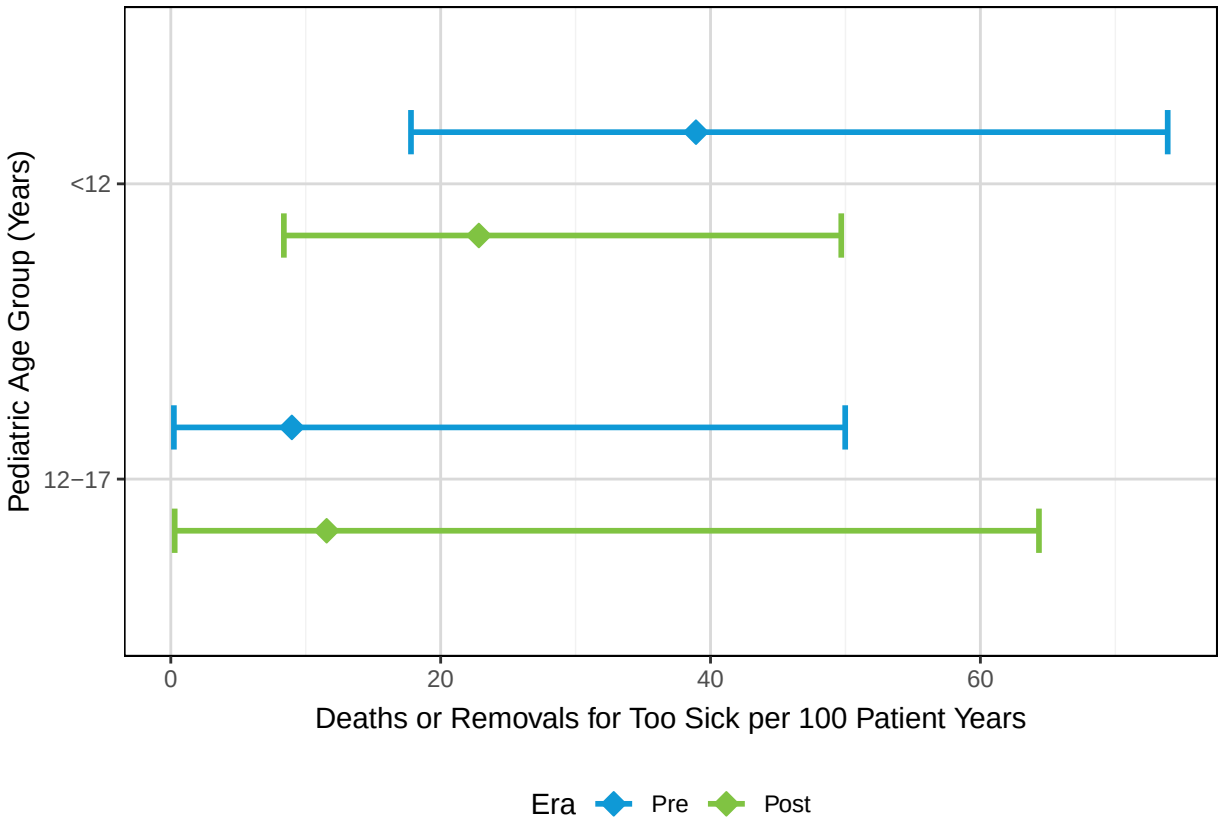


Table 14: Deaths or Removals for Too Sick per 100 Patient Years on the Waiting List by Era and Pediatric Age Group

Pediatric Age Group (Years)	Era	N Patients	Deaths or Removals for Too Sick per 100 Patient Years	95% Confidence Interval
<12	Pre	48	38.92	(17.80, 73.88)
	Post	47	22.83	(8.38, 49.69)
12-17	Pre	40	8.97	(0.23, 49.98)
	Post	40	11.55	(0.29, 64.34)

Although sample sizes were small, the number of lung transplants per 100 patient years increased slightly for pediatric candidates between 12-17 years in the post era. The number of transplants per 100 patient years for candidates <12 years remained similar across the policy eras.

Figure 15: Lung Transplants per 100 Patient Years on the Waiting List by Era and Pediatric Age Group

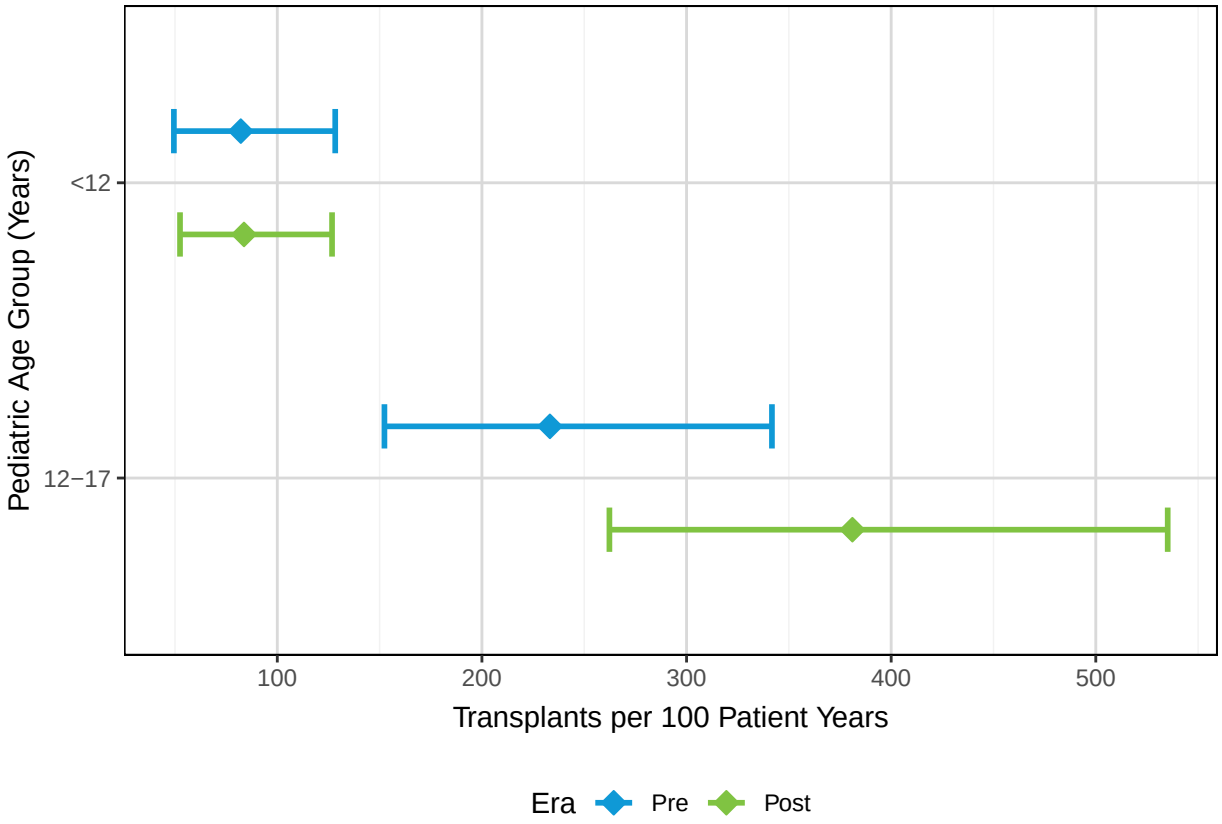


Table 15: Lung Transplants per 100 Patient Years on the Waiting List by Era and Pediatric Age Group

Pediatric Age Group (Years)	Era	N Patients	Transplants per 100 Patient Years	95% Confidence Interval
<12	Pre	48	82.16	(49.46, 128.30)
	Post	47	83.72	(52.46, 126.75)
12-17	Pre	40	233.23	(152.35, 341.73)
	Post	40	381.05	(262.30, 535.14)

In the post era, the number of pediatric lungs transplanted to adult recipients increased slightly and the number transplanted to pediatric recipients decreased slightly. In addition, more adult lungs were transplanted to pediatric recipients in the post era compared to the pre era.

Figure 16: Number of Lung Transplants by Era, Recipient Age Group, and Donor Age Group

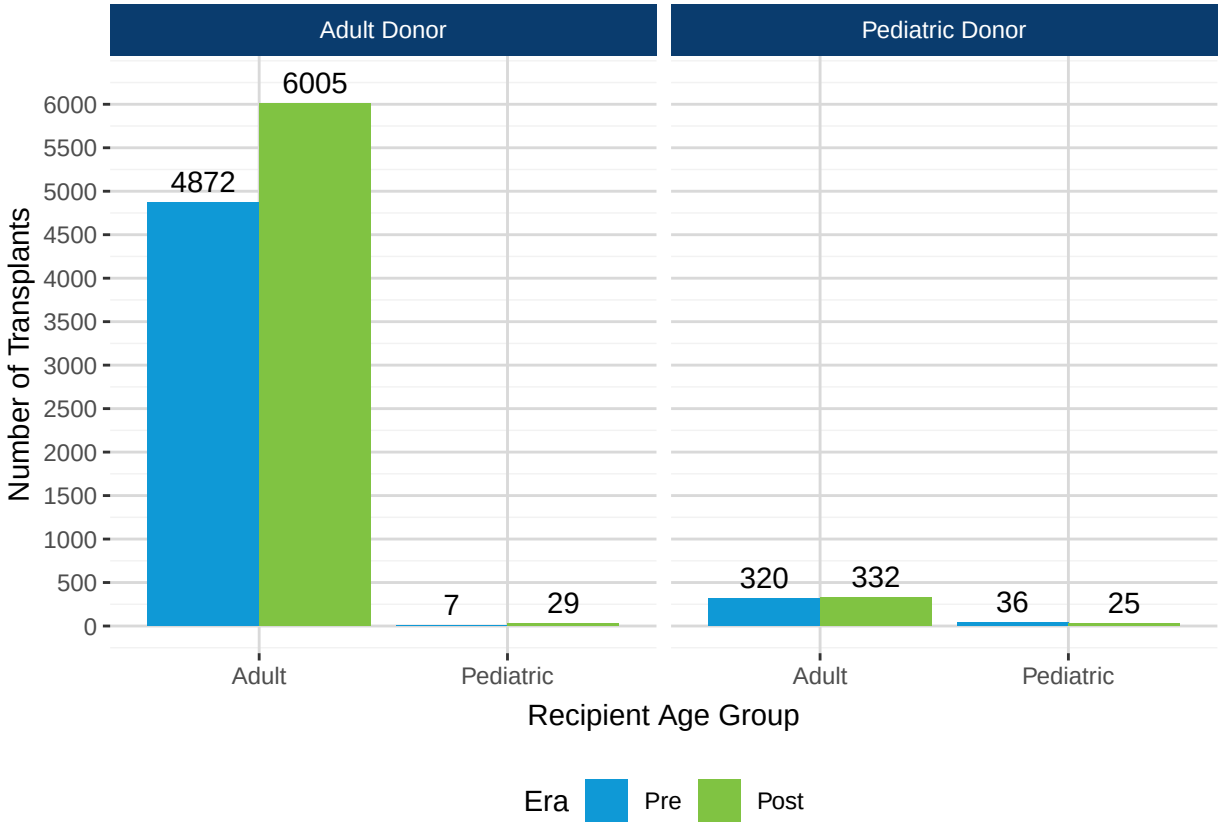


Table 16: Number of Lung Transplants by Era, Recipient Age Group, and Donor Age Group

Era	Recipient Age Group	Adult Donor	Pediatric Donor
Pre	Adult	4872 (99.9%)	320 (89.9%)
	Pediatric	7 (0.1%)	36 (10.1%)
	Total	4879 (100.0%)	356 (100.0%)
Post	Adult	6005 (99.5%)	332 (93.0%)
	Pediatric	29 (0.5%)	25 (7.0%)
	Total	6034 (100.0%)	357 (100.0%)

Continuous distribution provides more opportunities for organ sharing between age groups compared to the previous allocation system. The goal of this increased sharing across age groups is that pediatric candidates will have priority for all organs, and while not explicitly outlined in policy, the intent is that short adult candidates will have access to pediatric organs. The following figure and table describe the difference in height between donors and recipients across age groups. Negative height differences mean that the recipient was shorter than the donor and positive height differences mean that the recipient was taller than the donor. In the post-policy era there was a smaller height difference between donors <12 years old and adult recipients compared to the pre-policy era. In addition, adults who received lungs from 12-17 year old donors were typically a close height match to the donor.

Figure 17: Distribution of the Difference Between Recipient Height and Donor Height by Era, Donor Age Group, and Recipient Age Group

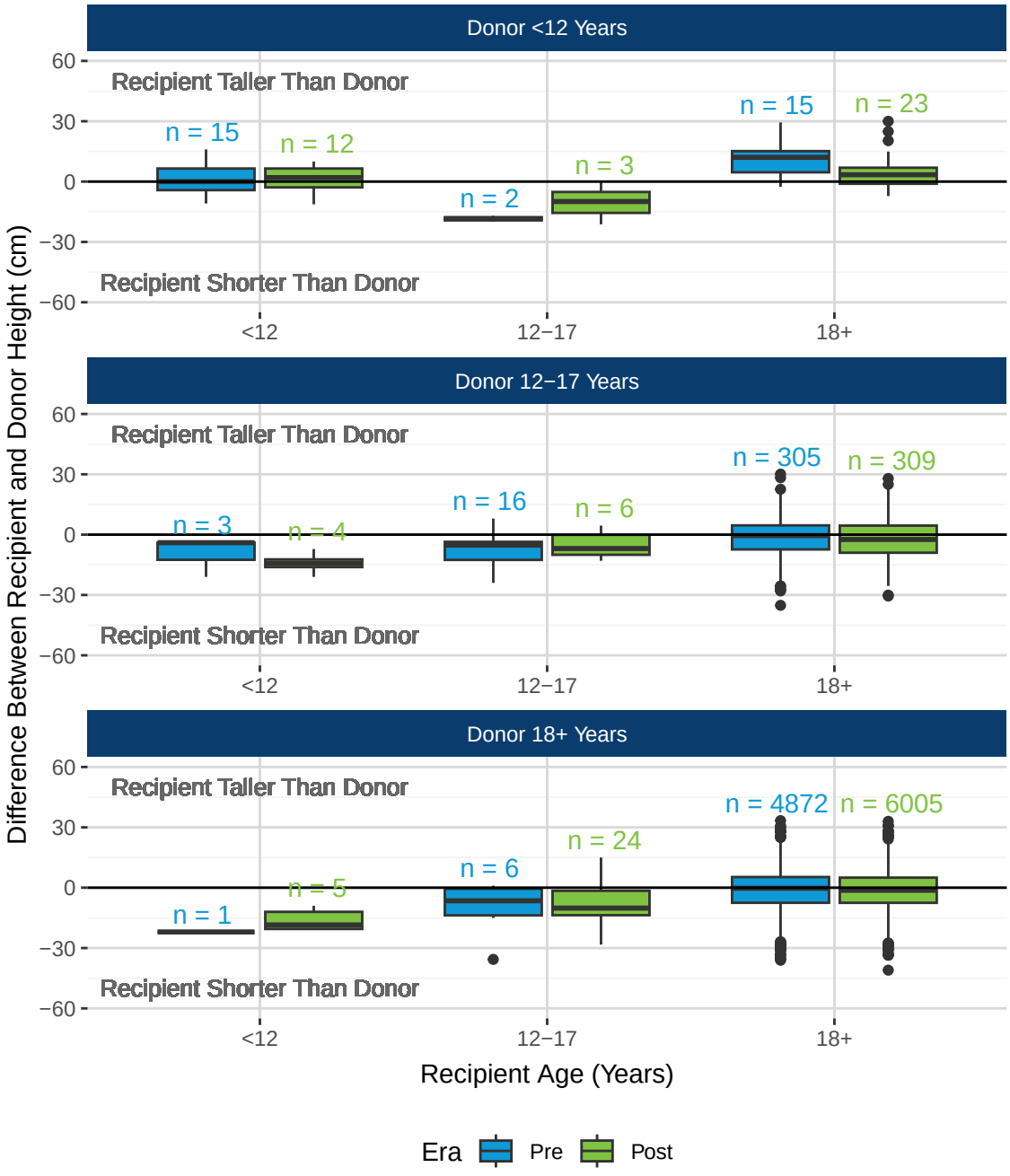


Table 17: Distribution of Recipient Height, Donor Height, and Recipient-Donor Height Difference by Era, Donor Age Group, and Recipient Age Group

Donor Age (Years)	Recipient Age (Years)	Height Metric	Era	N	N Missing	Min	25th Percentile	Median	Mean	75th Percentile	Max
<12	<12	Donor Height	Pre	15	0	55.00	72.60	89.00	93.08	111.50	139.00
			Post	12	0	61.00	83.75	113.00	104.69	123.75	140.00
		Recipient Height	Pre	15	0	63.50	66.40	85.00	93.79	116.75	139.00
			Post	12	0	69.00	87.07	111.50	105.50	125.38	133.00
		Height Difference	Pre	15	0	-10.90	-4.25	0.00	0.71	6.50	16.00
			Post	12	0	-11.30	-2.88	1.98	0.81	6.50	10.00
	12-17	Donor Height	Pre	2	0	150.00	153.75	157.50	157.50	161.25	165.00
			Post	3	0	140.00	141.12	142.24	142.75	144.12	146.00
		Recipient Height	Pre	2	0	133.00	136.00	139.00	139.00	142.01	145.01
			Post	3	0	121.00	125.55	130.10	132.23	137.85	145.60
		Height Difference	Pre	2	0	-19.99	-19.24	-18.50	-18.50	-17.75	-17.00
			Post	3	0	-21.24	-15.57	-9.90	-10.51	-5.15	-0.40
	18+	Donor Height	Pre	15	0	123.00	135.00	145.00	144.20	152.00	165.00
			Post	23	0	127.00	142.00	150.00	148.57	153.47	165.00
		Recipient Height	Pre	15	0	142.24	149.80	154.00	154.77	162.56	165.10
			Post	23	0	140.00	149.91	152.40	153.82	157.24	170.18
		Height Difference	Pre	15	0	-2.60	4.62	12.06	10.57	15.15	29.40
			Post	23	0	-7.20	-1.07	3.40	5.25	6.90	30.00

(Continued)

Donor Age (Years)	Recipient Age (Years)	Height Metric	Era	N	N Missing	Min	25th Percentile	Median	Mean	75th Percentile	Max
12-17	<12	Donor Height	Pre	3	0	147.00	152.00	157.00	156.33	161.00	165.00
			Post	4	0	139.00	147.53	155.18	152.84	160.50	162.00
		Recipient Height	Pre	3	0	143.00	143.50	144.00	146.67	148.50	153.00
			Post	4	0	124.50	136.88	142.10	138.68	143.90	146.00
		Height Difference	Pre	3	0	-21.00	-12.50	-4.00	-9.67	-4.00	-4.00
			Post	4	0	-21.00	-16.12	-14.25	-14.17	-12.29	-7.17
	12-17	Donor Height	Pre	16	0	142.00	166.00	169.00	167.84	173.50	183.00
			Post	6	0	147.00	152.00	153.50	155.17	158.75	165.00
		Recipient Height	Pre	16	0	132.08	154.28	160.45	160.29	167.16	183.20
			Post	6	0	142.00	143.65	148.10	149.96	153.23	164.49
		Height Difference	Pre	16	0	-24.00	-12.56	-5.23	-7.55	-3.58	8.00
			Post	6	0	-13.00	-10.02	-6.90	-5.20	-0.10	4.49
	18+	Donor Height	Pre	305	0	140.00	163.00	171.45	170.29	178.00	191.00
			Post	309	0	145.50	165.00	170.00	170.56	178.00	195.00
		Recipient Height	Pre	305	0	139.70	161.50	170.00	168.79	176.50	195.00
			Post	309	0	139.70	160.40	167.64	168.28	175.30	198.10
		Height Difference	Pre	305	0	-35.14	-7.36	-0.44	-1.49	4.60	30.10
			Post	309	0	-30.52	-9.00	-2.40	-2.28	4.50	27.94

(Continued)

Donor Age (Years)	Recipient Age (Years)	Height Metric	Era	N	N Missing	Min	25th Percentile	Median	Mean	75th Percentile	Max
18+	<12	Donor Height	Pre	1	0	163.00	163.00	163.00	163.00	163.00	163.00
			Post	5	0	155.00	155.00	156.00	158.80	160.02	168.00
		Recipient Height	Pre	1	0	141.00	141.00	141.00	141.00	141.00	141.00
			Post	5	0	134.00	139.50	144.00	142.60	146.00	149.50
		Height Difference	Pre	1	0	-22.00	-22.00	-22.00	-22.00	-22.00	-22.00
			Post	5	0	-21.00	-20.52	-18.50	-16.20	-12.00	-9.00
	12-17	Donor Height	Pre	6	0	152.00	164.16	168.82	168.77	177.50	180.00
			Post	24	0	150.00	162.25	168.00	168.05	173.50	193.04
		Recipient Height	Pre	6	0	132.00	153.00	159.00	158.38	166.50	180.30
			Post	24	0	127.00	151.12	159.51	159.40	167.16	180.34
		Height Difference	Pre	6	0	-35.64	-13.75	-6.50	-10.39	-0.52	1.00
			Post	24	0	-28.30	-13.67	-10.15	-8.65	-1.56	15.00
	18+	Donor Height	Pre	4872	0	127.00	165.00	170.18	171.10	178.00	206.00
			Post	6005	0	130.00	164.00	170.50	170.94	178.00	201.00
		Recipient Height	Pre	4872	0	124.46	162.56	170.18	170.21	177.80	203.20
			Post	6005	0	134.62	162.56	170.18	169.68	177.80	203.20
		Height Difference	Pre	4872	0	-36.06	-7.50	-0.28	-0.89	5.30	33.34
			Post	6005	0	-41.00	-7.52	-1.27	-1.26	5.01	32.99

[a] Negative height differences mean that the recipient was shorter than the donor and positive height differences mean that the recipient was taller than the donor.

The following figure and table describe the distribution of donor age for pediatric recipients. The median donor age increased in the post era for both <12 and 12-17 year old recipients.

Figure 18: Distribution of Donor Age by Era and Pediatric Age Group

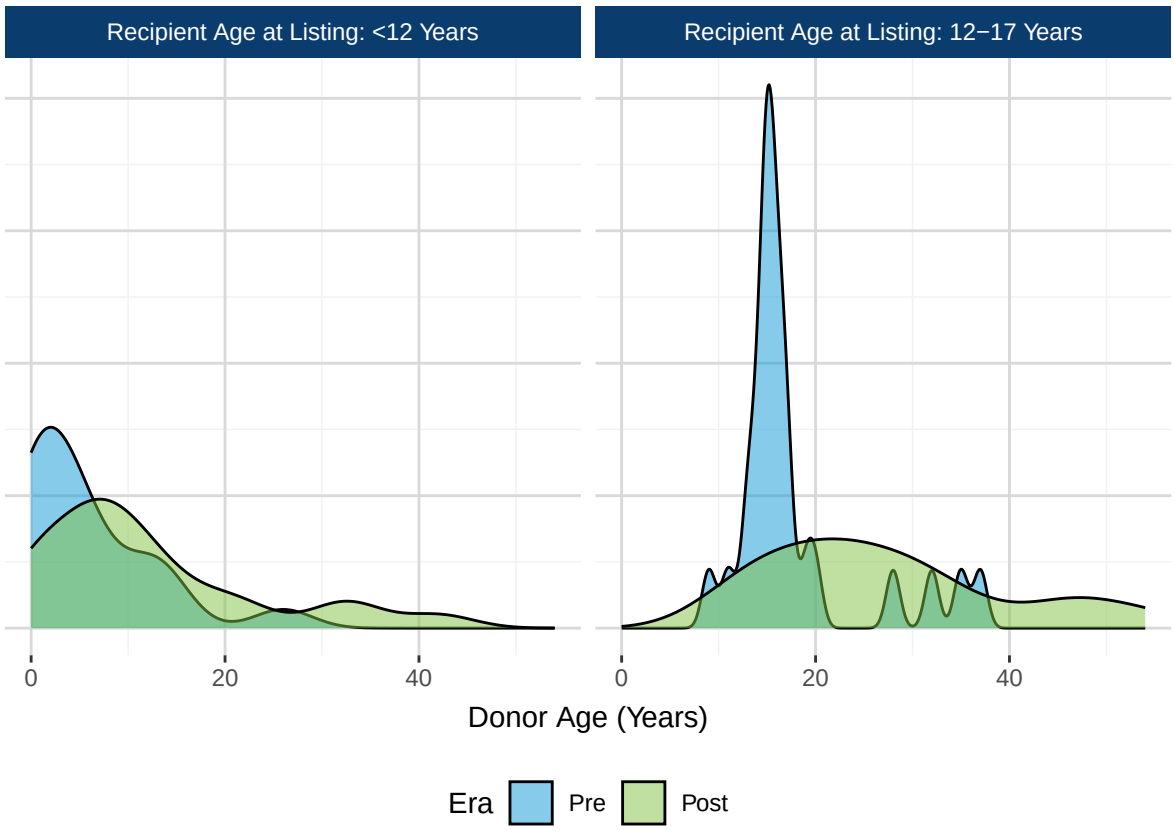
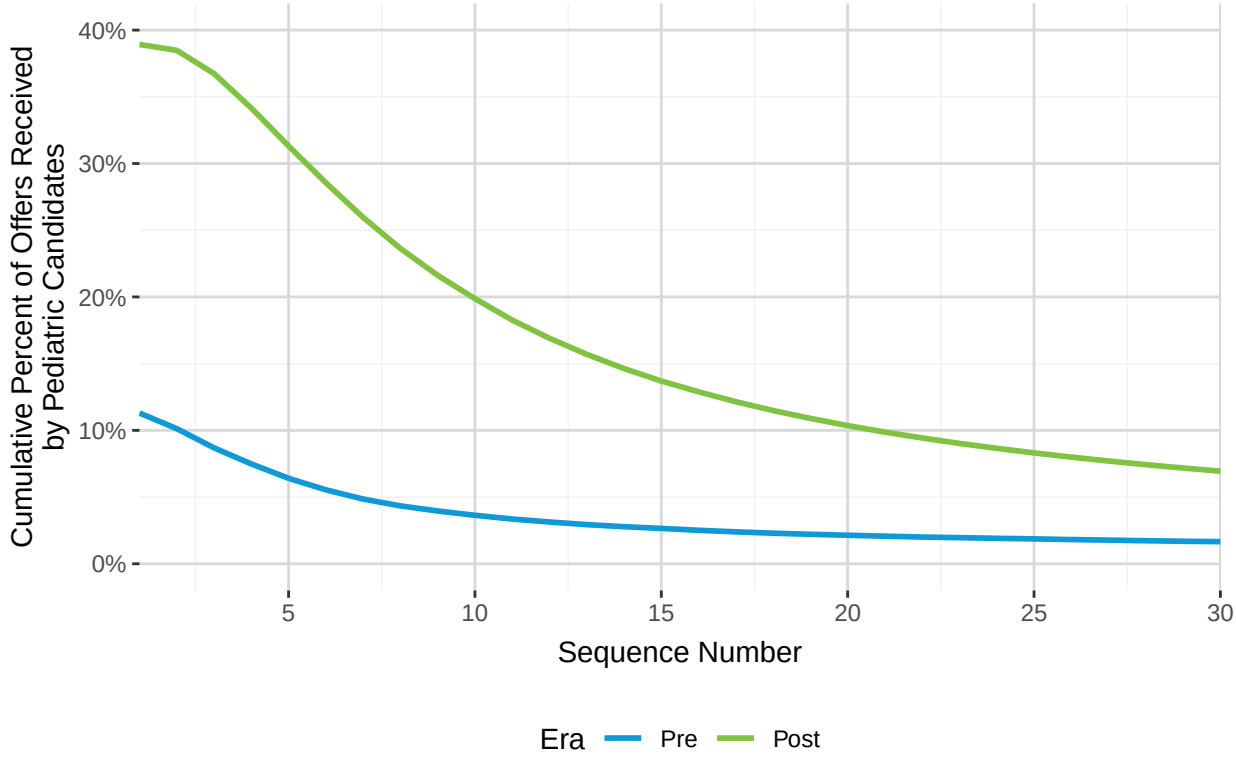


Table 18: Distribution of Donor Age by Era and Pediatric Age Group

Recipient Age at Listing (Years)	Era	N	N Missing	Min	25th Percentile	Median	Mean	75th Percentile	Max
<12	Pre	19	0	0	0.50	4.0	5.79	8.50	26
	Post	22	0	0	5.25	8.0	12.00	15.25	42
12-17	Pre	26	0	9	15.00	15.5	17.88	17.00	37
	Post	34	0	10	18.25	24.0	27.18	32.50	54
Total	Pre	45	0	0	5.00	14.0	12.78	16.00	37
	Post	56	0	0	10.75	19.5	21.21	30.00	54

The following figure and table describe how pediatric candidates were ranked on match runs in the pre- and post-policy eras by depicting the cumulative percent of offers received by pediatric candidates at the top of the match run (from sequence numbers 1 to 30). In the post era, pediatric candidates had greater access to transplants and received the first offer on a match run 39% of the time, compared to the pre era where they received the first offer on a match run only 11% of the time.

Figure 19: Cumulative Percent of Offers Received by Pediatric Candidates by Era and Sequence Number



View is restricted to match run sequence numbers 1 through 30 to highlight differences at the top of the match run between the pre and post eras.

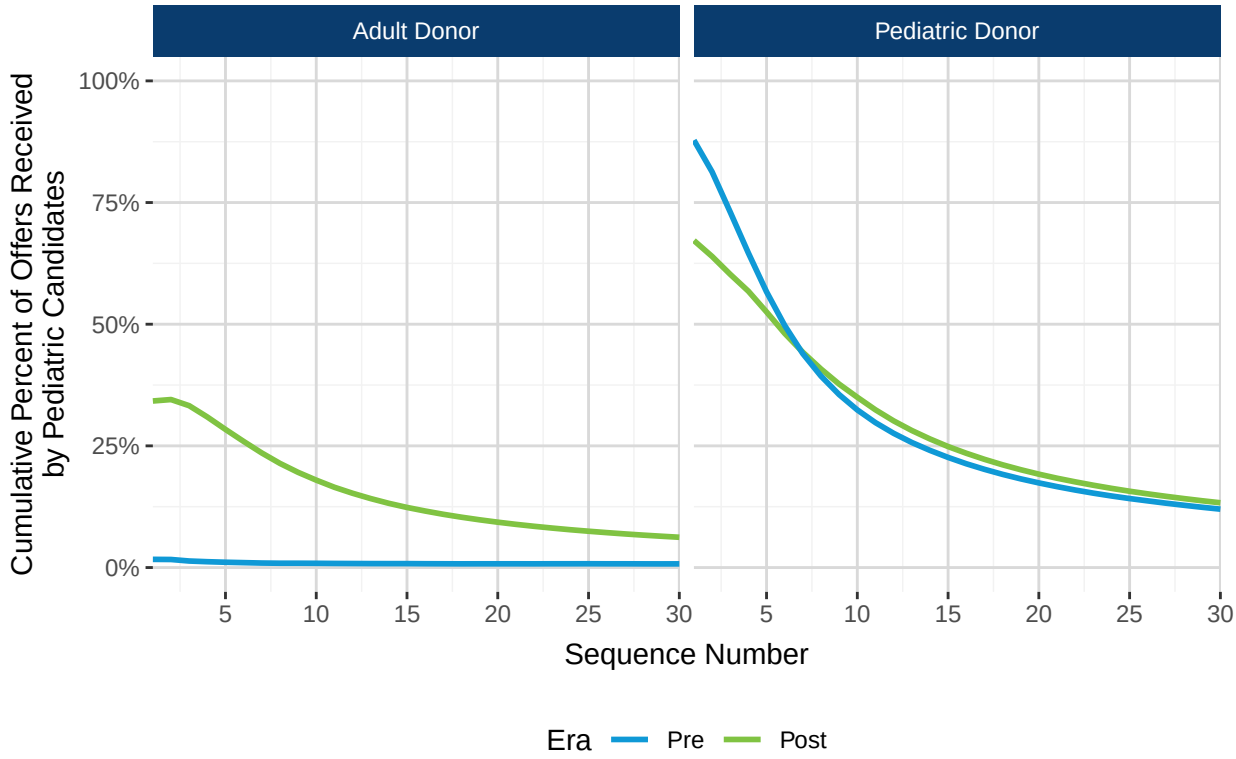
Table 19: Cumulative Percent of Offers Received by Pediatric Candidates by Era and Sequence Number

Sequence Number	Pre	Post
1	11.298%	38.923%
2	10.126%	38.481%
3	8.686%	36.738%
4	7.484%	34.156%
5	6.406%	31.314%
6	5.544%	28.556%
7	4.851%	25.961%
8	4.339%	23.632%
9	3.958%	21.618%
10	3.635%	19.870%
11	3.354%	18.265%
12	3.132%	16.900%
13	2.936%	15.698%
14	2.779%	14.631%
15	2.648%	13.699%
16	2.510%	12.889%
17	2.392%	12.145%
18	2.292%	11.487%
19	2.212%	10.895%
20	2.140%	10.358%
21	2.069%	9.870%
22	2.004%	9.429%
23	1.957%	9.023%
24	1.909%	8.652%
25	1.865%	8.310%
26	1.816%	7.995%
27	1.773%	7.702%
28	1.727%	7.431%
29	1.687%	7.178%
30	1.657%	6.942%

[a] Cumulative percent of offers received by pediatric candidates are only listed through match run sequence number 30 to highlight differences in pediatric offers at the top of the match run in the pre and post eras.

The following figure and table describe how pediatric candidates were ranked on match runs in the pre- and post-policy eras for both pediatric and adult donors by depicting the cumulative percent of offers received by pediatric candidates at the top of the match run (from sequence numbers 1 to 30). In the post era, pediatric candidates were slightly less likely to appear in the top 5 sequence numbers for pediatric donors compared to the pre era. However, they were more likely to appear at the top of the match run for adult donors in the post era compared to the pre era. This is likely explained by the fact that pediatric candidates are no longer given explicit priority to pediatric donors under continuous distribution. Instead, they are given 20 allocation points which increases their priority overall. However, they may still appear below very medically urgent adult candidates on both adult and pediatric donor match runs.

Figure 20: Cumulative Percent of Offers Received by Pediatric Candidates by Era, Donor Age Group, and Sequence Number



View is restricted to match run sequence numbers 1 through 30 to highlight differences at the top of the match run between the pre and post eras.

Table 20: Cumulative Percent of Offers Received by Pediatric Candidates by Era, Donor Age Group, and Sequence Number

	Adult Donors		Pediatric Donors	
Sequence Number	Pre	Post	Pre	Post
1	1.679%	34.221%	87.808%	67.194%
2	1.651%	34.517%	81.303%	63.924%
3	1.338%	33.257%	73.042%	60.252%
4	1.200%	30.934%	64.620%	56.780%
5	1.088%	28.383%	56.655%	52.521%
6	1.004%	25.915%	49.734%	48.114%
7	0.923%	23.542%	43.943%	44.236%
8	0.885%	21.400%	39.334%	40.790%
9	0.886%	19.560%	35.536%	37.685%
10	0.871%	17.959%	32.384%	34.988%
11	0.841%	16.496%	29.775%	32.409%
12	0.827%	15.261%	27.582%	30.139%
13	0.807%	14.168%	25.698%	28.162%
14	0.802%	13.194%	24.076%	26.426%
15	0.805%	12.350%	22.625%	24.855%
16	0.783%	11.615%	21.331%	23.487%
17	0.768%	10.940%	20.181%	22.237%
18	0.760%	10.343%	19.149%	21.112%
19	0.763%	9.806%	18.221%	20.102%
20	0.766%	9.319%	17.391%	19.187%
21	0.762%	8.876%	16.626%	18.354%
22	0.758%	8.474%	15.926%	17.608%
23	0.768%	8.106%	15.283%	16.913%
24	0.771%	7.770%	14.703%	16.272%
25	0.773%	7.460%	14.175%	15.682%
26	0.766%	7.174%	13.694%	15.138%
27	0.763%	6.909%	13.224%	14.634%
28	0.754%	6.663%	12.792%	14.162%
29	0.749%	6.434%	12.383%	13.720%
30	0.751%	6.220%	11.999%	13.306%

[a] Cumulative percent of offers received by pediatric candidates are only listed through match run sequence number 30 to highlight differences in pediatric offers at the top of the match run in the pre and post eras.

In the post-policy era, median distance from the donor hospital to transplant program increased for pediatric recipients from 349.0 NM to 518.5 NM, though sample sizes were small.

Figure 21: Distribution of Distance (in Nautical Miles) from Donor Hospital to Transplant Program for Pediatric Recipients by Era

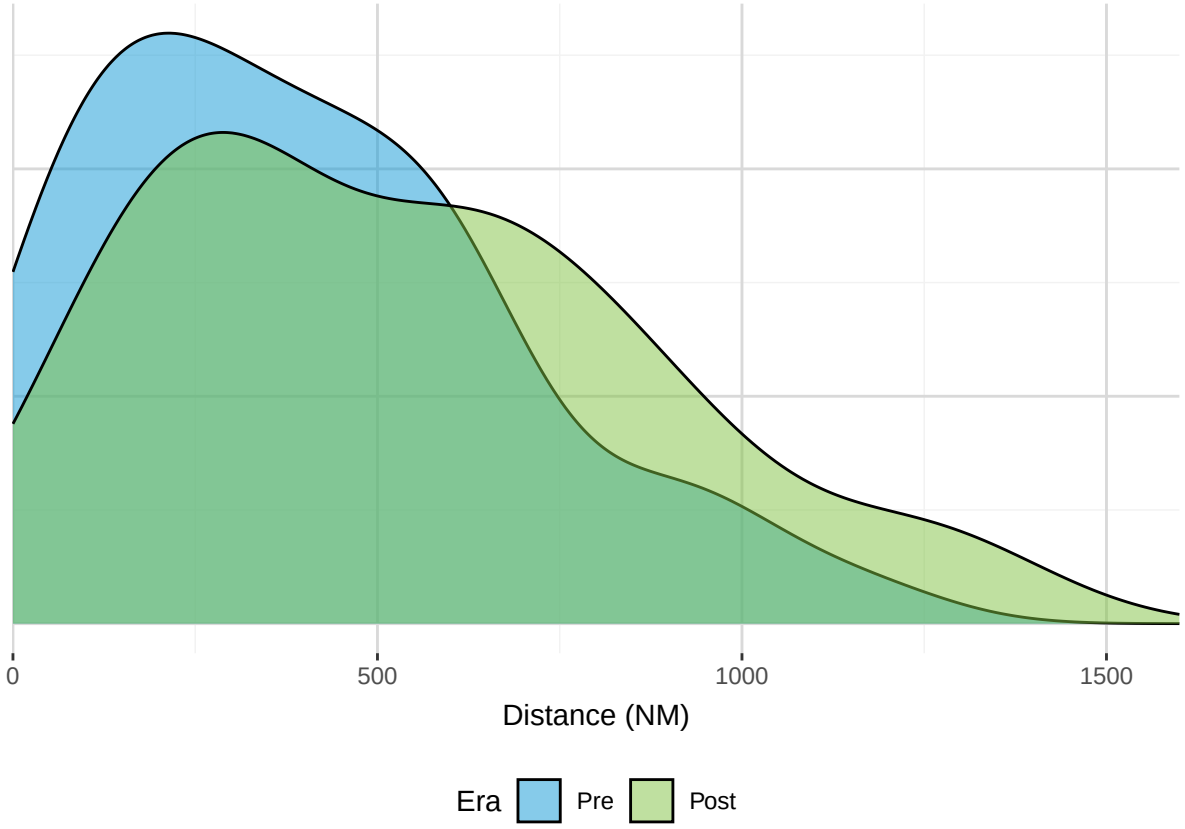
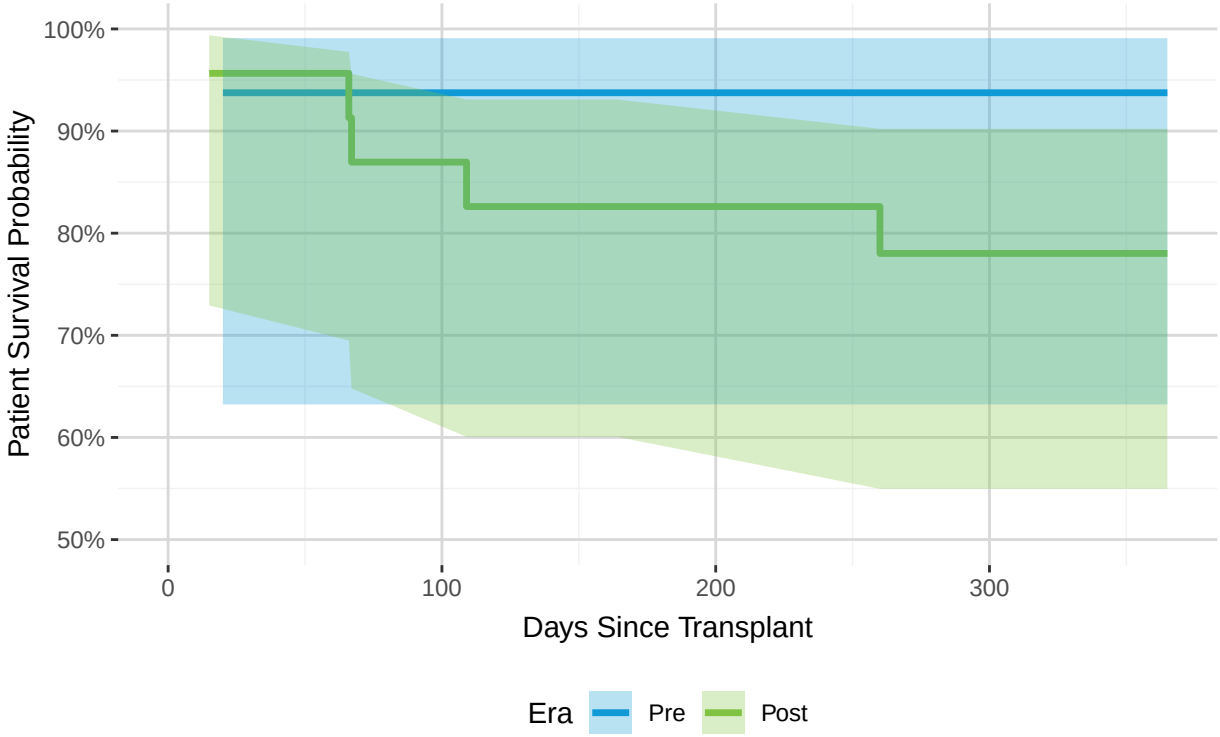


Table 21: Distribution of Distance (in Nautical Miles) from Donor Hospital to Transplant Program for Pediatric Recipients by Era

Era	N	N Missing	Min	25th Percentile	Median	Mean	75th Percentile	Max
Pre	45	0	0	197.0	349.0	394.44	571.00	1169
Post	56	0	3	268.5	518.5	535.50	745.25	1384

There was no statistically significant change in one-year post-transplant survival for pediatric recipients; however, the sample sizes were small and the confidence intervals were large. One patient death within one year of transplant was reported in the pre-policy era. This single death in the pre era resulted in a straight-line survival curve. The sample size was not large enough to further stratify this analysis by pediatric age groups <12 years and 12-17 years.

Figure 22: One-Year Post-Transplant Patient Survival by Era for Pediatric Recipients



In this analysis, the pre−policy era includes transplant recipients from June 09, 2022 to March 08, 2023 and the post−policy era includes transplant recipients from March 09, 2023 to December 08, 2023.

Table 22: One-Year Post-Transplant Patient Survival by Era for Pediatric Recipients

Age (Years)	Era	N Patients	N Deaths	1-Year Survival	95% Confidence Interval
0-17	Pre	16	1	93.8%	(63.2%, 99.1%)
	Post	23	5	78.0%	(55.0%, 90.2%)

[a] In this analysis, the pre-policy era includes transplant recipients from June 09, 2022 to March 08, 2023 and the post-policy era includes transplant recipients from March 09, 2023 to December 08, 2023.

The pediatric lung utilization rate increased slightly for both DCD and non-DCD pediatric donors. The pediatric utilization rate is defined as the percent of pediatric lungs that are transplanted based on all possible lungs from every deceased pediatric donor with at least one organ recovered for the purpose of transplant; this definition assumes that each donor has two possible lungs for donation.

Figure 23: Pediatric Lung Donor Utilization Rates by Era and Donor Type

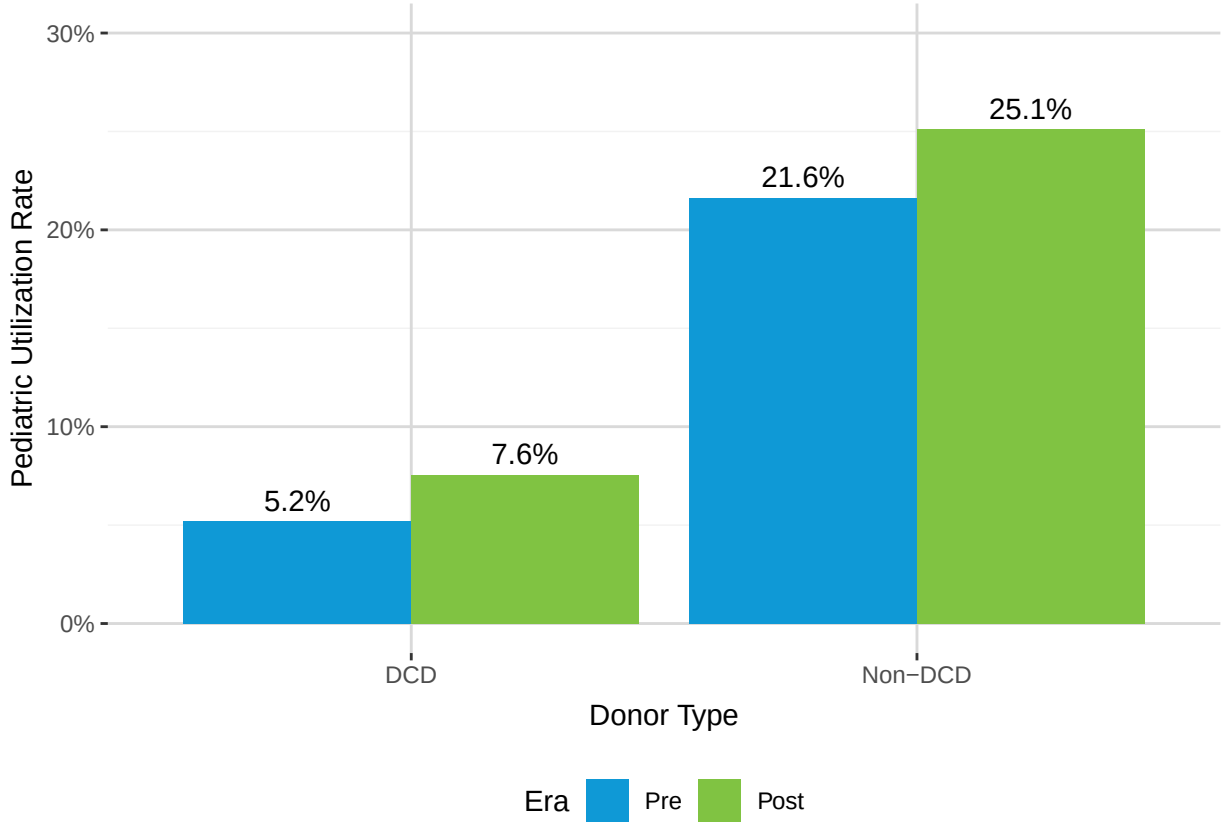


Table 23: Pediatric Lung Donor Utilization Rates by Era and Donor Type

DCD Status	Era	N Donors	N Lungs Transplanted	Pediatric Utilization Rate
DCD	Pre	442	46	5.2%
	Post	509	77	7.6%
Non-DCD	Pre	1451	628	21.6%
	Post	1241	623	25.1%
All Pediatric Donors	Pre	1893	674	17.8%
	Post	1750	700	20.0%

The pediatric lung non-use rate increased slightly for DCD donors in the post era. The pediatric non-use rate is defined as the percent of pediatric lungs recovered for the purpose of transplant but not transplanted out of all pediatric lungs recovered for transplant.

Figure 24: Pediatric Lung Donor Non-Use Rates by Era and Donor Type

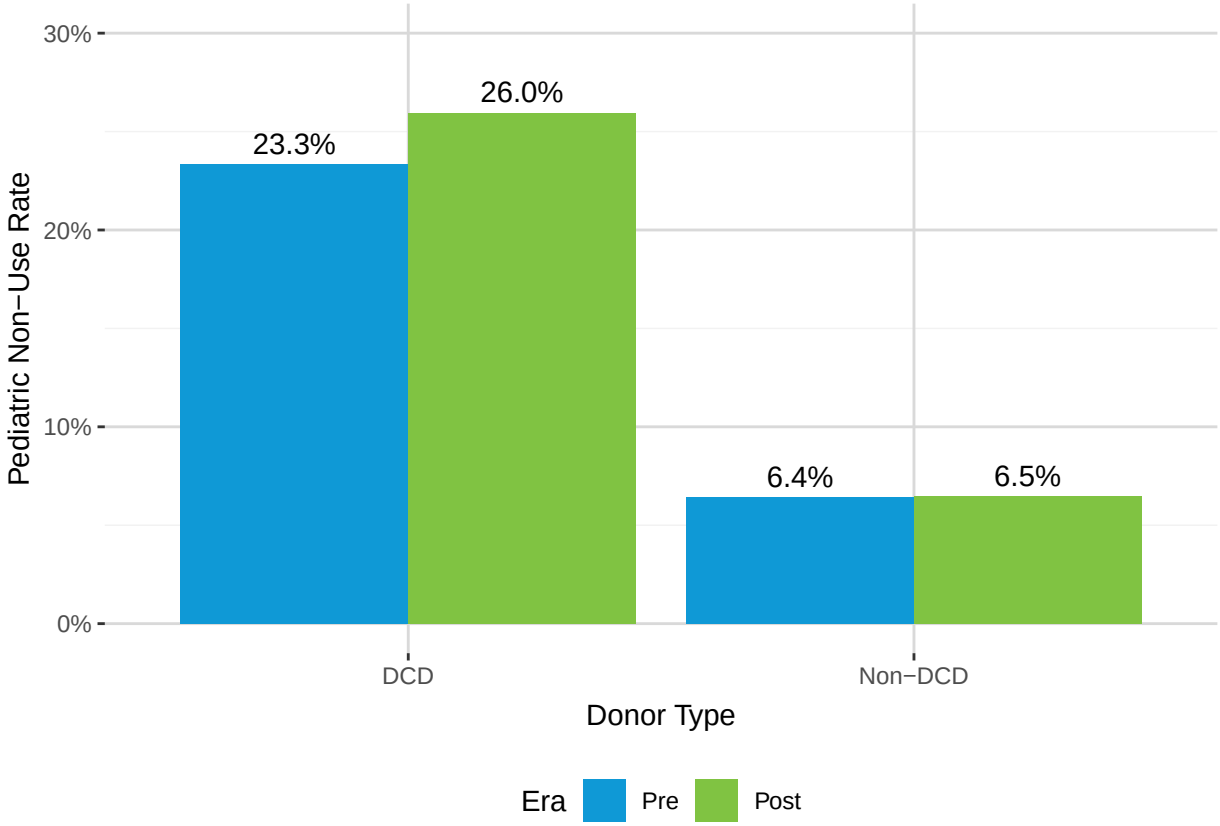


Table 24: Pediatric Lung Donor Non-Use Rates by Era and Donor Type

DCD Status	Era	N Lungs Recovered	N Lungs Transplanted	Pediatric Non-Use Rate
DCD	Pre	60	46	23.3%
	Post	104	77	26.0%
Non-DCD	Pre	671	628	6.4%
	Post	666	623	6.5%
All Pediatric Donors	Pre	731	674	7.8%
	Post	770	700	9.1%

Prior Living Donor

In the first two years after the implementation of lung continuous distribution less than 10 prior living donors were listed for a lung transplant and all of these candidates were transplanted. Because of the small number of patients and to protect patient privacy, we cannot provide any additional information about these individuals. We will continue to monitor the prior living donor population and will include more information when it is available.

Blood Type

On September 27th, 2023 the OPTN Lung Transplantation Committee modified how blood type is incorporated into lung continuous distribution (CD) allocation to provide more proportional access to lung transplantation for candidates of all blood types and to improve access to lung transplantation for blood type O candidates. As a result of this change, this section of the report compares blood type data across three eras: before CD implementation (Blood Type: Pre-CD; March 09, 2021 - March 08, 2023), after CD implementation with the original blood type rating scale (Blood Type: Post-CD; March 09, 2023 - September 26, 2023), and after CD implementation with the modified blood type rating scale (Blood Type: Post-CD + ABO Mod; September 27, 2023 - March 08, 2025).

Compared to the Pre-CD era, the number of deaths or removals for too sick per 100 patient years remained similar or decreased slightly under the Post-CD and Post-CD + ABO Modification eras for candidates of all blood types.

Figure 25: Deaths or Removals for Too Sick per 100 Patient Years on the Waiting List by Era and Candidate Blood Type

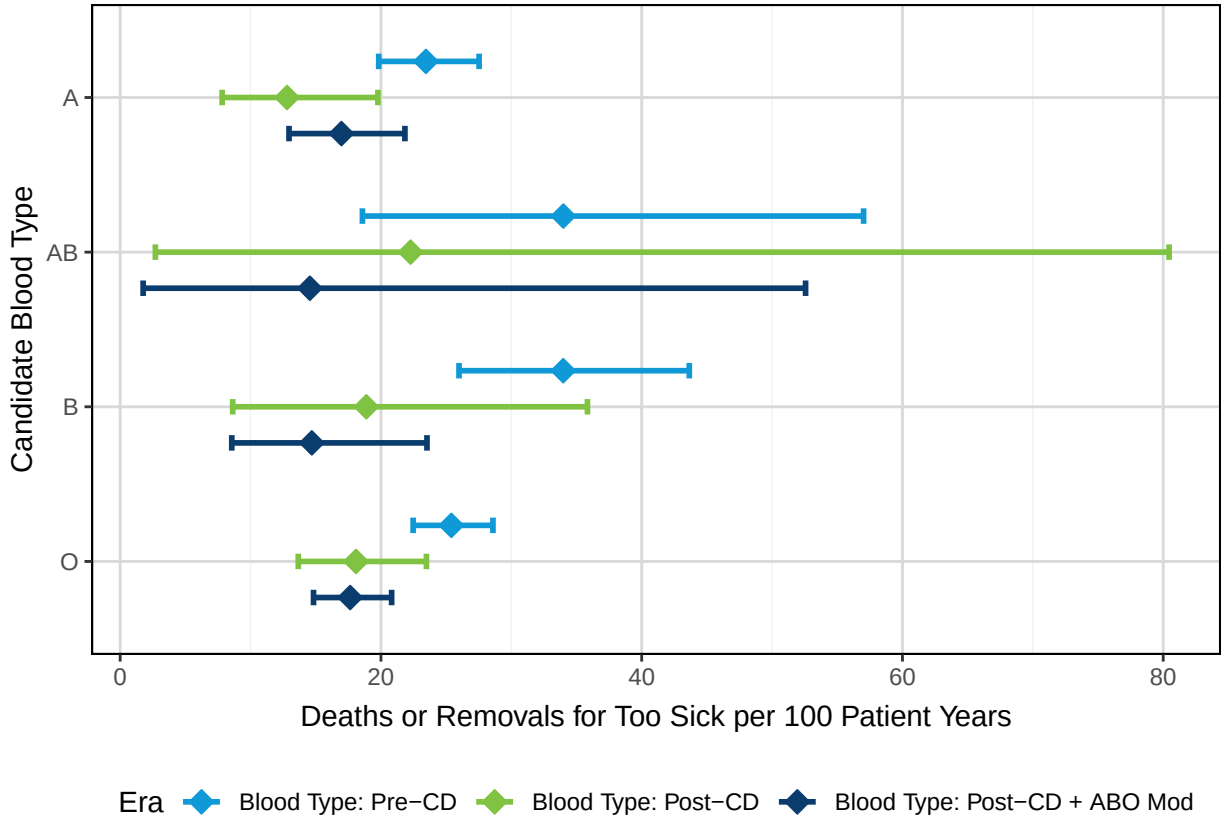


Table 25: Deaths or Removals for Too Sick per 100 Patient Years on the Waiting List by Era and Candidate Blood Type

Candidate Blood Type	Era	N Patients	Deaths or Removals for Too Sick per 100 Patient Years	95% Confidence Interval
A	Blood Type: Pre-CD	2475	23.45	(19.83, 27.53)
	Blood Type: Post-CD	1001	12.80	(7.82, 19.77)
	Blood Type: Post-CD + ABO Mod	2086	16.97	(12.95, 21.84)
AB	Blood Type: Pre-CD	233	33.99	(18.58, 57.02)
	Blood Type: Post-CD	86	22.27	(2.70, 80.45)
	Blood Type: Post-CD + ABO Mod	191	14.55	(1.76, 52.57)
B	Blood Type: Pre-CD	803	33.98	(25.99, 43.65)
	Blood Type: Post-CD	313	18.88	(8.63, 35.84)
	Blood Type: Post-CD + ABO Mod	631	14.70	(8.56, 23.53)
O	Blood Type: Pre-CD	3318	25.40	(22.47, 28.59)
	Blood Type: Post-CD	1337	18.09	(13.66, 23.49)
	Blood Type: Post-CD + ABO Mod	2967	17.64	(14.83, 20.82)

Compared to the Pre-CD era, the transplant rate in the Post-CD era increased for candidates with blood types A, AB, and B and remained higher in the Post-CD + ABO Modification era. However, the transplant rate for candidates with blood type O decreased slightly from the Pre-CD era to the Post-CD era and increased from the Post-CD era to the Post-CD + ABO Modification era.

Figure 26: Lung Transplants per 100 Patient Years on the Waiting List by Era and Candidate Blood Type

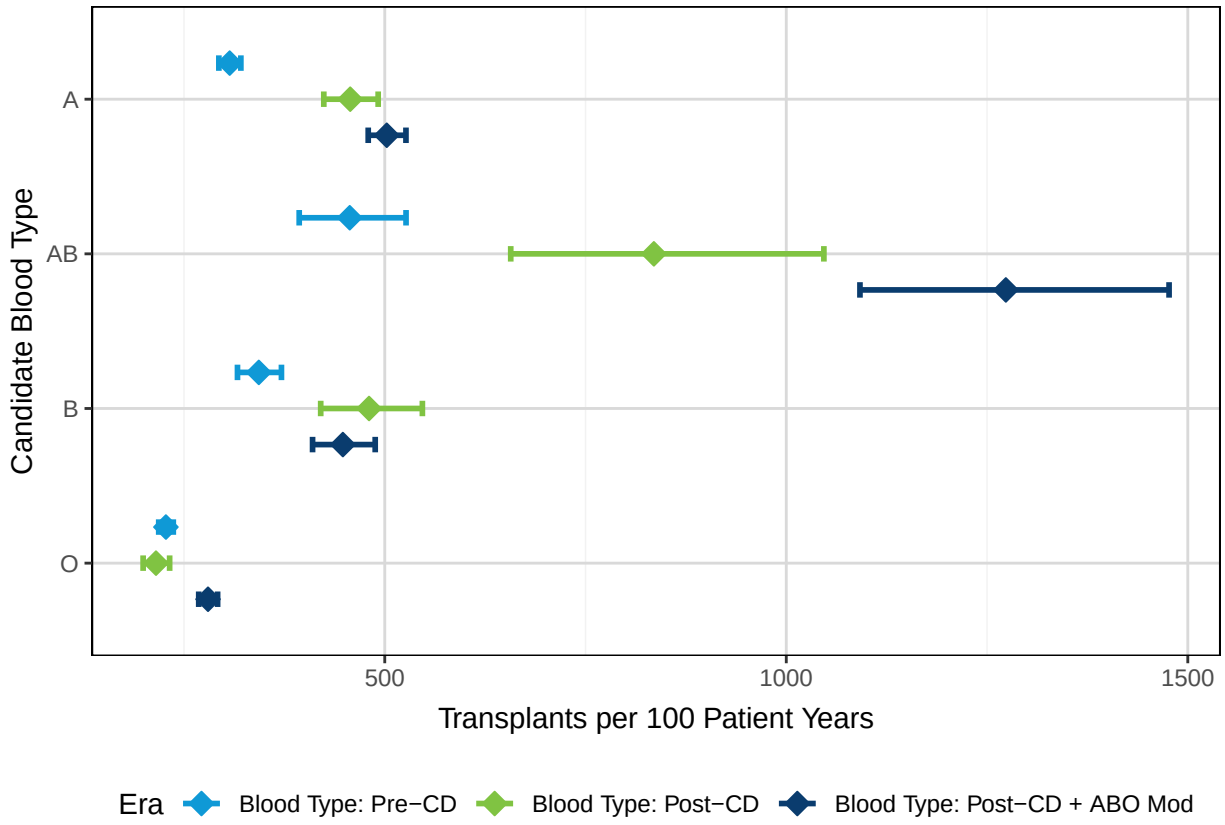


Table 26: Lung Transplants per 100 Patient Years on the Waiting List by Era and Candidate Blood Type

Candidate Blood Type	Era	N Patients	Transplants per 100 Patient Years	95% Confidence Interval
A	Blood Type: Pre-CD	2475	306.87	(293.40, 320.80)
	Blood Type: Post-CD	1001	456.99	(424.08, 491.78)
	Blood Type: Post-CD + ABO Mod	2086	502.47	(479.38, 526.39)
AB	Blood Type: Pre-CD	233	456.37	(393.46, 526.48)
	Blood Type: Post-CD	86	835.11	(656.87, 1046.82)
	Blood Type: Post-CD + ABO Mod	191	1273.43	(1091.74, 1476.70)
B	Blood Type: Pre-CD	803	343.14	(316.57, 371.34)
	Blood Type: Post-CD	313	480.43	(420.21, 546.85)
	Blood Type: Post-CD + ABO Mod	631	447.83	(410.09, 488.11)
O	Blood Type: Pre-CD	3318	227.45	(218.52, 236.65)
	Blood Type: Post-CD	1337	215.11	(199.08, 232.09)
	Blood Type: Post-CD + ABO Mod	2967	279.90	(268.34, 291.83)

In the Post-CD era a larger proportion of blood type O donor lungs were transplanted to blood type A and B recipients compared to the Pre-CD era. However, in the Post-CD + ABO Modification era, the proportion of blood type O donor lungs going to blood type O recipients increased close to pre-CD levels. Note that in the Pre-CD era there was one transplant reported from a blood type A donor to a blood type O recipient; this was a pediatric intended blood group incompatible transplant.

Figure 27: Percent of Lung Transplants by Era, Donor Blood Type, and Recipient Blood Type

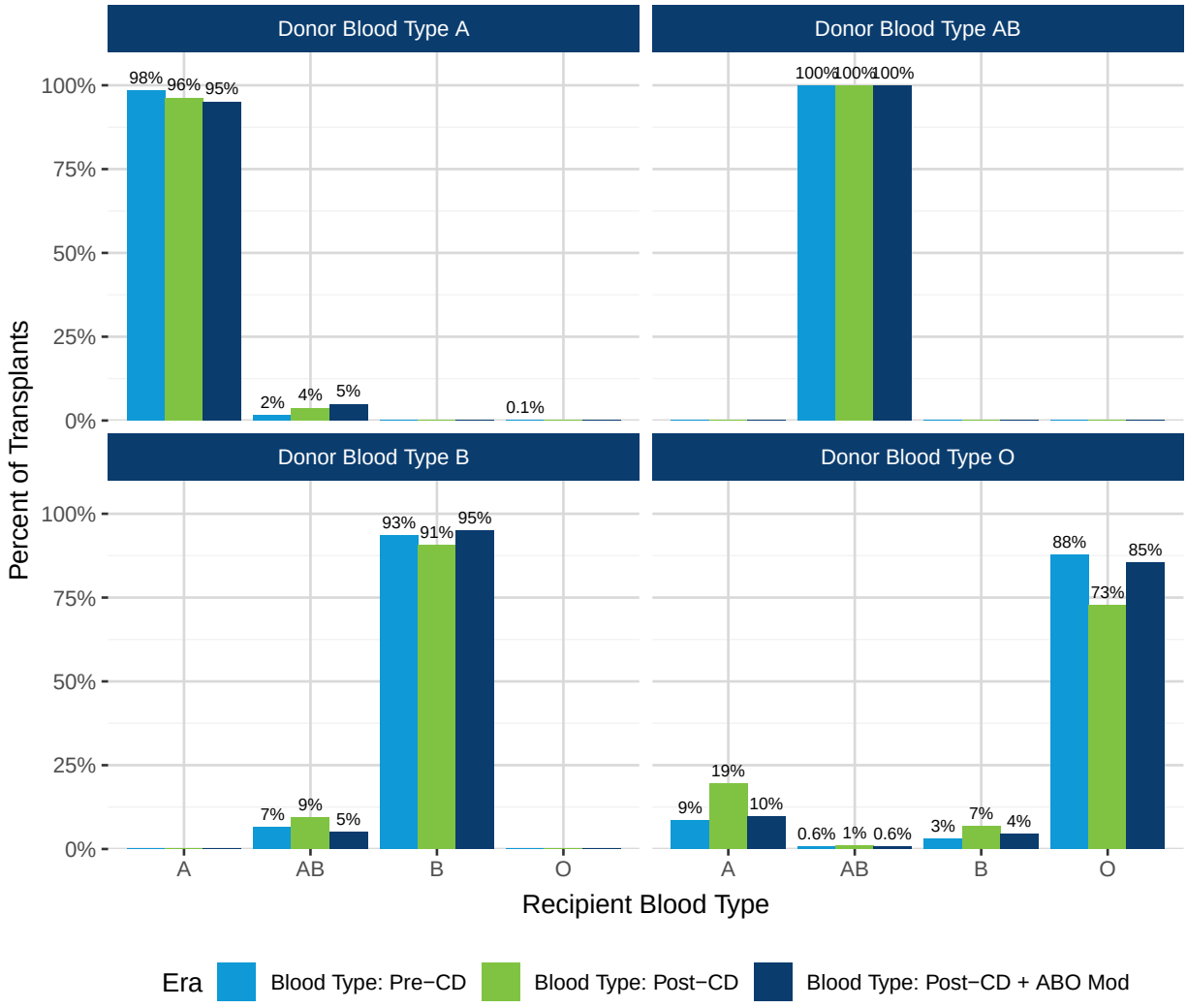


Table 27: Percent of Lung Transplants by Era, Donor Blood Type, and Recipient Blood Type

Donor Blood Type	Recipient Blood Type	Era		
		Blood Type: Pre-CD	Blood Type: Post-CD	Blood Type: Post-CD + ABO Mod
A	A	1729 (98.4%)	541 (96.3%)	1534 (95.1%)
	AB	27 (1.5%)	21 (3.7%)	79 (4.9%)
	B	0 (0.0%)	0 (0.0%)	0 (0.0%)
	O	1 (0.1%)	0 (0.0%)	0 (0.0%)
	Total	1757 (100.0%)	562 (100.0%)	1613 (100.0%)
AB	A	0 (0.0%)	0 (0.0%)	0 (0.0%)
	AB	106 (100.0%)	28 (100.0%)	59 (100.0%)
	B	0 (0.0%)	0 (0.0%)	0 (0.0%)
	O	0 (0.0%)	0 (0.0%)	0 (0.0%)
	Total	106 (100.0%)	28 (100.0%)	59 (100.0%)
B	A	0 (0.0%)	0 (0.0%)	0 (0.0%)
	AB	37 (6.5%)	17 (9.3%)	22 (5.1%)
	B	531 (93.5%)	166 (90.7%)	406 (94.9%)
	O	0 (0.0%)	0 (0.0%)	0 (0.0%)
	Total	568 (100.0%)	183 (100.0%)	428 (100.0%)
O	A	240 (8.6%)	179 (19.4%)	249 (9.6%)
	AB	18 (0.6%)	9 (1.0%)	15 (0.6%)
	B	86 (3.1%)	64 (6.9%)	113 (4.4%)
	O	2460 (87.7%)	671 (72.7%)	2218 (85.5%)
	Total	2804 (100.0%)	923 (100.0%)	2595 (100.0%)

Compared to the Pre-CD era, the median time to transplant decreased for candidates with blood types A, AB, and B in the Post-CD era; however, median waiting time increased slightly for candidates with blood type B in the Post-CD + ABO Modification era. For candidates with blood type O, median time to transplant increased from the Pre-CD era to the Post-CD era and then decreased in the Post-CD + ABO Modification era. Despite the decrease in median waiting time in the ABO Modification era, candidates with blood type O continue to have a longer median waiting time than candidates with other blood types.

Figure 28: Median Time to Transplant (Days) by Era and Recipient Blood Type

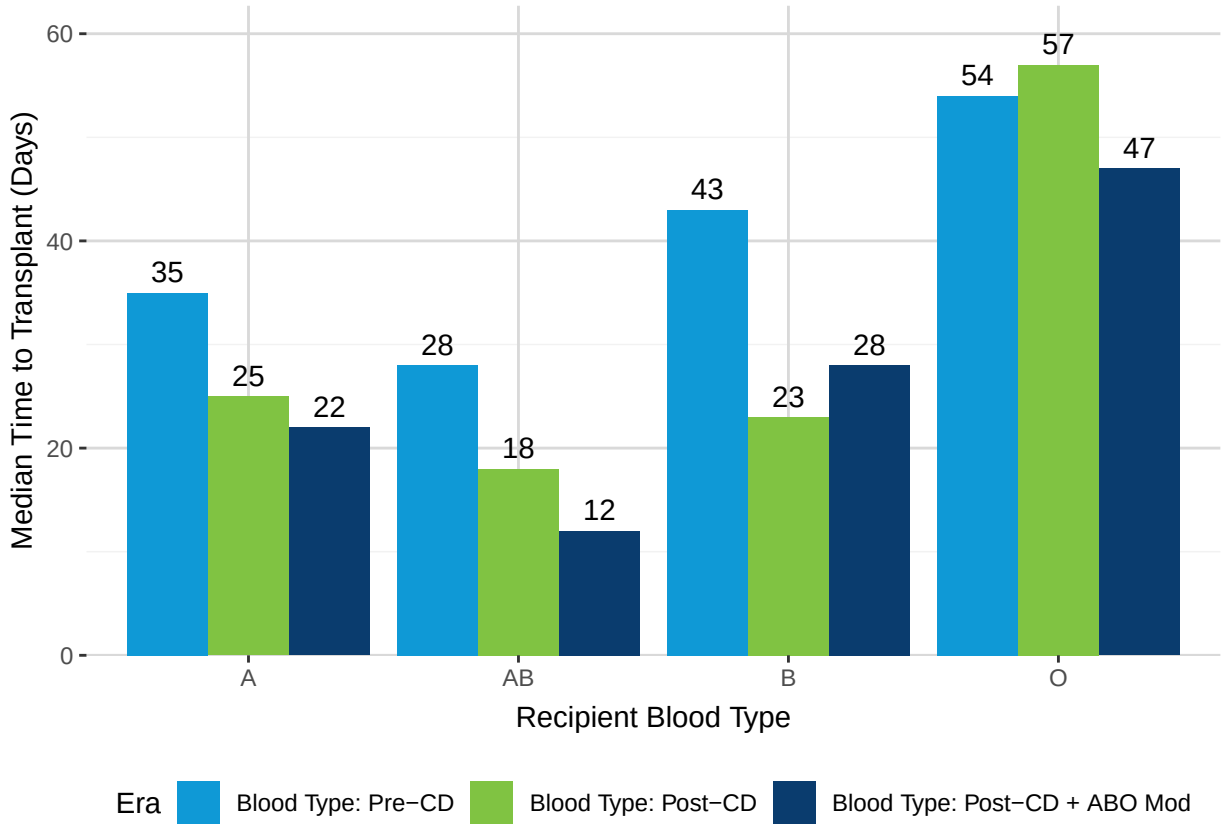


Table 28: Median Time to Transplant (Days) by Era and Recipient Blood Type

Recipient Blood Type	Era	N Registrations	Median Time to Transplant (Days)
A	Blood Type: Pre-CD	2234	35
	Blood Type: Post-CD	701	25
	Blood Type: Post-CD + ABO Mod	1870	22
AB	Blood Type: Pre-CD	209	28
	Blood Type: Post-CD	63	18
	Blood Type: Post-CD + ABO Mod	183	12
B	Blood Type: Pre-CD	724	43
	Blood Type: Post-CD	213	23
	Blood Type: Post-CD + ABO Mod	566	28
O	Blood Type: Pre-CD	2837	54
	Blood Type: Post-CD	862	57
	Blood Type: Post-CD + ABO Mod	2435	47

Median distance from the donor hospital to transplant program increased across all blood types from the Pre-CD era to the Post-CD era, and again from the Post-CD era to the Post-CD + ABO Modification era.

Figure 29: Distribution of Distance (in Nautical Miles) from Donor Hospital to Transplant Program by Era and Recipient Blood Type

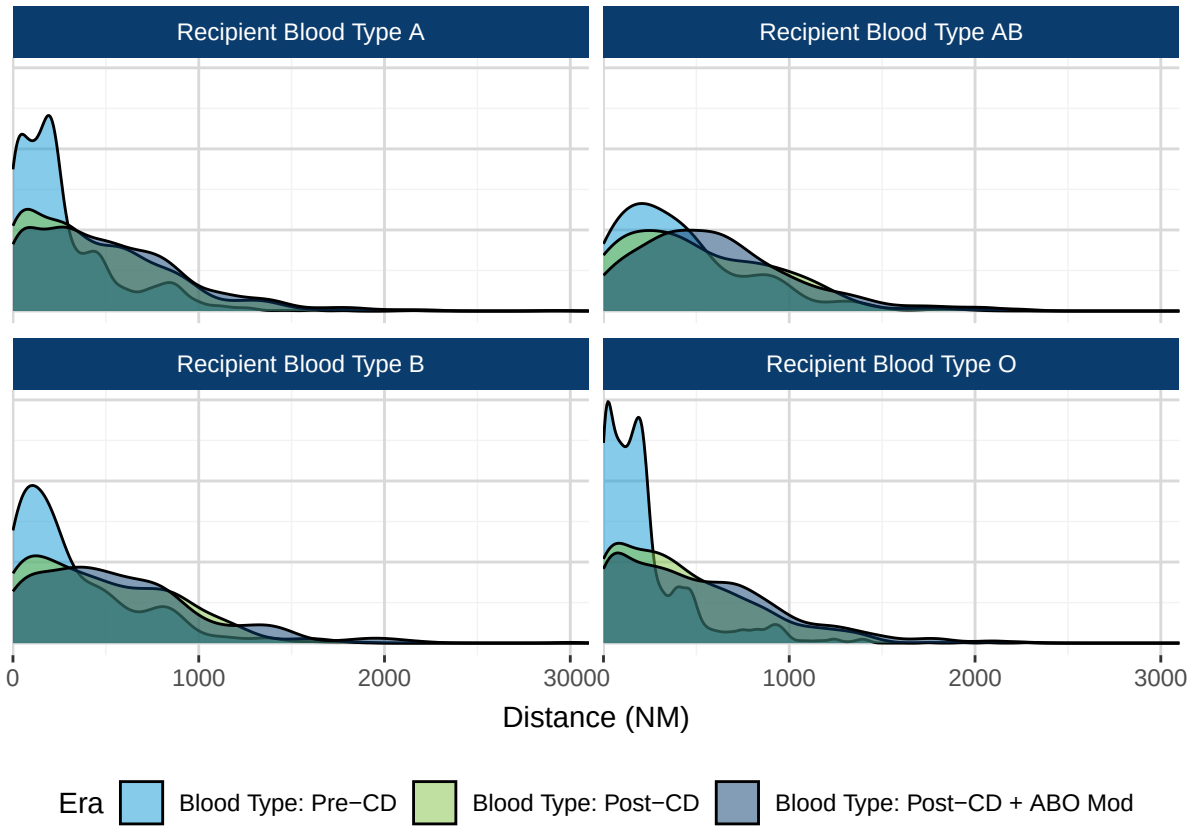


Table 29: Distribution of Distance (in Nautical Miles) from Donor Hospital to Transplant Program by Era and Recipient Blood Type

Recipient Blood Type	Era	N	N Missing	Min	25th Percentile	Median	Mean	75th Percentile	Max
A	Blood Type: Pre-CD	1969	0	0	84.00	199.0	276.44	383.00	2161
	Blood Type: Post-CD	720	0	0	124.50	345.5	430.00	651.25	2920
	Blood Type: Post-CD + ABO Mod	1783	0	0	195.50	440.0	509.30	750.50	2920
AB	Blood Type: Pre-CD	188	0	0	157.50	343.0	433.80	615.75	2225
	Blood Type: Post-CD	75	0	0	182.00	410.0	505.37	792.50	1769
	Blood Type: Post-CD + ABO Mod	175	0	4	307.50	557.0	602.48	821.00	2058
B	Blood Type: Pre-CD	617	0	0	84.00	214.0	332.51	487.00	2998
	Blood Type: Post-CD	230	0	0	154.75	409.5	475.17	761.00	1652
	Blood Type: Post-CD + ABO Mod	519	0	0	230.00	493.0	565.87	800.00	2185
O	Blood Type: Pre-CD	2461	0	0	67.00	165.0	230.54	279.00	2275
	Blood Type: Post-CD	671	0	0	130.00	348.0	428.29	644.00	2244
	Blood Type: Post-CD + ABO Mod	2218	0	0	166.00	428.0	514.68	760.00	2349
Total	Blood Type: Pre-CD	5235	0	0	77.00	189.0	267.12	362.50	2998
	Blood Type: Post-CD	1696	0	0	130.00	359.0	438.78	676.25	2920
	Blood Type: Post-CD + ABO Mod	4695	0	0	189.00	444.0	521.57	760.00	2920

The following figure and table show the distribution of waiting list area under the curve (WLAUC) for transplant recipients by era and recipient blood type. WLAUC is derived from the area under the estimated 1-year survival curve for each patient and represents the estimated number of days a patient is expected to live up to the next year on the waiting list without a transplant. Smaller WLAUC values mean that candidates are more medically urgent and larger WLAUC values mean that candidates are less medically urgent. In the Post-CD and Post-CD + ABO Modification eras, WLAUC is used to calculate the number of CAS medical urgency points that candidates receive.

Overall, compared to the Pre-CD era, the median WLAUC at transplant increased by a few days after lung CD was implemented, and remained similar after the blood type modification policy was implemented. However, under all policy eras, blood type O candidates continue to be more medically urgent at the time of transplant compared to candidates of other blood types.

Figure 30: Distribution of WLAUC at Transplant by Era and Recipient Blood Type

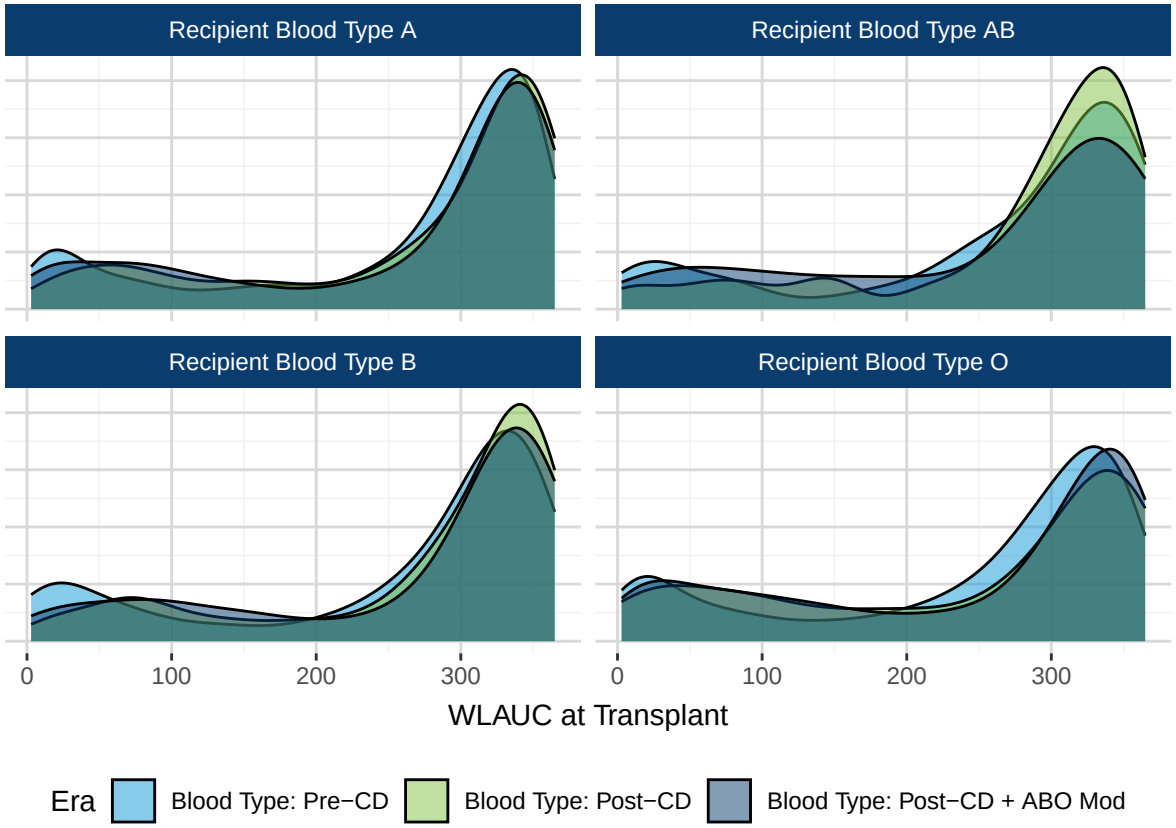


Table 30: Distribution of WLAUC at Transplant by Era and Recipient Blood Type

Recipient Blood Type	Era	N	N Missing	Min	25th Percentile	Median	Mean	75th Percentile	Max
A	Blood Type: Pre-CD	1969	0	3.03	219.54	307.16	258.48	337.60	364.68
	Blood Type: Post-CD	720	0	9.33	220.89	318.38	267.17	347.95	363.82
	Blood Type: Post-CD + ABO Mod	1783	0	4.04	168.61	316.74	257.30	344.72	364.75
AB	Blood Type: Pre-CD	188	0	4.80	236.34	311.45	262.65	343.97	364.79
	Blood Type: Post-CD	75	0	5.21	265.65	311.82	276.41	341.25	361.13
	Blood Type: Post-CD + ABO Mod	175	0	9.02	177.28	312.76	256.55	343.05	363.27
B	Blood Type: Pre-CD	617	0	3.25	205.66	307.45	253.23	338.01	364.28
	Blood Type: Post-CD	230	0	9.81	244.48	320.64	272.86	346.62	364.77
	Blood Type: Post-CD + ABO Mod	519	0	4.00	190.24	321.37	264.67	345.96	364.73
O	Blood Type: Pre-CD	2461	0	3.05	182.58	293.50	244.03	331.19	364.92
	Blood Type: Post-CD	671	0	6.26	125.46	300.93	240.98	344.53	364.54
	Blood Type: Post-CD + ABO Mod	2218	0	2.86	124.10	301.71	239.72	343.20	364.84
Total	Blood Type: Pre-CD	5235	0	3.03	198.31	301.34	251.22	335.39	364.92
	Blood Type: Post-CD	1696	0	5.21	179.76	313.59	257.99	346.19	364.77
	Blood Type: Post-CD + ABO Mod	4695	0	2.86	144.71	310.77	249.78	344.30	364.84

CAS scores are not available for candidates that were transplanted in the Pre-CD era. The following results describe candidates' CAS scores at transplant, minus the points the candidates received based on their blood type. In both the Post-CD and Post-CD + ABO Modification eras blood type O recipients had the highest median CAS at transplant (excluding the blood type points from their score).

Figure 31: Distribution of CAS at Transplant Excluding Blood Type Points by Era and Recipient Blood Type

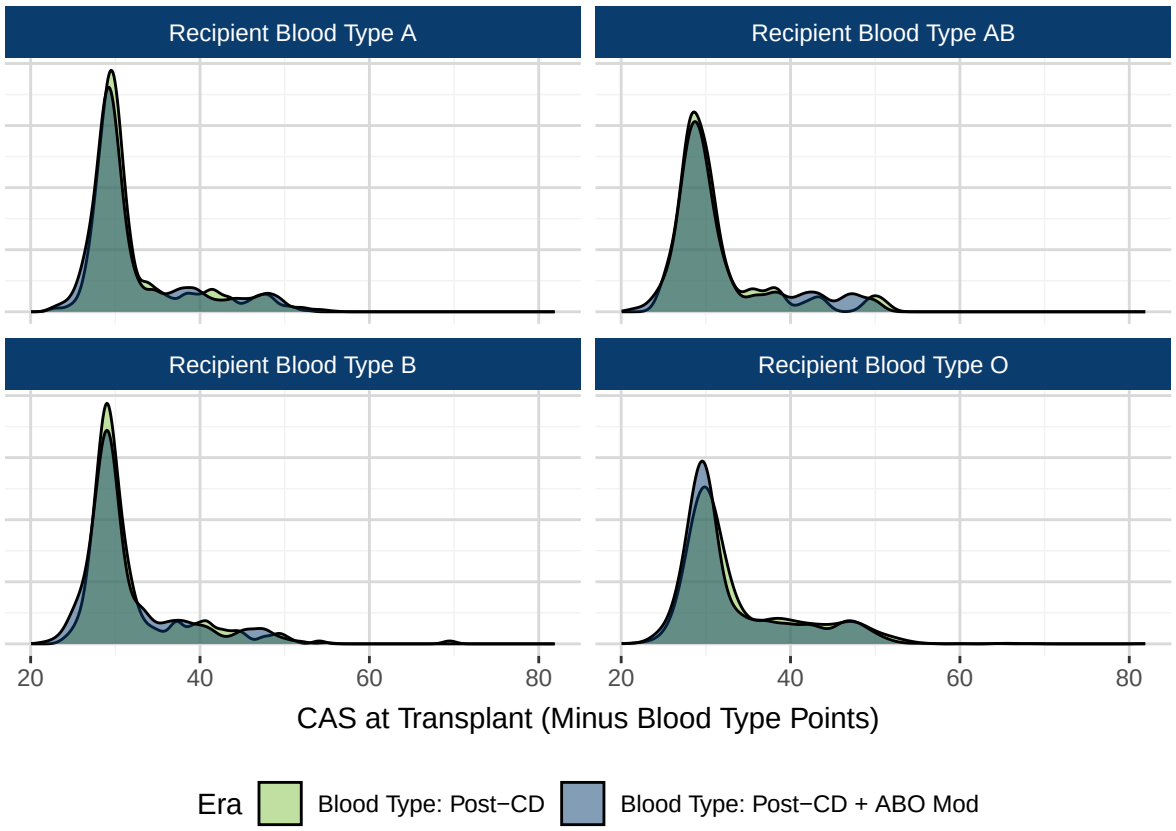
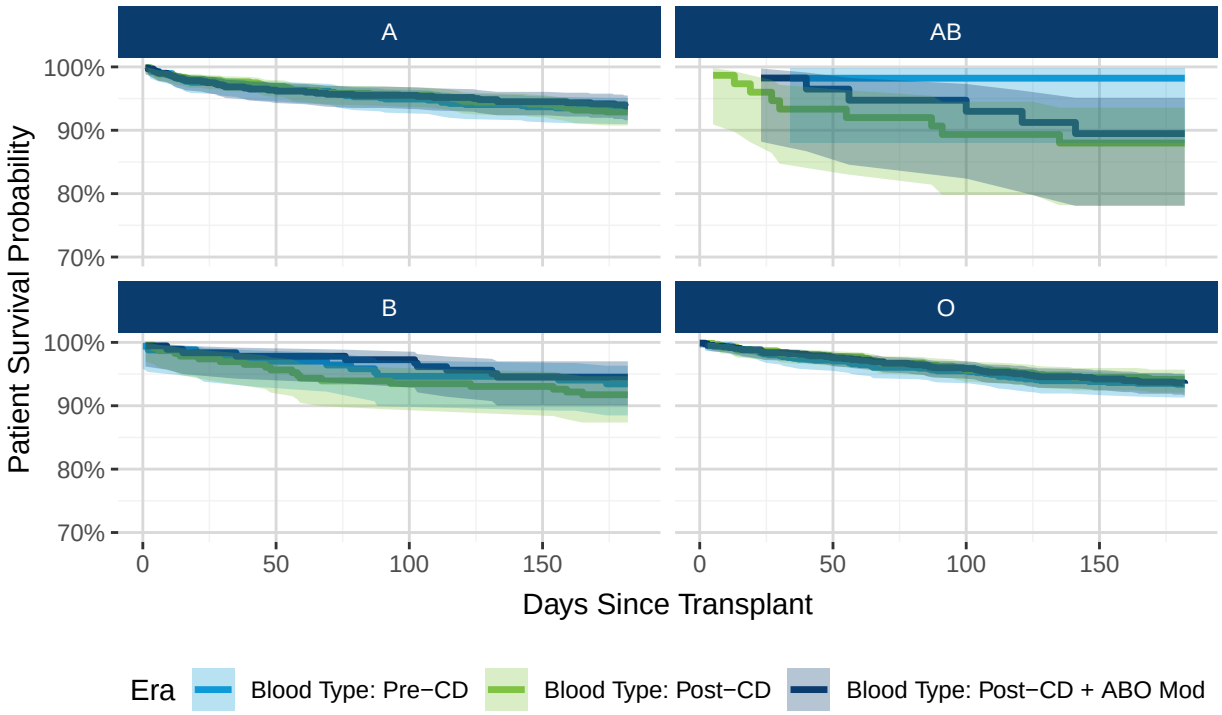


Table 31: Distribution of CAS at Transplant Excluding Blood Type Points by Era and Recipient Blood Type

Recipient Blood Type	Era	N	N Missing	Min	25th Percentile	Median	Mean	75th Percentile	Max
A	Blood Type: Post-CD	720	6	22.54	28.83	29.98	32.06	32.44	52.72
	Blood Type: Post-CD + ABO Mod	1783	5	22.36	28.50	29.73	32.18	33.28	56.05
AB	Blood Type: Post-CD	75	2	25.11	28.03	29.48	31.16	31.44	51.05
	Blood Type: Post-CD + ABO Mod	175	0	21.72	27.94	29.45	31.67	32.24	50.17
B	Blood Type: Post-CD	230	1	24.06	28.51	29.56	31.74	31.81	69.48
	Blood Type: Post-CD + ABO Mod	519	1	21.53	28.19	29.43	31.52	32.76	54.91
O	Blood Type: Post-CD	671	18	22.69	29.32	30.82	33.78	37.32	65.58
	Blood Type: Post-CD + ABO Mod	2218	4	20.06	28.85	30.32	32.98	35.36	81.88
Total	Blood Type: Post-CD	1696	27	22.54	28.87	30.16	32.65	33.81	69.48
	Blood Type: Post-CD + ABO Mod	4695	10	20.06	28.60	29.96	32.46	34.28	81.88

The blood type post-transplant survival analyses are limited to six months of follow-up time because the data are split into three cohorts. Overall, no statistically significant differences in six-month post-transplant survival were observed across candidate blood type or policy eras.

Figure 32: Six-Month Post-Transplant Patient Survival by Era and Recipient Blood Type



In this analysis, the Pre era includes transplant recipients from August 19, 2022 to March 08, 2023, the Post era includes transplant recipients from March 09, 2023 to September 26, 2023, and the Post + ABO era includes transplant recipients from September 27, 2023 to April 15, 2024.

Table 32: Six-Month Post-Transplant Patient Survival by Era and Recipient Blood Type

Blood Type	Era	N Patients	N Deaths	1-Year Survival	95% Confidence Interval
A	Blood Type: Pre-CD	573	38	93.4%	(91.0%, 95.1%)
	Blood Type: Post-CD	720	51	92.9%	(90.8%, 94.6%)
	Blood Type: Post-CD + ABO Mod	601	37	93.8%	(91.6%, 95.5%)
AB	Blood Type: Pre-CD	56	1	98.2%	(88.0%, 99.7%)
	Blood Type: Post-CD	75	9	88.0%	(78.2%, 93.6%)
	Blood Type: Post-CD + ABO Mod	57	6	89.5%	(78.1%, 95.1%)
B	Blood Type: Pre-CD	168	11	93.4%	(88.5%, 96.3%)
	Blood Type: Post-CD	230	19	91.7%	(87.4%, 94.6%)
	Blood Type: Post-CD + ABO Mod	183	10	94.5%	(90.0%, 97.0%)
O	Blood Type: Pre-CD	711	47	93.4%	(91.3%, 95.0%)
	Blood Type: Post-CD	671	39	94.2%	(92.1%, 95.7%)
	Blood Type: Post-CD + ABO Mod	850	55	93.5%	(91.6%, 95.0%)

[a] In this analysis, the Pre era includes transplant recipients from August 19, 2022 to March 08, 2023, the Post era includes transplant recipients from March 09, 2023 to September 26, 2023, and the Post + ABO era includes transplant recipients from September 27, 2023 to April 15, 2024.

CPRA

CPRA was not a component of lung allocation prior to the implementation of continuous distribution and was not calculated for lung candidates before January 26th, 2023 (*see news item*). Because CPRA data are unavailable for a majority of the pre-policy era, this section only includes data for the post-policy era (from March 09, 2023 to March 08, 2025). In the post-policy era, CPRA remains under reported and is missing not at random and should be interpreted accordingly. All data reported in this section reflect the most recent CPRA that is available for a patient in the OPTN Waiting List.

In the post-policy era, the number of deaths or removals for too sick per 100 patient years was similar across all CPRA groupings. The confidence intervals are large for the CPRA 98+ group due to the small sample size.

Figure 33: Deaths or Removals for Too Sick per 100 Patient Years on the Waiting List by CPRA in the Post-Policy Era

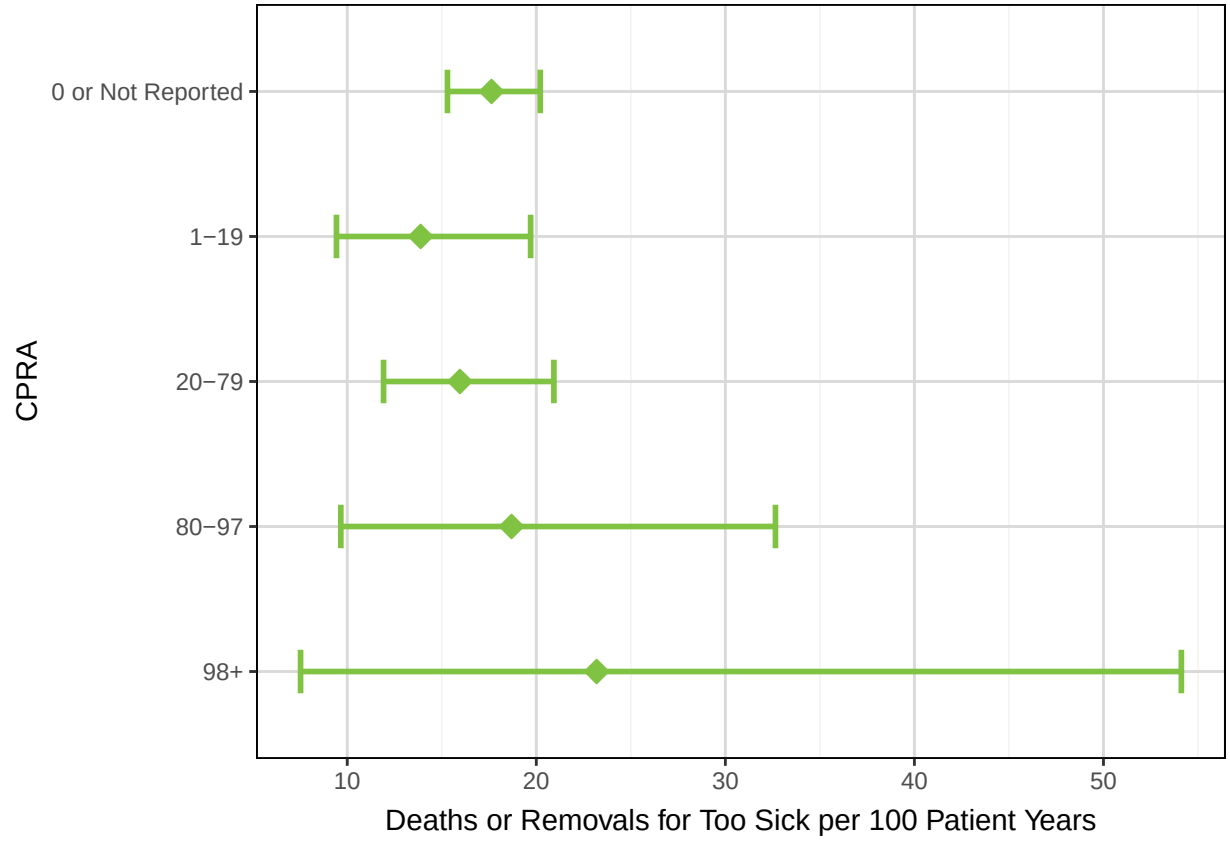


Table 33: Deaths or Removals for Too Sick per 100 Patient Years on the Waiting List by CPRA in the Post-Policy Era

CPRA	N Patients	Deaths or Removals for Too Sick per 100 Patient Years	95% Confidence Interval
0 or Not Reported	5613	17.63	(15.30, 20.21)
1-19	828	13.88	(9.43, 19.70)
20-79	1075	15.96	(11.92, 20.93)
80-97	171	18.69	(9.66, 32.65)
98+	34	23.19	(7.53, 54.12)

In the post-policy era, the number of transplants per 100 patient years was highest for individuals with no unacceptable antigens entered in the OPTN Waiting List.

Figure 34: Lung Transplants per 100 Patient Years on the Waiting List by CPRA in the Post-Policy Era

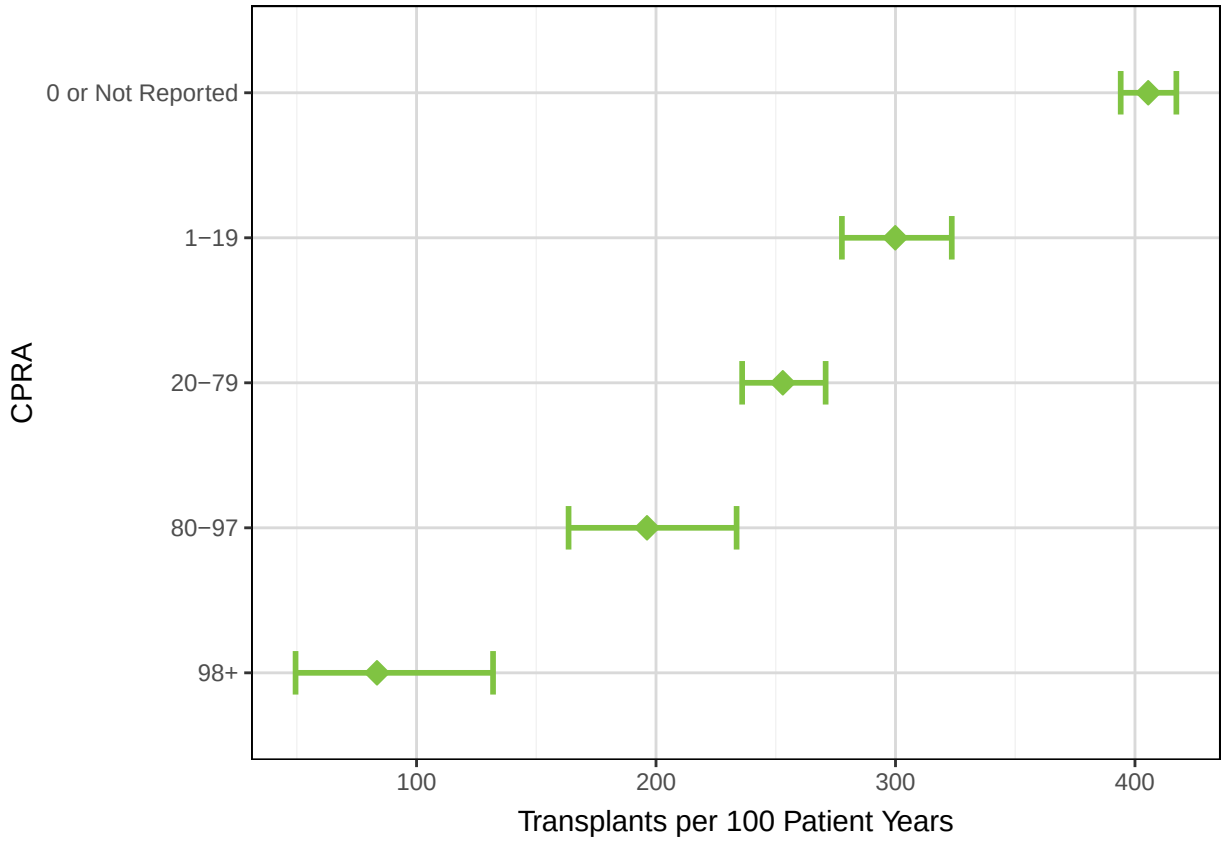


Table 34: Lung Transplants per 100 Patient Years on the Waiting List by CPRA in the Post-Policy Era

CPRA	N Patients	Transplants per 100 Patient Years	95% Confidence Interval
0 or Not Reported	5613	405.54	(394.04, 417.28)
1-19	828	299.90	(277.62, 323.50)
20-79	1075	252.95	(235.97, 270.83)
80-97	171	196.24	(163.48, 233.65)
98+	34	83.49	(49.48, 131.95)

In the post-policy era, median time to transplant was longest for the most sensitized candidates. For this analysis, candidates in the 80-97 and 98+ groups were combined because of the small sample size.

Figure 35: Median Time to Transplant (Days) by CPRA in the Post-Policy Era

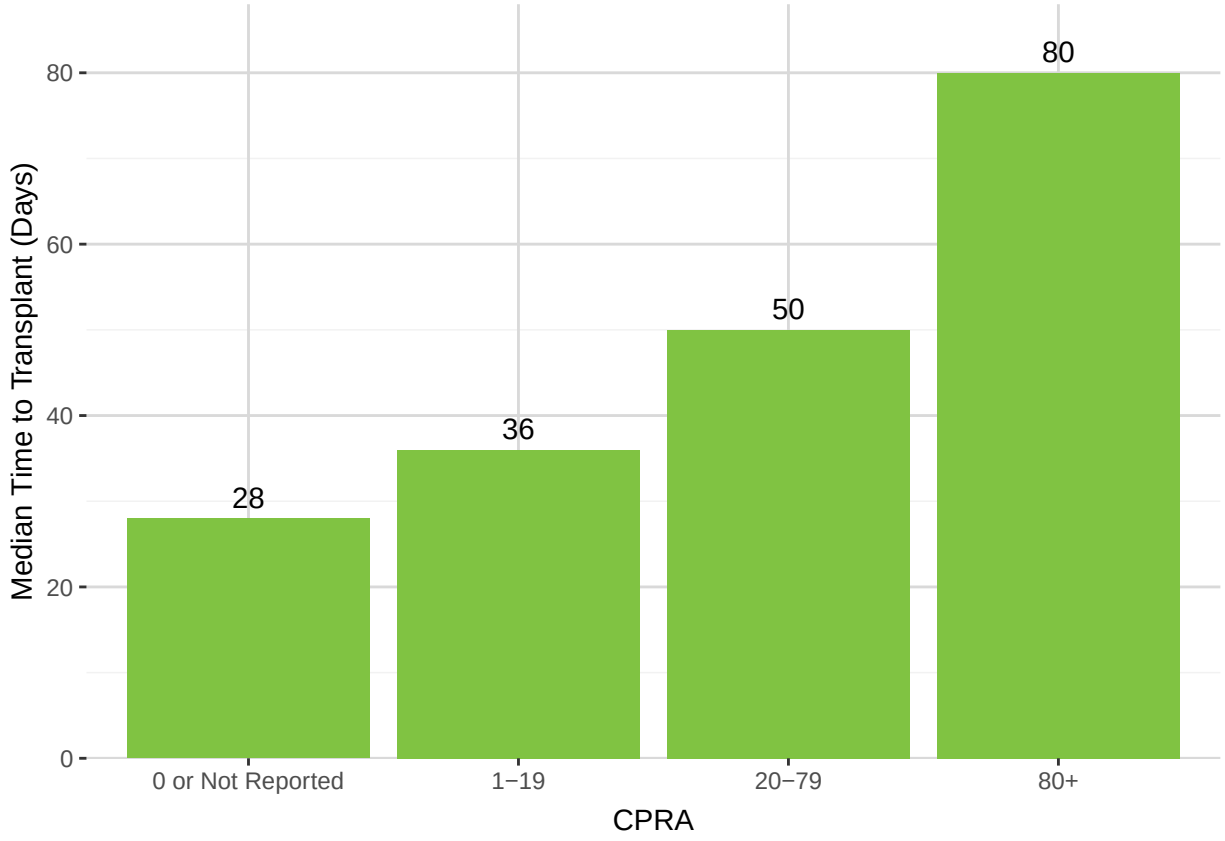
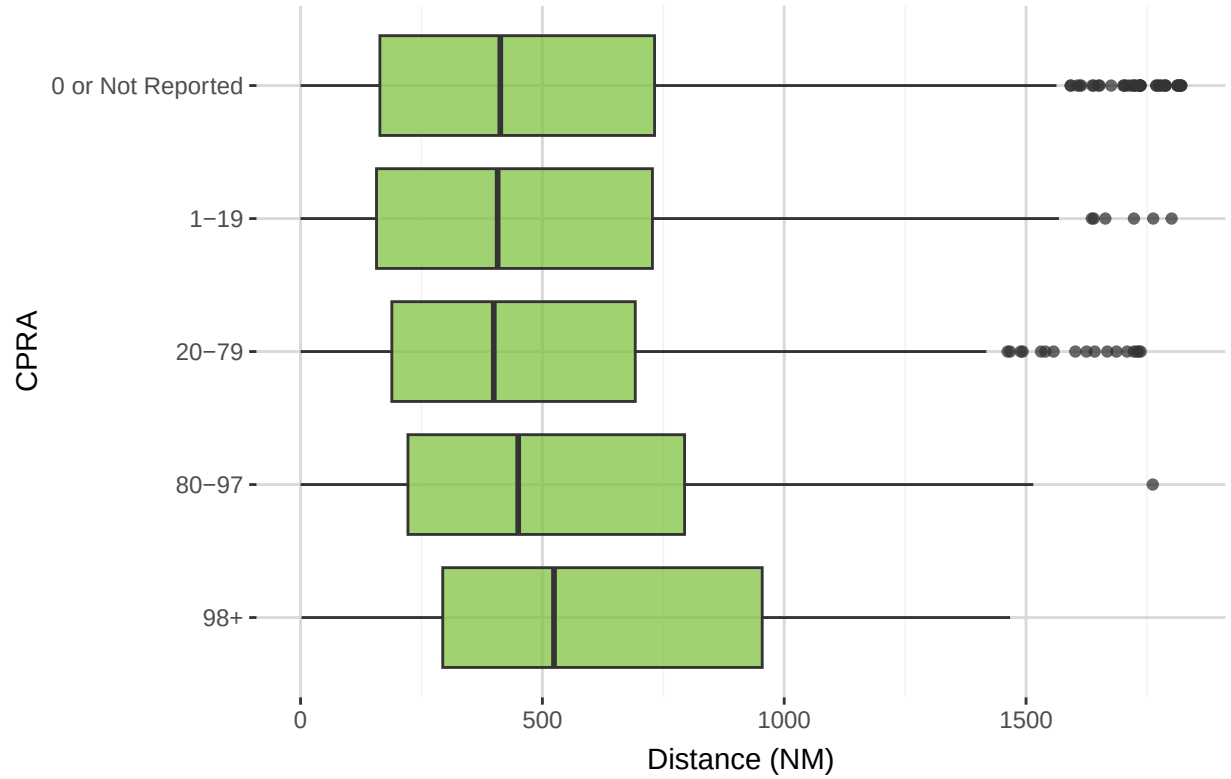


Table 35: Median Time to Transplant (Days) by CPRA in the Post-Policy Era

CPRA	N Registrations	Median Time to Transplant (Days)
0 or Not Reported	5207	28
1-19	675	36
20-79	863	50
80+	148	80

In the post-policy era, median distance was greatest for the most sensitized candidates.

Figure 36: Distribution of Distance (in Nautical Miles) from Donor Hospital to Transplant Program by CPRA in the Post-Policy Era



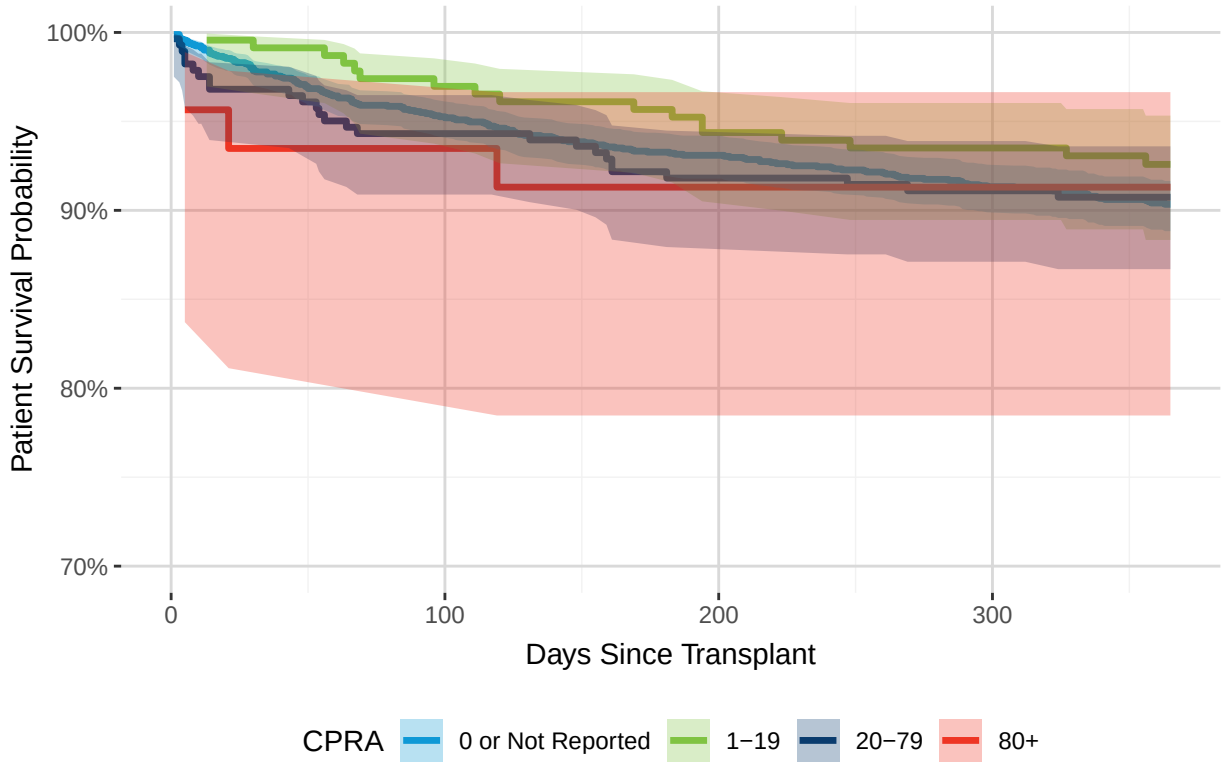
View is restricted to the 99th percentile of distance (1821 NM). There were 66 cases where lungs traveled further than this distance in the post−policy era.

Table 36: Distribution of Distance (in Nautical Miles) from Donor Hospital to Transplant Program by CPRA in the Post-Policy Era

CPRA	N	N Missing	Min	25th Percentile	Median	Mean	75th Percentile	Max
0 or Not Reported	4618	0	0	166.00	418.0	499.44	742.75	2920
1-19	714	0	0	157.00	412.5	489.05	740.25	2349
20-79	840	0	0	190.75	406.5	489.33	705.50	2244
80-97	162	0	0	224.25	451.0	548.50	799.25	2227
98+	57	0	2	299.00	527.0	656.96	1026.00	2058
Total	6391	0	0	171.00	419.0	499.60	741.00	2920

There were no significant differences in one-year patient post-transplant survival by recipients' CPRA reported in the OPTN Waiting List in the post-policy era.

Figure 37: One-Year Post-Transplant Patient Survival by CPRA in the Post-Policy Era



In this analysis, the post–policy era includes transplant recipients from March 09, 2023 to December 08, 2023.

Table 37: One-Year Post-Transplant Patient Survival by by CPRA in the Post-Policy Era

CPRA	N Patients	N Deaths	1-Year Survival	95% Confidence Interval
0 or Not Reported	1714	164	90.3%	(88.8%, 91.7%)
1-19	231	17	92.6%	(88.3%, 95.3%)
20-79	282	26	90.7%	(86.7%, 93.6%)
80+	46	4	91.3%	(78.5%, 96.6%)

[a] In this analysis, the post-policy era includes transplant recipients from March 09, 2023 to December 08, 2023.

Height

In all height analyses, pediatric candidates are grouped separately from adult candidates. Although points for height are assigned in the same manner for pediatric and adult candidates, we report the results this way to closely monitor how shorter adults are impacted by continuous distribution, and to not conflate their data with that of pediatric candidates, who tend to be shorter and also receive pediatric allocation points.

The number of deaths or removals for too sick per 100 patient years decreased in the post-policy era for all pediatric and adult height groups. For the shortest and tallest adult height groupings (<=158cm, >170.1-177.7cm, and >177.7cm) the decrease was statistically significant. For all other groupings, the change was not statistically significant.

Figure 38: Deaths or Removals for Too Sick per 100 Patient Years on the Waiting List by Era and Height

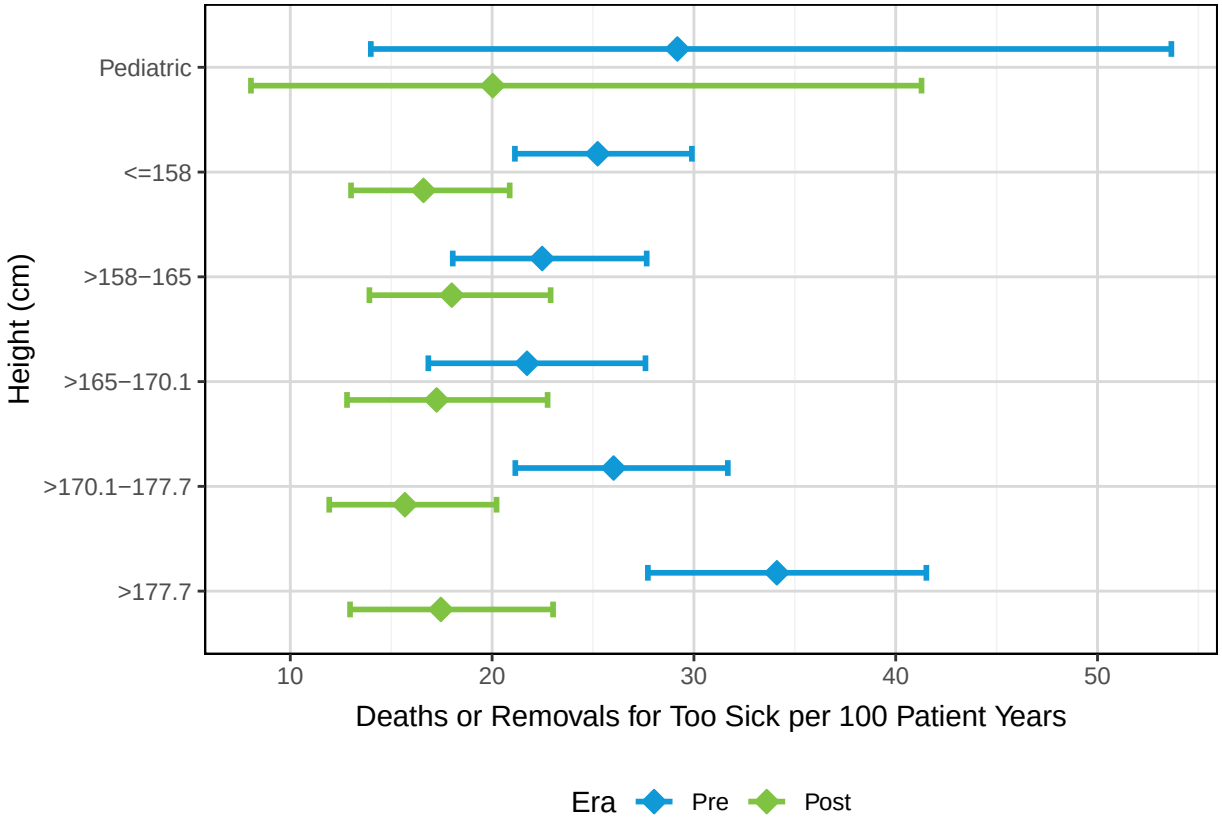


Table 38: Deaths or Removals for Too Sick per 100 Patient Years on the Waiting List by Era and Height

Height (cm)	Era	N Patients	Deaths or Removals for Too Sick per 100 Patient Years	95% Confidence Interval
Pediatric	Pre	88	29.18	(13.99, 53.66)
	Post	87	20.03	(8.05, 41.28)
<=158	Pre	1206	25.23	(21.13, 29.90)
	Post	1338	16.60	(13.01, 20.87)
>158-165	Pre	1115	22.48	(18.05, 27.66)
	Post	1321	18.00	(13.92, 22.90)
>165-170.1	Pre	1086	21.73	(16.84, 27.60)
	Post	1263	17.25	(12.81, 22.75)
>170.1-177.7	Pre	1659	26.02	(21.15, 31.68)
	Post	1848	15.68	(11.93, 20.22)
>177.7	Pre	1700	34.11	(27.72, 41.52)
	Post	1844	17.46	(12.96, 23.02)

The number of lung transplants per 100 patient years increased significantly in the post-policy era for all adult height groupings. The number of transplants per 100 patient years also increased slightly for pediatric recipients, though the change was not statistically significant.

Figure 39: Lung Transplants per 100 Patient Years on the Waiting List by Era and Height

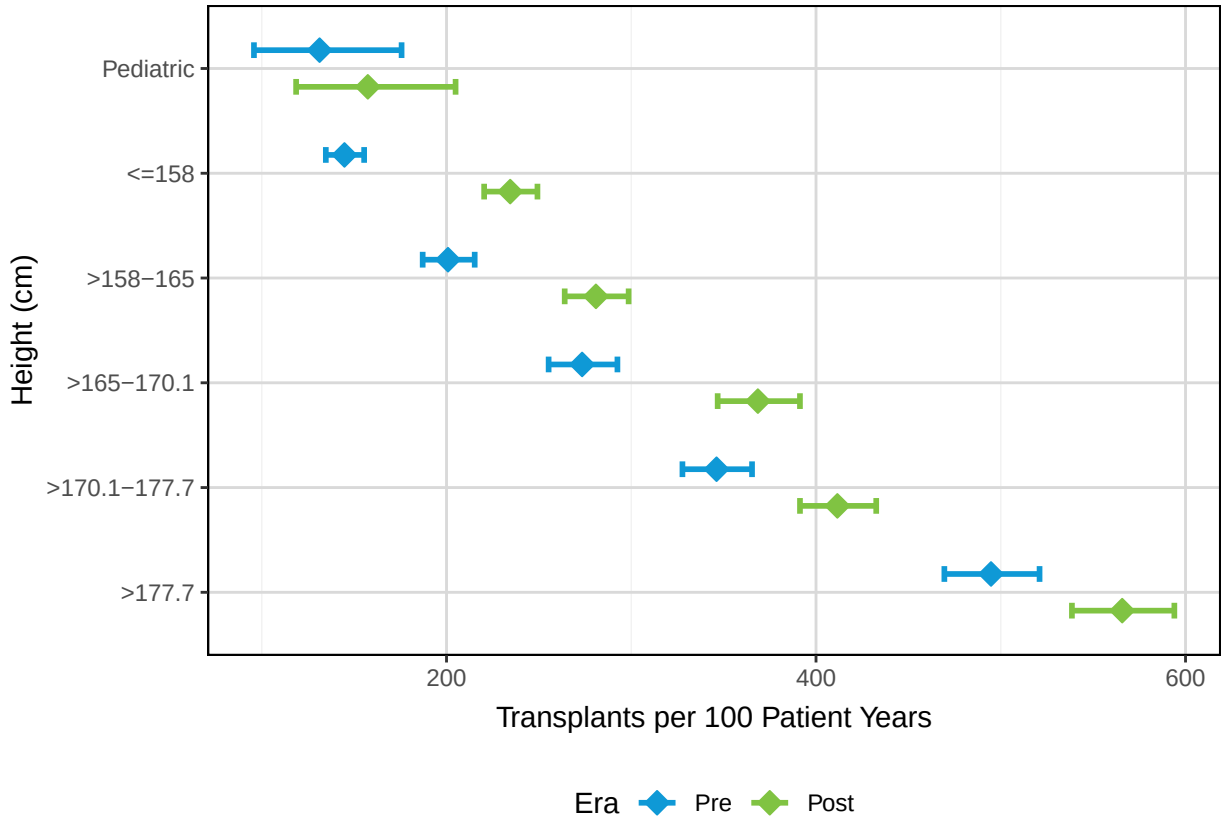


Table 39: Lung Transplants per 100 Patient Years on the Waiting List by Era and Height

Height (cm)	Era	N Patients	Transplants per 100 Patient Years	95% Confidence Interval
Pediatric	Pre	88	131.29	(95.77, 175.68)
	Post	87	157.41	(118.59, 204.90)
<=158	Pre	1206	144.76	(134.67, 155.41)
	Post	1338	234.46	(220.37, 249.22)
>158-165	Pre	1115	200.80	(187.09, 215.26)
	Post	1321	280.87	(263.97, 298.56)
>165-170.1	Pre	1086	273.40	(255.26, 292.50)
	Post	1263	368.53	(346.76, 391.31)
>170.1-177.7	Pre	1659	346.15	(327.70, 365.36)
	Post	1848	411.56	(391.32, 432.58)
>177.7	Pre	1700	494.72	(469.46, 520.99)
	Post	1844	565.73	(538.51, 593.96)

In the post-policy era, median time to transplant decreased for pediatric candidates and adult candidates of all heights.

Figure 40: Median Time to Transplant (Days) by Era and Height

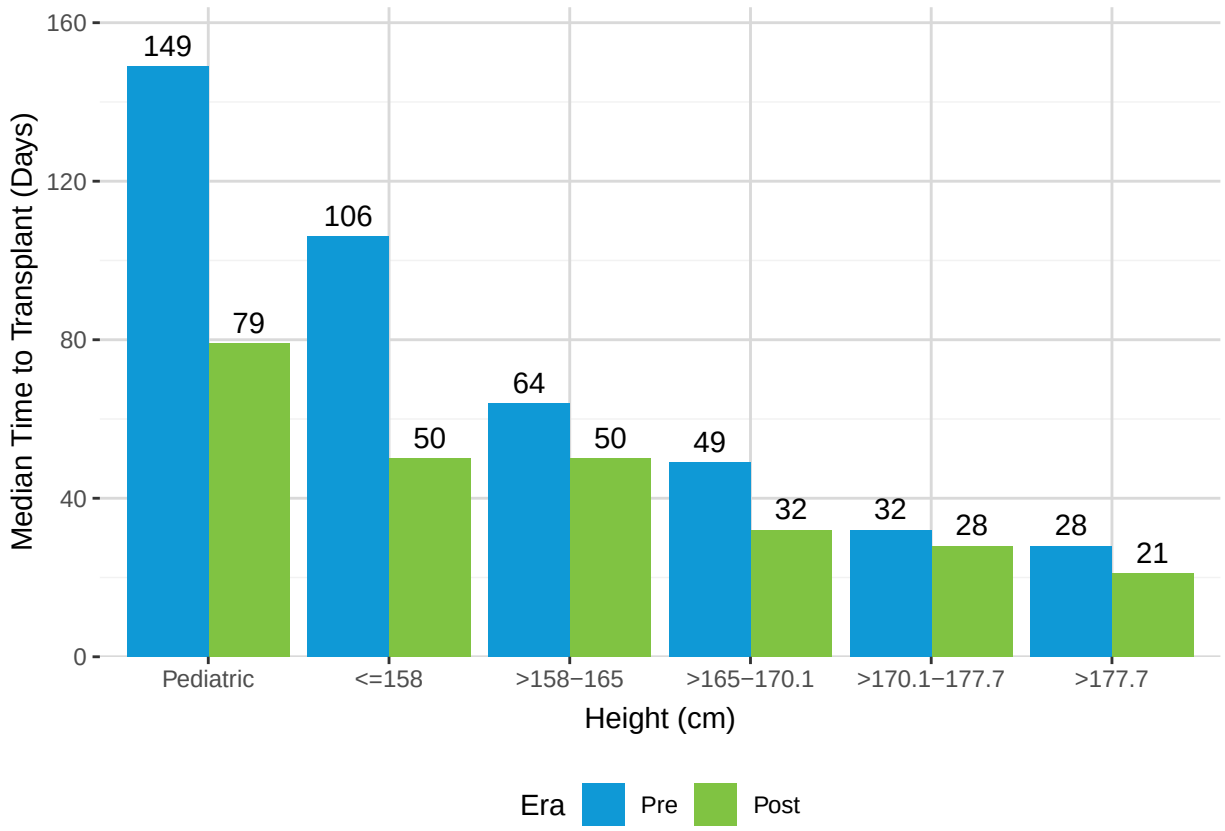


Table 40: Median Time to Transplant (Days) by Era and Height

Height (cm)	Era	N Registrations	Median Time to Transplant (Days)
Pediatric	Pre	72	149
	Post	62	79
<=158	Pre	983	106
	Post	1099	50
>158-165	Pre	950	64
	Post	1156	50
>165-170.1	Pre	935	49
	Post	1147	32
>170.1-177.7	Pre	1494	32
	Post	1689	28
>177.7	Pre	1570	28
	Post	1740	21

In the post era, median distance from the donor hospital to transplant program increased for pediatric recipients and adult recipients of all heights.

Figure 41: Distribution of Distance (in Nautical Miles) from Donor Hospital to Transplant Program by Era and Height

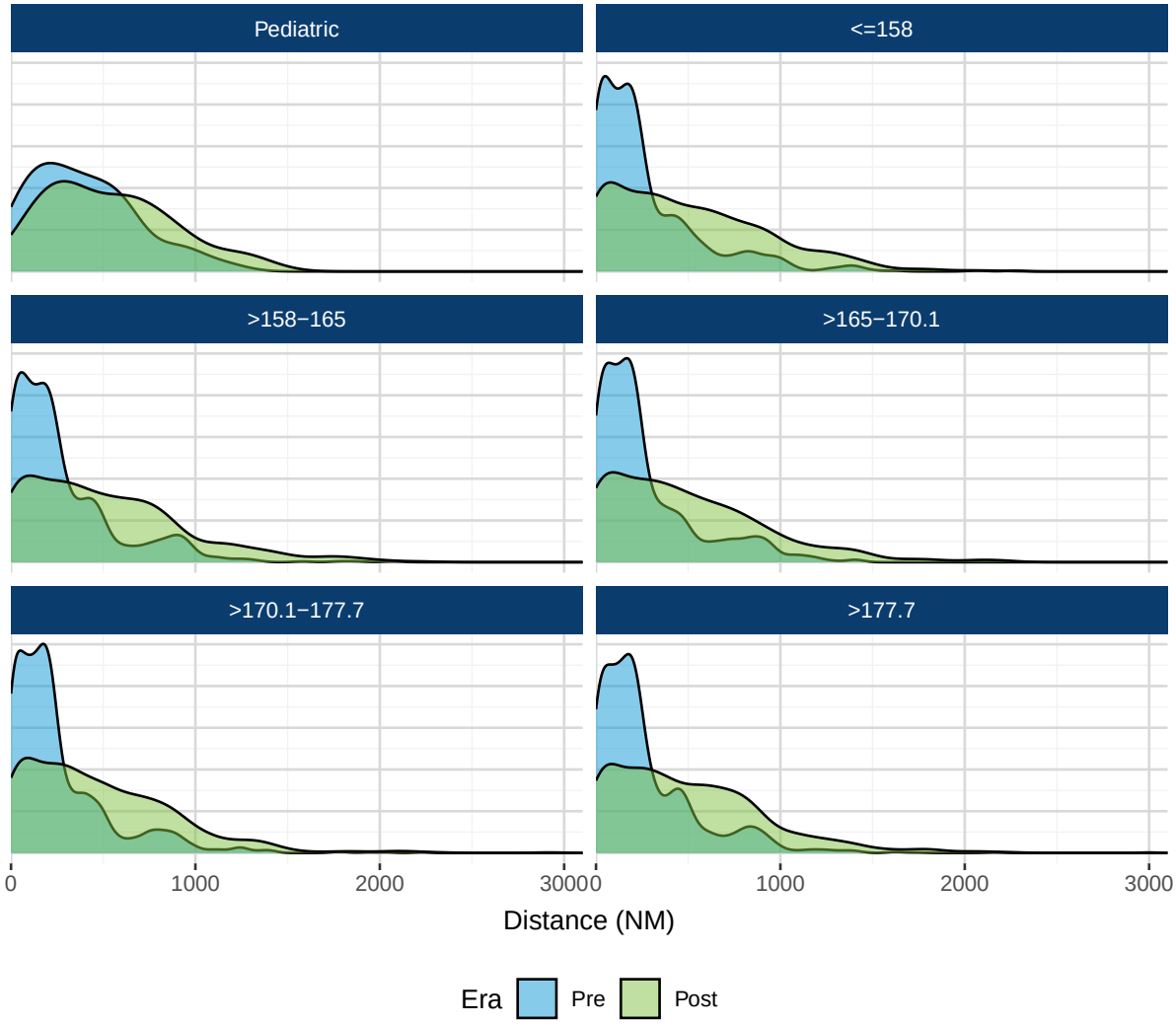
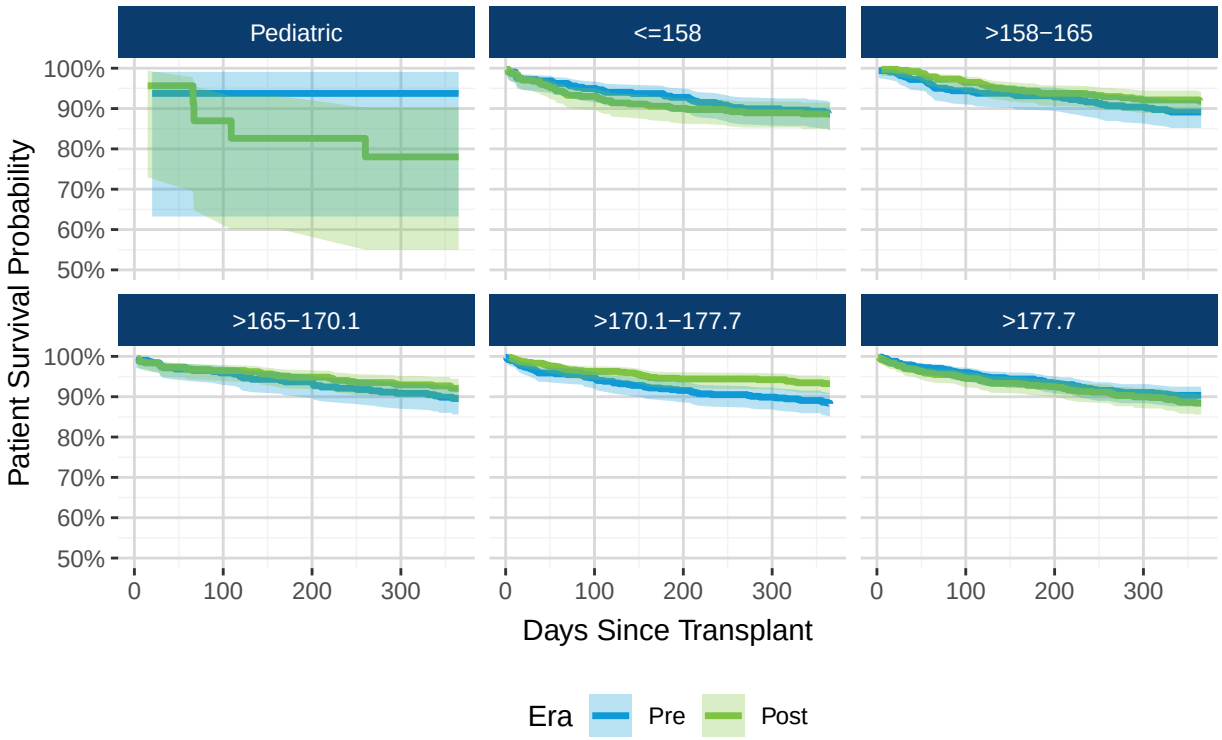


Table 41: Distribution of Distance (in Nautical Miles) from Donor Hospital to Transplant Program by Era and Height

Height (cm)	Era	N	N Missing	Min	25th Percentile	Median	Mean	75th Percentile	Max
Pediatric	Pre	45	0	0	197.00	349.0	394.44	571.00	1169
	Post	56	0	3	268.50	518.5	535.50	745.25	1384
<=158	Pre	777	0	0	66.00	182.0	264.81	371.00	2275
	Post	1041	0	0	165.00	424.0	508.48	772.00	2203
>158-165	Pre	772	0	0	71.75	193.0	272.75	379.75	2072
	Post	1035	0	0	175.50	428.0	516.91	748.50	2234
>165-170.1	Pre	844	0	0	78.00	184.5	266.09	354.00	1413
	Post	1033	0	0	161.00	409.0	496.06	733.00	2221
>170.1-177.7	Pre	1300	0	0	77.00	180.0	258.82	335.00	2225
	Post	1529	0	0	163.00	397.0	481.44	718.00	2920
>177.7	Pre	1497	0	0	81.00	193.0	269.39	377.00	2998
	Post	1697	0	0	184.00	425.0	500.92	741.00	2261
Total	Pre	5235	0	0	77.00	189.0	267.12	362.50	2998
	Post	6391	0	0	171.00	419.0	499.60	741.00	2920

Overall, no statistically significant differences in one-year post-transplant survival were observed across height categories or policy eras. However, a slight increase in the survival estimate was observed for recipients >170.1-177.7 cm tall. For pediatric recipients, the sample sizes were very small and one patient death within one year of transplant was reported in the pre-policy era. This single death in the pre-policy era resulted in a straight-line survival curve for pediatric recipients.

Figure 42: One-Year Post-Transplant Patient Survival by Era and Height



In this analysis, the pre−policy era includes transplant recipients from June 09, 2022 to March 08, 2023 and the post−policy era includes transplant recipients from March 09, 2023 to December 08, 2023.

Table 42: One-Year Post-Transplant Patient Survival by Era and Height

Height (cm)	Era	N Patients	N Deaths	1-Year Survival	95% Confidence Interval
Pediatric	Pre	16	1	93.8%	(63.2%, 99.1%)
	Post	23	5	78.0%	(55.0%, 90.2%)
<=158	Pre	318	36	88.7%	(84.6%, 91.7%)
	Post	372	42	88.7%	(85.0%, 91.5%)
>158-165	Pre	322	35	89.1%	(85.2%, 92.1%)
	Post	372	30	91.8%	(88.5%, 94.2%)
>165-170.1	Pre	318	33	89.6%	(85.6%, 92.5%)
	Post	369	29	92.1%	(88.8%, 94.4%)
>170.1-177.7	Pre	486	57	88.2%	(85.0%, 90.8%)
	Post	538	36	93.2%	(90.8%, 95.1%)
>177.7	Pre	572	55	90.3%	(87.6%, 92.5%)
	Post	599	69	88.4%	(85.6%, 90.7%)

[a] In this analysis, the pre-policy era includes transplant recipients from June 09, 2022 to March 08, 2023 and the post-policy era includes transplant recipients from March 09, 2023 to December 08, 2023.

Efficiency

Transplants

In the post era, there was an increase in the number of bilateral sequential lung procedures performed. The occurrence of other procedure types remained similar in the post era.

Figure 43: Number of Lung Transplants by Era and Procedure Type

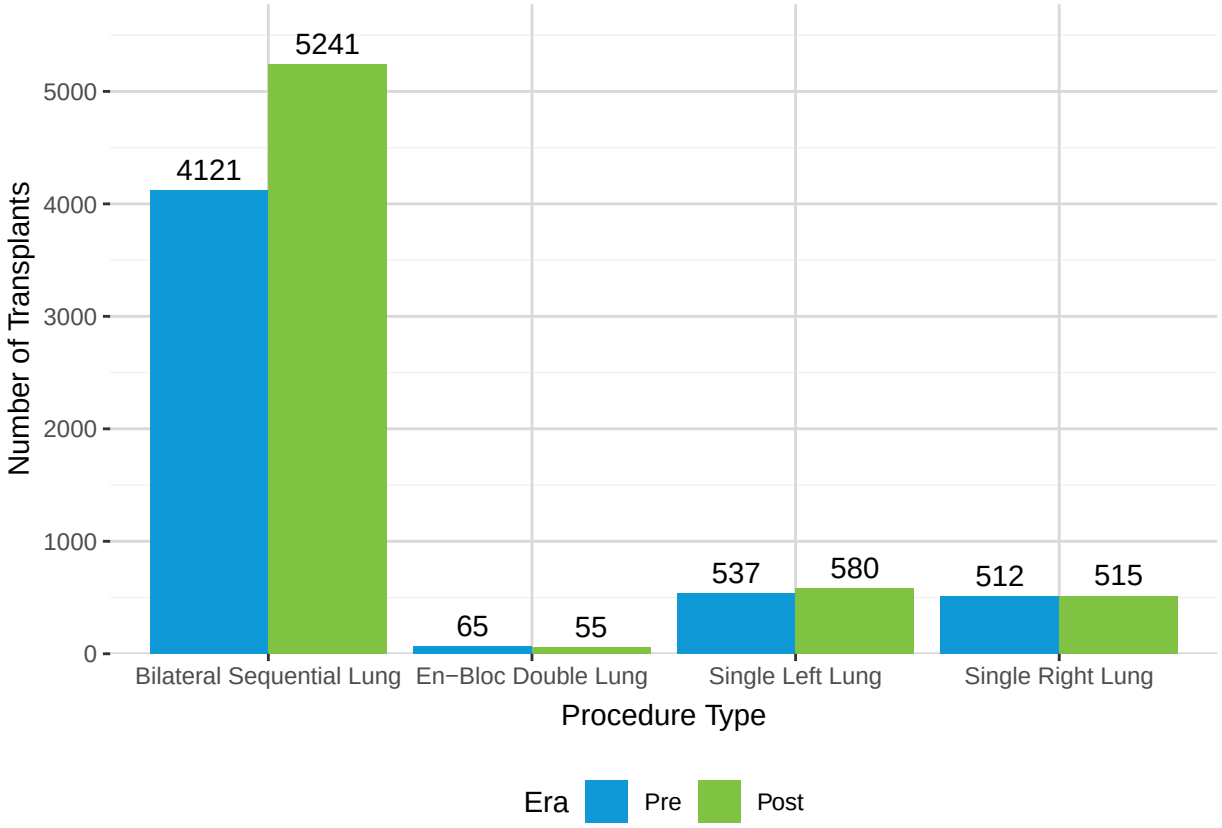


Table 43: Number of Lung Transplants by Era and Procedure Type

Procedure Type	Pre	Post
Bilateral Sequential Lung	4121 (78.7%)	5241 (82.0%)
En-Bloc Double Lung	65 (1.2%)	55 (0.9%)
Single Left Lung	537 (10.3%)	580 (9.1%)
Single Right Lung	512 (9.8%)	515 (8.1%)
Total	5235 (100.0%)	6391 (100.0%)

The percent of machine perfused lungs increased or remained similar in the post era in 7 OPTN regions and decreased in the remaining 4 OPTN regions.

Figure 44: Percent of Machine Perfused Lungs by Era and Donor OPTN Region Out of All Lungs Recovered for Transplant

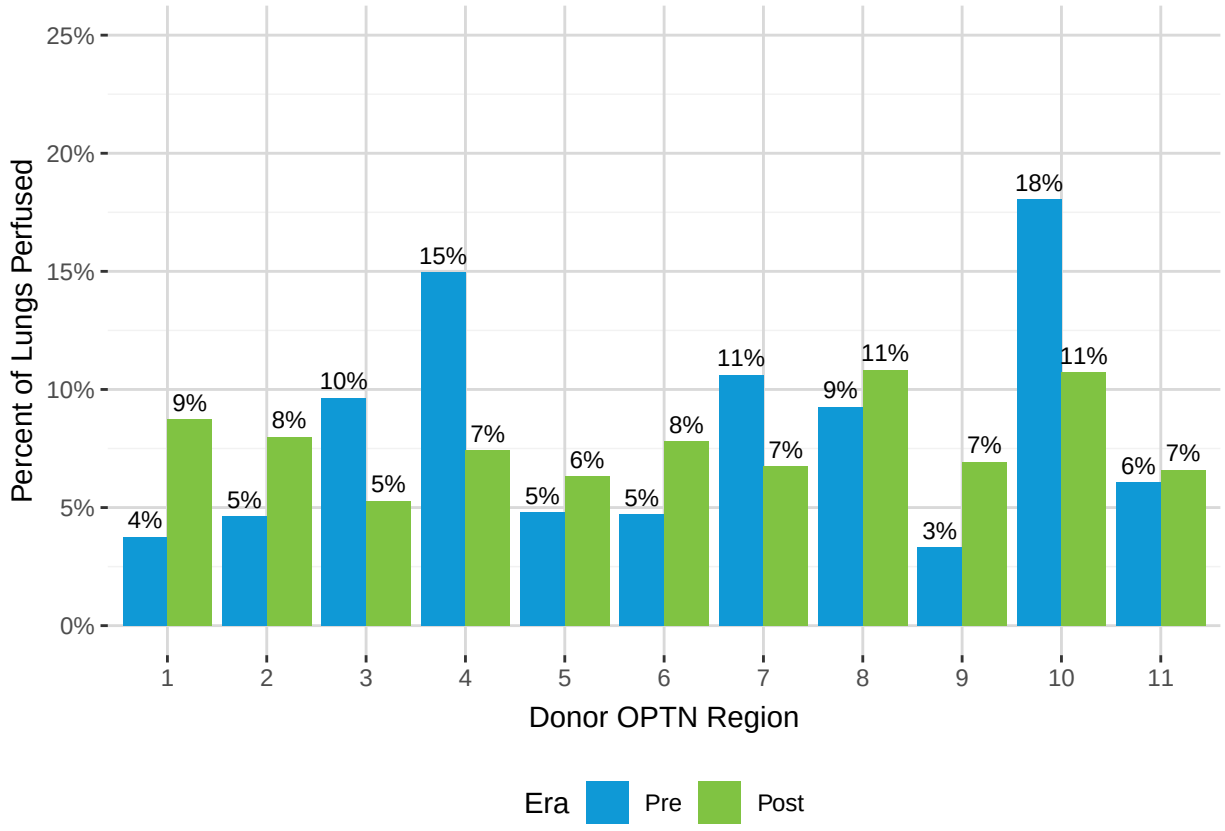


Table 44: Percent of Machine Perfused Lungs by Era and Donor OPTN Region Out of All Lungs Recovered for Transplant

Donor OPTN Region	Era	N Lungs Recovered	N Lungs Perfused	Percent Lungs Perfused
1	Pre	266	10	3.8%
	Post	321	28	8.7%
2	Pre	910	42	4.6%
	Post	1100	88	8.0%
3	Pre	1680	162	9.6%
	Post	2175	115	5.3%
4	Pre	1517	227	15.0%
	Post	1847	137	7.4%
5	Pre	1586	76	4.8%
	Post	2135	135	6.3%
6	Pre	361	17	4.7%
	Post	589	46	7.8%
7	Pre	885	94	10.6%
	Post	1053	71	6.7%
8	Pre	864	80	9.3%
	Post	1117	121	10.8%
9	Pre	392	13	3.3%
	Post	533	37	6.9%
10	Pre	1075	194	18.0%
	Post	1333	143	10.7%
11	Pre	1219	74	6.1%
	Post	1471	97	6.6%
All Regions	Pre	10755	989	9.2%
	Post	13674	1018	7.4%

In the post-policy era, median distance from the donor hospital to transplant program increased for both DCD organs and non-DCD organs.

Figure 45: Distribution of Distance (in Nautical Miles) from Donor Hospital to Transplant Program by Era and Donor Type

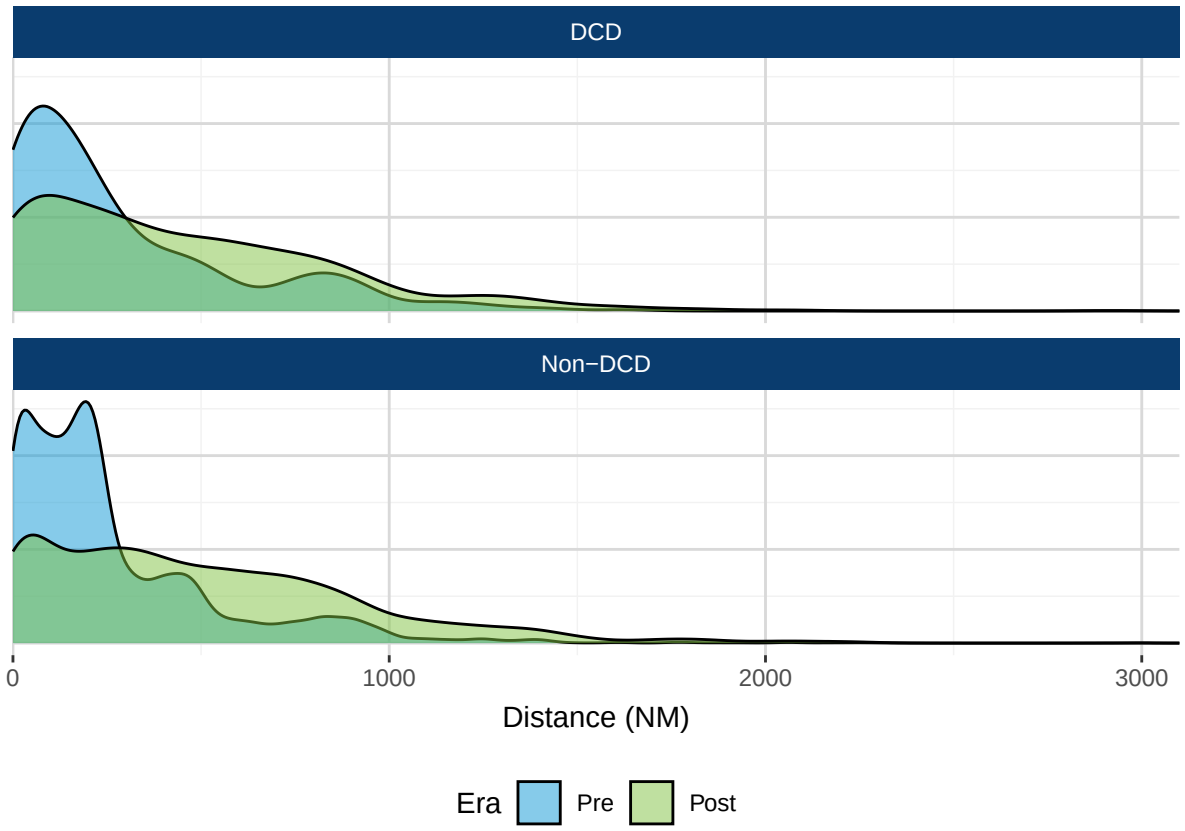


Table 45: Distribution of Distance (in Nautical Miles) from Donor Hospital to Transplant Program by Era and Donor Type

Donor Type	Era	N	N Missing	Min	25th Percentile	Median	Mean	75th Percentile	Max
DCD	Pre	401	0	0	56.00	173.0	290.04	426.00	1624
	Post	806	0	0	130.25	364.5	455.66	697.75	2920
Non-DCD	Pre	4834	0	0	77.00	190.0	265.22	359.00	2998
	Post	5585	0	0	178.00	426.0	505.94	750.00	2920
Total	Pre	5235	0	0	77.00	189.0	267.12	362.50	2998
	Post	6391	0	0	171.00	419.0	499.60	741.00	2920

Utilization Rate

Utilization rate is defined as the percent of lungs that are transplanted based on all possible lungs from every deceased donor with at least one organ recovered for the purpose of transplant; this definition assumes that each donor has two possible lungs for donation.

Utilization rates increased slightly for both DCD and non-DCD donors in the post-policy era.

Figure 46: Donor Utilization Rates by Era and Donor Type

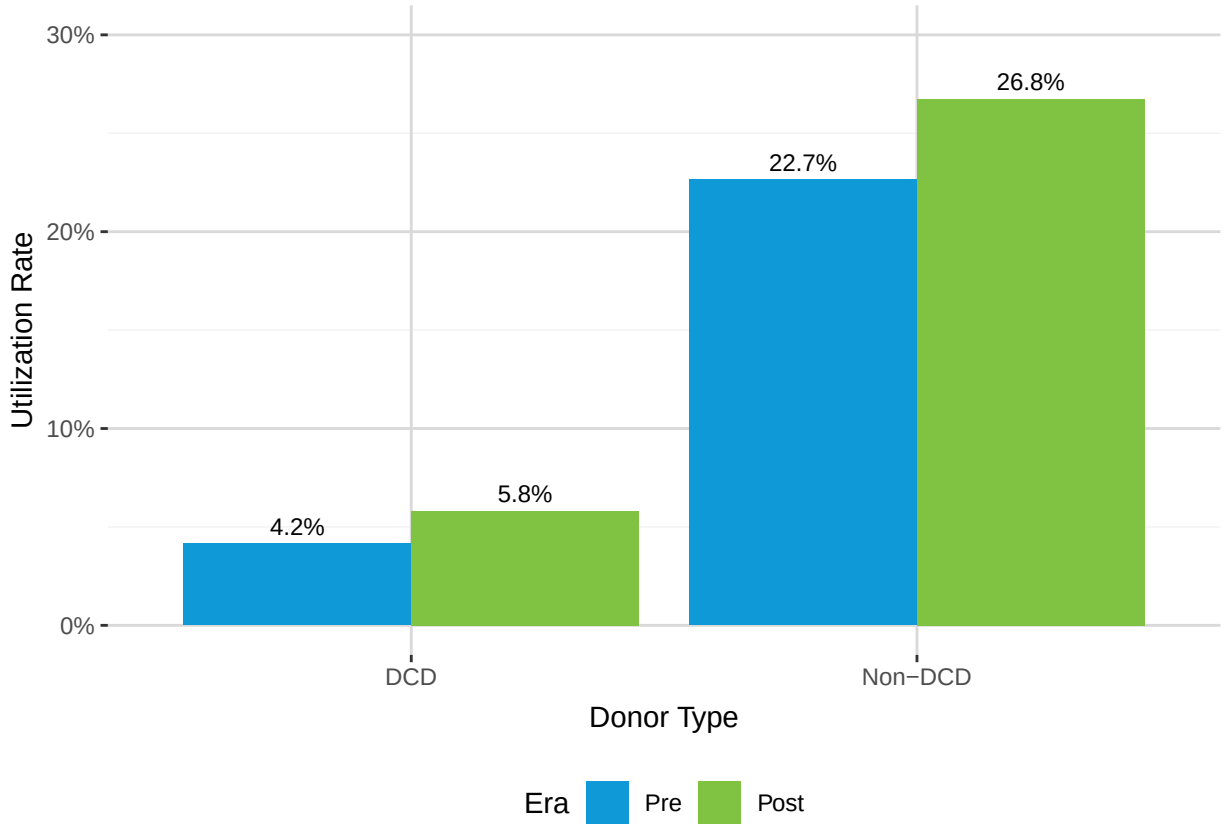


Table 46: Donor Utilization Rates by Era and Donor Type

DCD Status	Era	N Donors	N Lungs Transplanted	Utilization Rate
DCD	Pre	9238	767	4.2%
	Post	13710	1592	5.8%
Non-DCD	Pre	20001	9062	22.7%
	Post	19929	10665	26.8%
All Donors	Pre	29239	9829	16.8%
	Post	33639	12257	18.2%

Non-Use Rate

Non-use rate is defined as the percent of lungs recovered for the purpose of transplant but not transplanted out of all lungs recovered for transplant.

Non-use rates remained similar for DCD and non-DCD donors. However, the number of lungs recovered from DCD donors increased by 109%.

Figure 47: Donor Non-Use Rates by Era and Donor Type

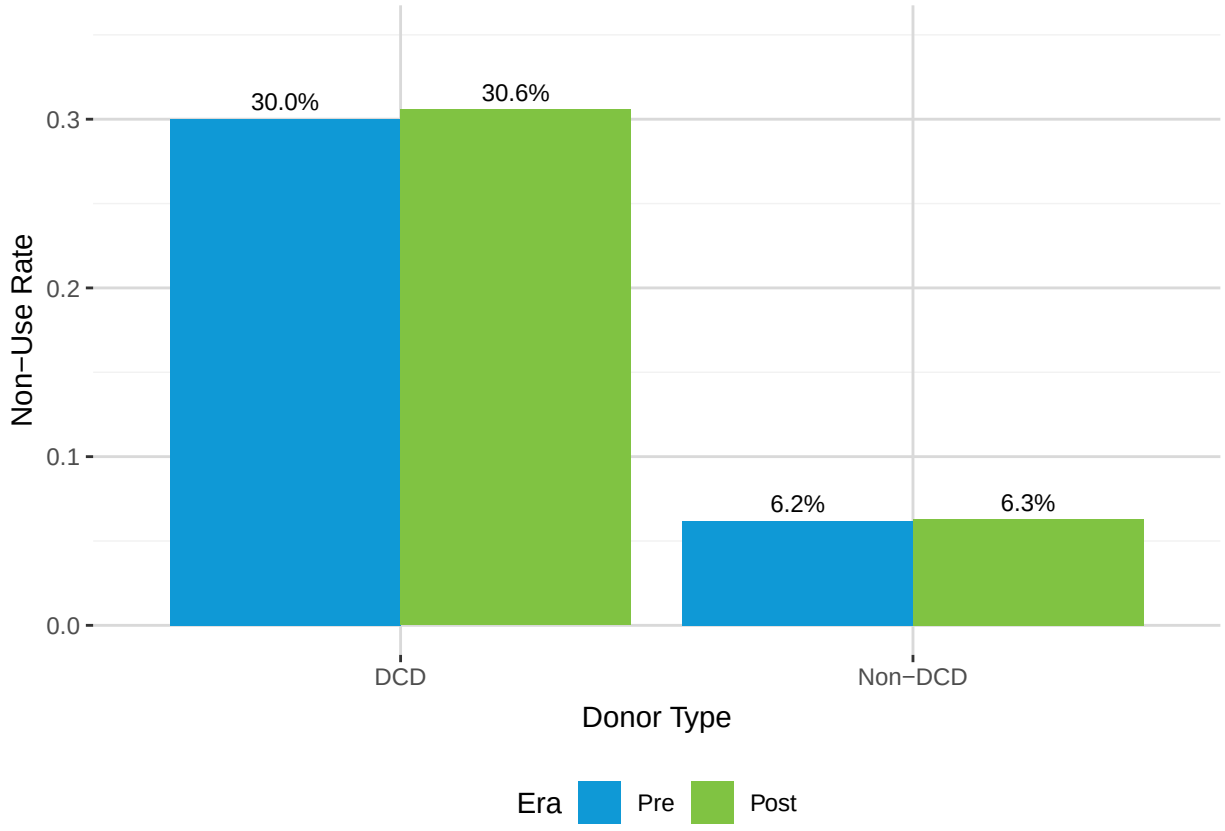


Table 47: Donor Non-Use Rates by Era and Donor Type

DCD Status	Era	N Lungs Recovered	N Lungs Transplanted	Non-Use Rate
DCD	Pre	1096	767	30.0%
	Post	2293	1592	30.6%
Non-DCD	Pre	9659	9062	6.2%
	Post	11381	10665	6.3%
All Donors	Pre	10755	9829	8.6%
	Post	13674	12257	10.4%

Match Run Efficiency

In the post era, more programs received organ offers on a match run. The median number of unique programs offered up to the final acceptor increased from 4 to 10.

Figure 48: Distribution of the Number of Unique Programs Offered Up To the Final Acceptor on Lung Match Run by Era

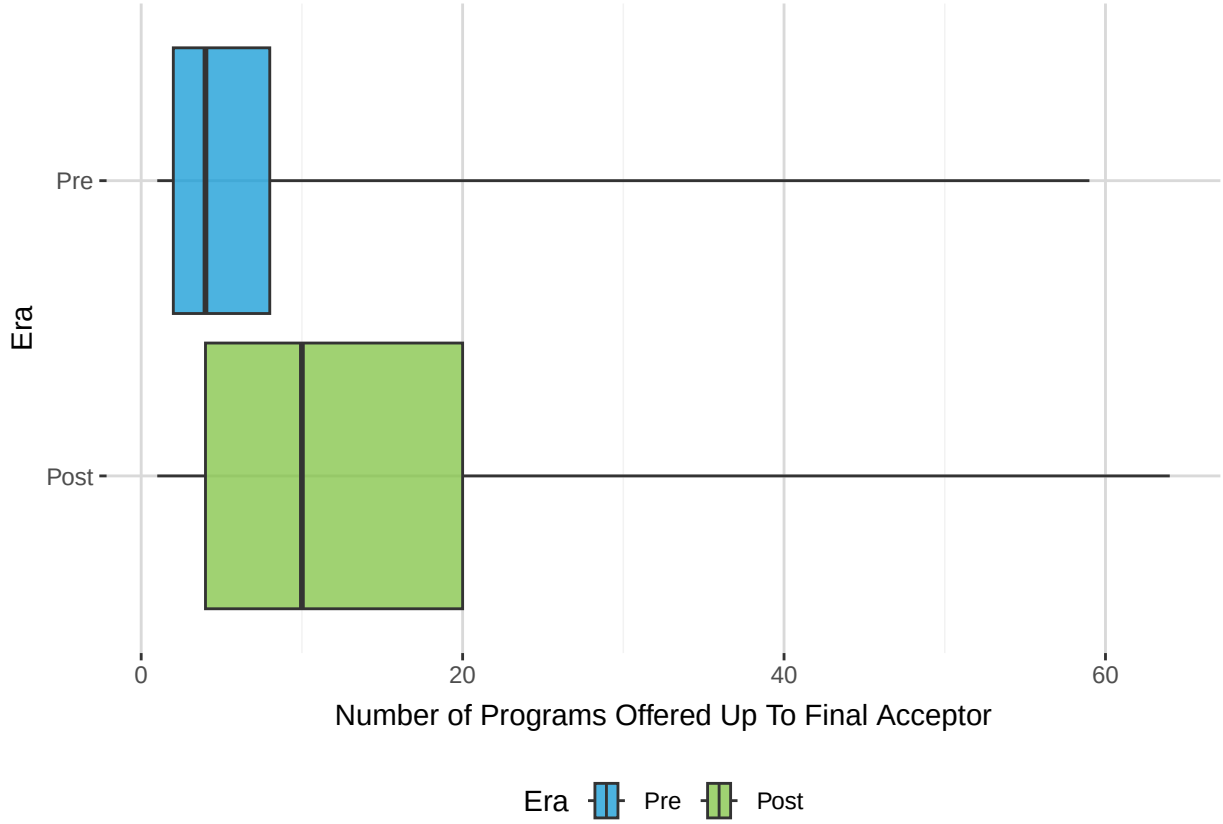


Table 48: Distribution of the Number of Unique Programs Offered Up To the Final Acceptor on Lung Match Run by Era

Era	N	N Missing	Min	25th Percentile	Median	Mean	75th Percentile	Max
Pre	5592	0	1	2	4	6.30	8	59
Post	6711	0	1	4	10	14.12	20	64

In the post era, more programs received their first organ offers after the final acceptance. The median number of programs that received their first organ offer after the sequence number of the final acceptor increased from 7 to 11.

Figure 49: Distribution of the Number of Unique Programs Offered Only After the Final Acceptor on Lung Match Run by Era

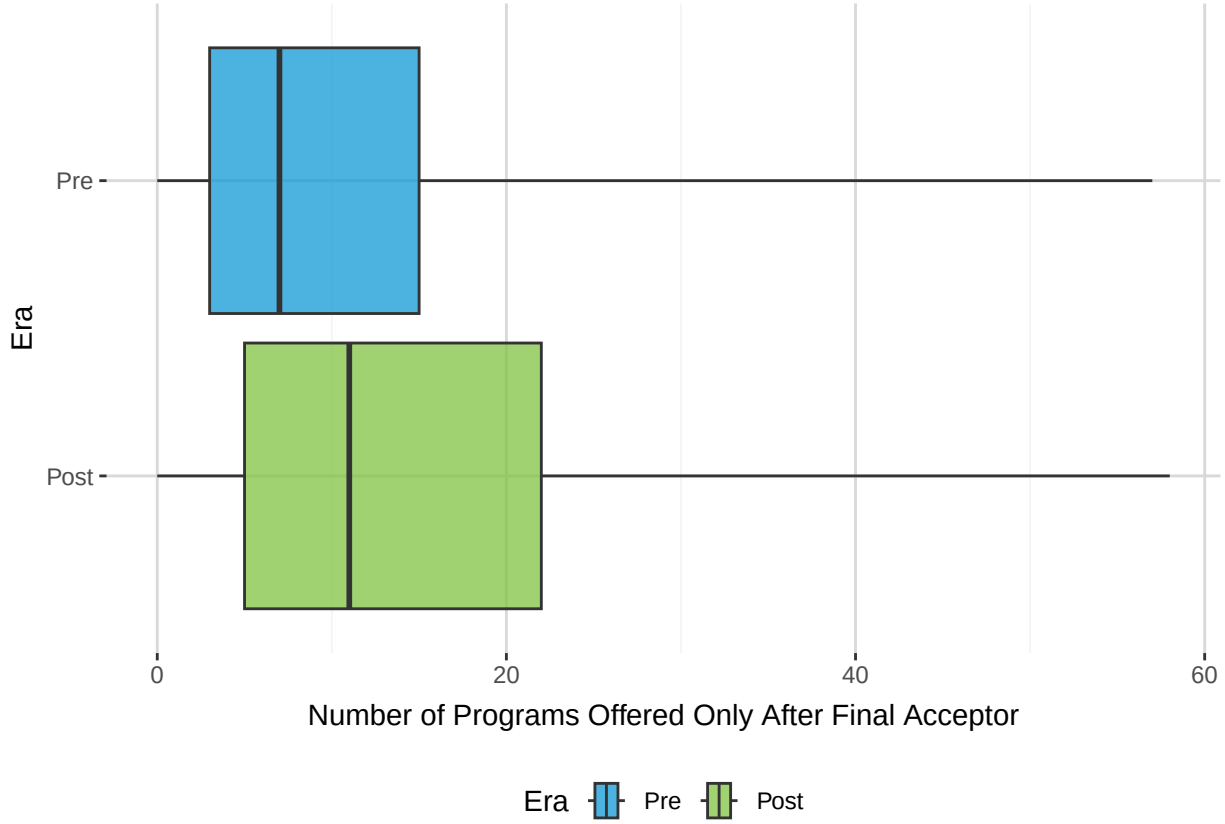


Table 49: Distribution of the Number of Unique Programs Offered Only After the Final Acceptor on Lung Match Run by Era

Era	N	N Missing	Min	25th Percentile	Median	Mean	75th Percentile	Max
Pre	5592	0	0	3	7	10.90	15	57
Post	6711	0	0	5	11	14.38	22	58

Exceptions

The National Lung Review Board experienced a large increase in the quantity of exception requests submitted when continuous distribution (CD) was implemented. Under LAS, a single registration could only have one exception request associated with it. Under CD, a single registration can have multiple exception requests, provided the exception requests are under different goals.

Prior to CD implementation, programs could submit CAS exception requests through an interim process so that those requests, if approved, would be in place at the start of implementation. 26 requests were submitted through this process and were not included in the below charts. In the charts below, all LAS requests were submitted prior to lung CD implementation and all CAS requests were submitted after CD implementation.

The figure and table below show the number of registrations with at least one exception request submitted by era and diagnosis group. Multiple exception requests can be submitted for a single registration. For diagnosis groups A, B, and D there were more registrations with submitted exception requests in the post-policy era compared to the pre-policy era.

Figure 50: Number of Lung Registrations with at Least One Exception Request Submitted by Era and Diagnosis Group

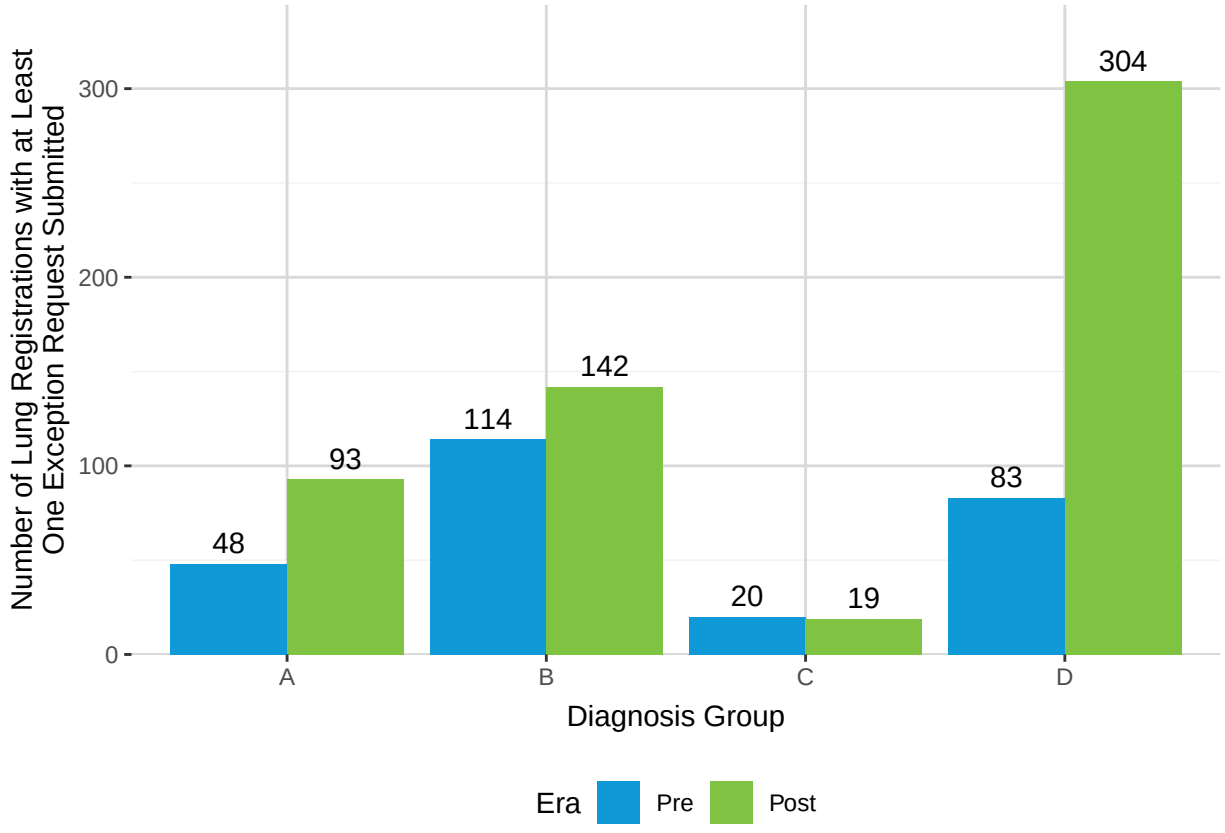


Table 50: Number of Lung Registrations with at Least One Exception Request Submitted by Era and Diagnosis Group

Diagnosis Group	Pre	Post
A	48 (18.1%)	93 (16.7%)
B	114 (43.0%)	142 (25.4%)
C	20 (7.5%)	19 (3.4%)
D	83 (31.3%)	304 (54.5%)
Total	265 (100.0%)	558 (100.0%)

The number of registrations with at least one exception request submitted increased or remained stable across all regions.

Figure 51: Number of Lung Registrations with at Least One Exception Request Submitted by Era and Listing Region

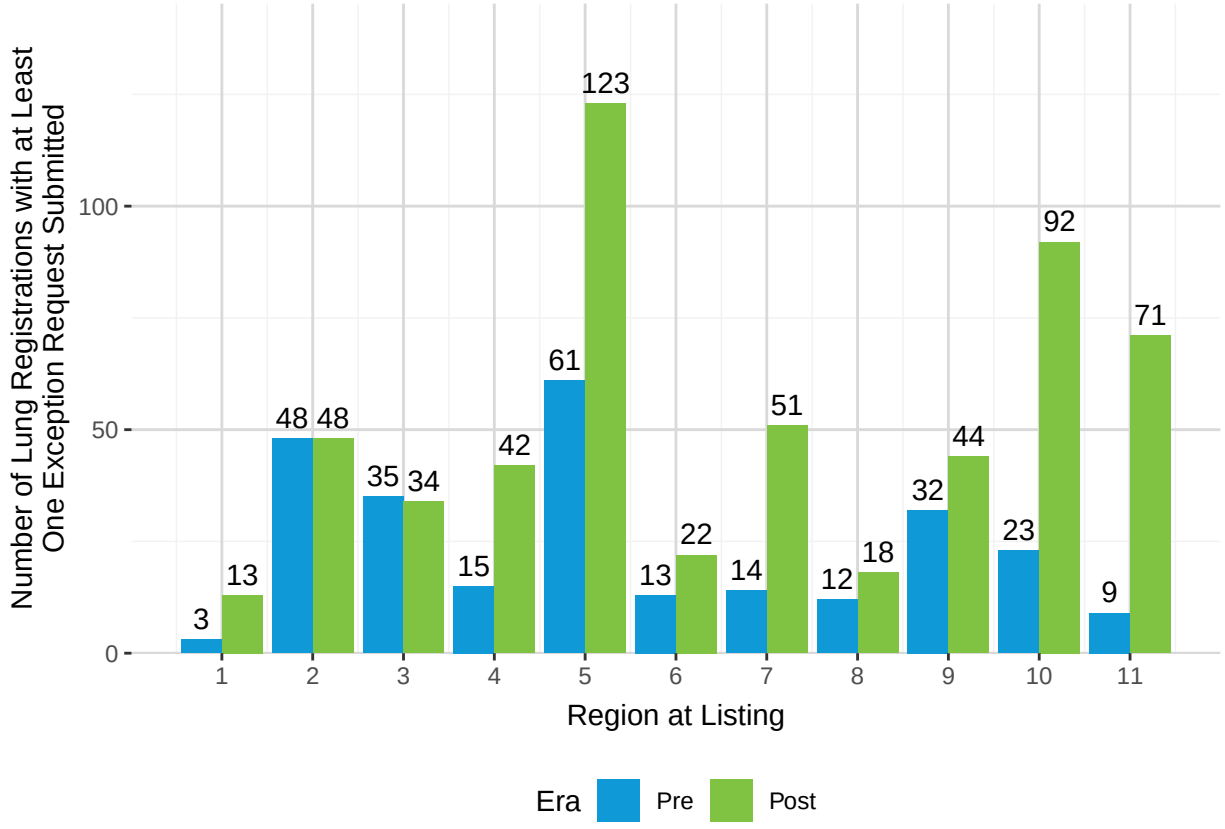
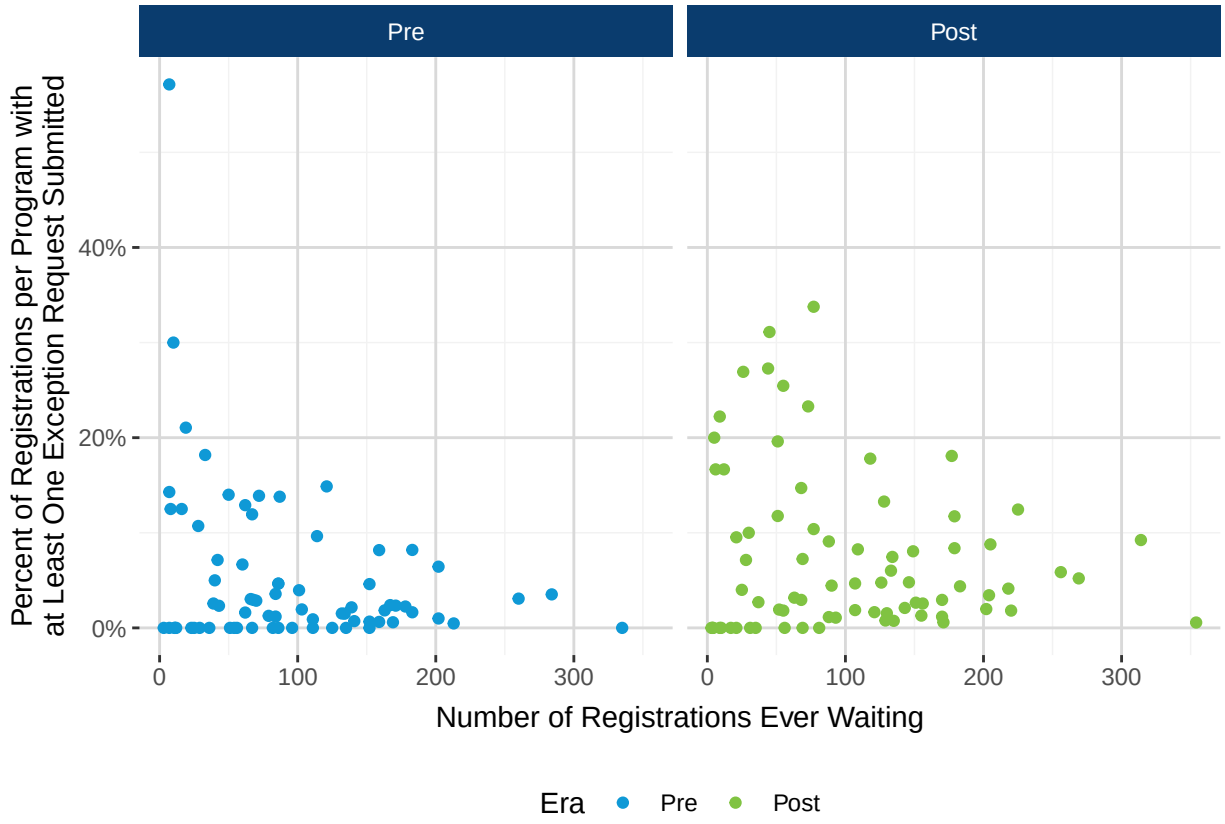


Table 51: Number of Lung Registrations with at Least One Exception Request Submitted by Era and Listing Region

Region at Listing	Pre	Post
1	3 (1.1%)	13 (2.3%)
2	48 (18.1%)	48 (8.6%)
3	35 (13.2%)	34 (6.1%)
4	15 (5.7%)	42 (7.5%)
5	61 (23.0%)	123 (22.0%)
6	13 (4.9%)	22 (3.9%)
7	14 (5.3%)	51 (9.1%)
8	12 (4.5%)	18 (3.2%)
9	32 (12.1%)	44 (7.9%)
10	23 (8.7%)	92 (16.5%)
11	9 (3.4%)	71 (12.7%)
Total	265 (100.0%)	558 (100.0%)

The figure below shows the percent of registrations per program with at least one exception request submitted by program size and era. The percent of registrations per program with at least one exception request submitted increased after CD was implemented, primarily in small and medium-sized programs.

Figure 52: Percent of Registrations Ever Waiting at a Program with at Least One Exception Request Submitted by Era and Program Size



The following figure shows the relationship between the percent of registrations per program with a submitted exception request in the pre era compared to the post era. Points above the black line represent programs with a higher percent of registrations with at least one exception request submitted in the post era compared to the pre era. Conversely, points below the black line represent programs with a higher percent of registrations with at least one exception request submitted in the pre era compared to the post era. The size of the points represents the number of registrations ever waiting at the program in the pre era.

Figure 53: Change in the Percent of Registrations Ever Waiting with at Least One Exception Request Submitted at a Program by Era

Candidates in diagnosis group B with an approved exception made up a slightly higher percent of candidates removed from the waiting list for death or too sick in the post-policy era compared to the pre-policy era.

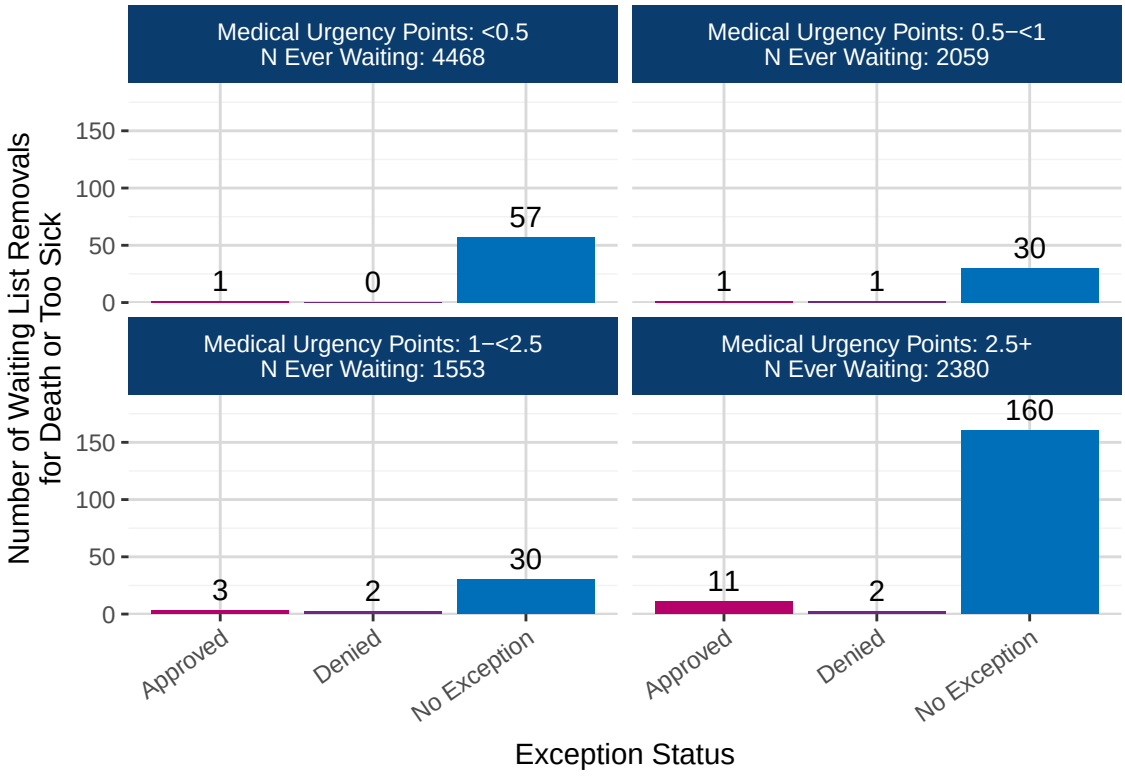
Figure 54: Number of Candidates Removed from the Waiting List for Death or Too Sick by Era, Diagnosis Group, and Exception Status

Table 52: Number of Candidates Removed from the Waiting List for Death or Too Sick by Era, Diagnosis Group, and Exception Status

Diagnosis Group	Era	Exception Approved	Exception Denied	No Exception	Total
A	Pre	2 (2.8%)	1 (1.4%)	68 (95.8%)	71 (100.0%)
	Post	1 (2.0%)	1 (2.0%)	49 (96.1%)	51 (100.0%)
B	Pre	8 (25.0%)	1 (3.1%)	23 (71.9%)	32 (100.0%)
	Post	7 (31.8%)	0 (0.0%)	15 (68.2%)	22 (100.0%)
C	Pre	1 (25.0%)	0 (0.0%)	3 (75.0%)	4 (100.0%)
	Post	0 (0.0%)	0 (0.0%)	2 (100.0%)	2 (100.0%)
D	Pre	6 (1.6%)	1 (0.3%)	378 (98.2%)	385 (100.0%)
	Post	8 (3.6%)	4 (1.8%)	211 (94.6%)	223 (100.0%)

In the post-policy era, five candidates that were removed from the waiting list for death or too sick to transplant had denied exception requests.

Figure 55: Number of Candidates Removed from the Waiting List for Death or Too Sick by Medical Urgency Points and Exception Status in the Post-Policy Era



'N Ever Waiting' counts are based on the number of candidates who were ever in that Medical Urgency Points category during their registration. A single candidate may be included in multiple Medical Urgency Points categories if their medical urgency score changed during their registration. However, removals are only counted once and are based on the Medical Urgency Points at the time of removal.

Table 53: Number of Candidates Removed from the Waiting List for Death or Too Sick by Medical Urgency Points and Exception Status in the Post-Policy Era

	Number of Removals for Death or Too Sick		
Medical Urgency Points	No Exception	Approved	Denied
<0.5	57	1	0
0.5-<1	30	1	1
1-<2.5	30	3	2
2.5+	160	11	2

The following figures and tables examine data at the exception form level. Each registration can have multiple exception requests in the post-policy era.

The majority of exception requests were submitted for the medical urgency goal in the post-policy era.

Figure 56: Number of Lung Exception Requests Submitted by Exception Status and Goal in the Post-Policy Era

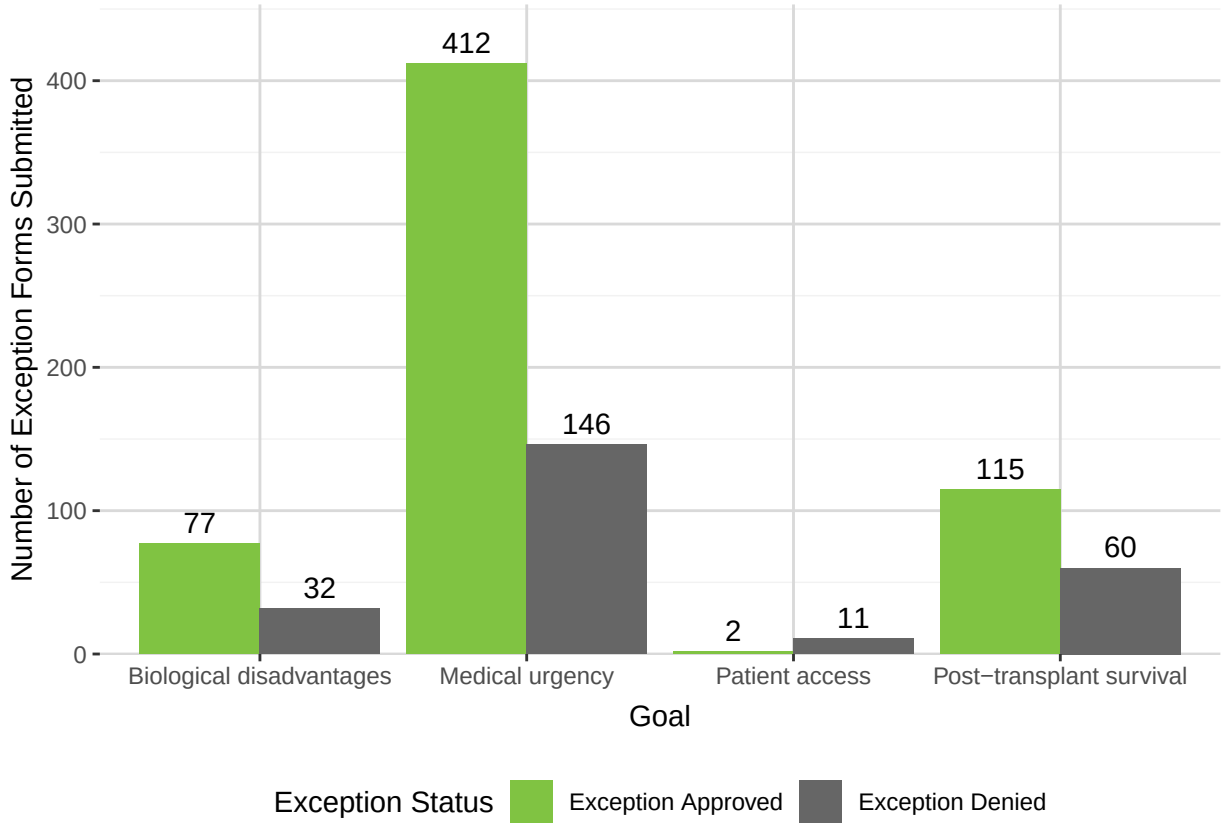


Table 54: Number of Lung Exception Requests Submitted by Exception Status and Goal in the Post-Policy Era

Goal	Exception Approved	Exception Denied
Biological disadvantages	77 (12.7%)	32 (12.9%)
Medical urgency	412 (68.0%)	146 (58.6%)
Patient access	2 (0.3%)	11 (4.4%)
Post-transplant survival	115 (19.0%)	60 (24.1%)
Total	606 (100.0%)	249 (100.0%)

A large number of exception requests were submitted at the start of continuous distribution and immediately before the ABO Modification in September 2023. The number of requests submitted per month has leveled out since the implementation of the ABO Modification. In the last five months of the reporting timeframe, there has been a small increase in the number of biological disadvantages exception requests submitted.

Figure 57: Number of Lung Exception Requests Submitted by Month of Submission and Goal in the Post-Policy Era

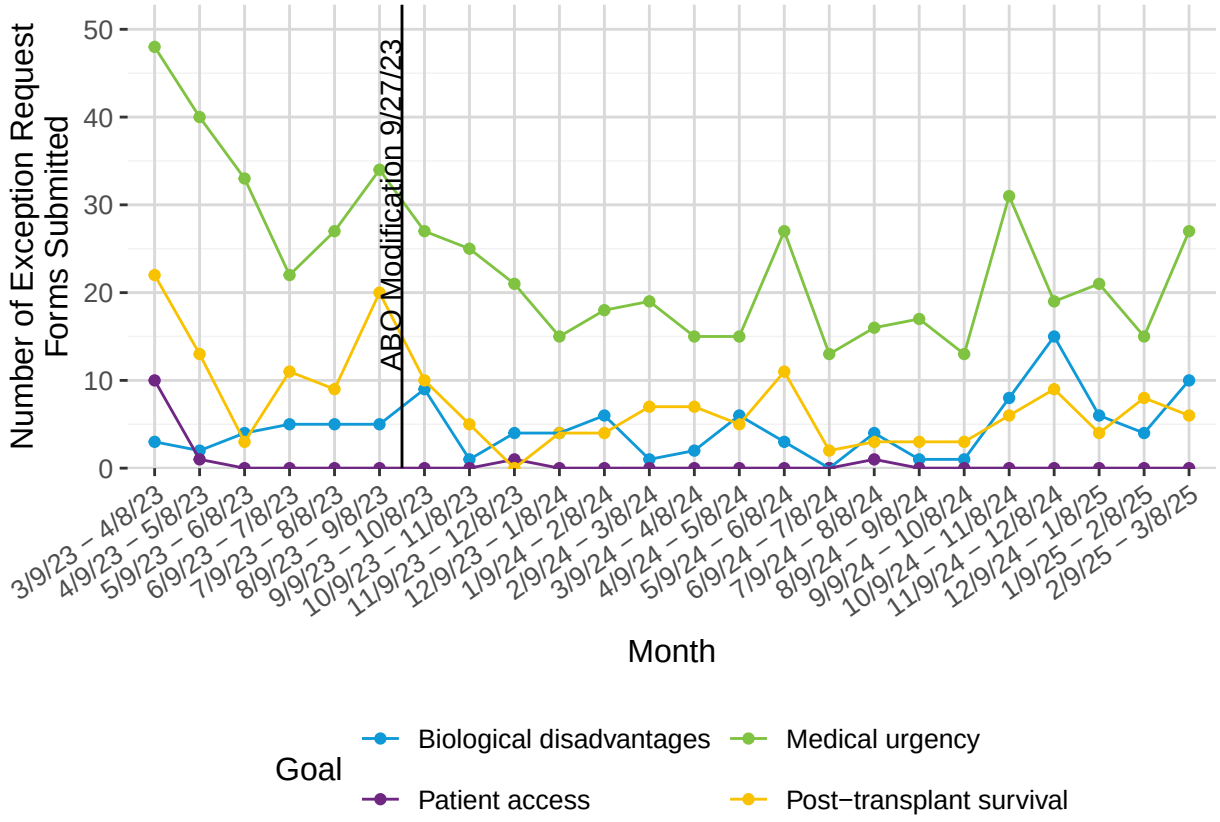


Table 55: Number of Lung Exception Requests Submitted by Month of Submission and Goal in the Post-Policy Era

Month	Biological Disadvantages	Medical Urgency	Patient Access	Post-Transplant Survival	Total
3/9/23 - 4/8/23	3 (3.6%)	48 (57.8%)	10 (12.0%)	22 (26.5%)	83 (100.0%)
4/9/23 - 5/8/23	2 (3.6%)	40 (71.4%)	1 (1.8%)	13 (23.2%)	56 (100.0%)
5/9/23 - 6/8/23	4 (10.0%)	33 (82.5%)	0 (0.0%)	3 (7.5%)	40 (100.0%)
6/9/23 - 7/8/23	5 (13.2%)	22 (57.9%)	0 (0.0%)	11 (28.9%)	38 (100.0%)
7/9/23 - 8/8/23	5 (12.2%)	27 (65.9%)	0 (0.0%)	9 (22.0%)	41 (100.0%)
8/9/23 - 9/8/23	5 (8.5%)	34 (57.6%)	0 (0.0%)	20 (33.9%)	59 (100.0%)
9/9/23 - 10/8/23	9 (19.6%)	27 (58.7%)	0 (0.0%)	10 (21.7%)	46 (100.0%)
10/9/23 - 11/8/23	1 (3.2%)	25 (80.6%)	0 (0.0%)	5 (16.1%)	31 (100.0%)
11/9/23 - 12/8/23	4 (15.4%)	21 (80.8%)	1 (3.8%)	0 (0.0%)	26 (100.0%)
12/9/23 - 1/8/24	4 (17.4%)	15 (65.2%)	0 (0.0%)	4 (17.4%)	23 (100.0%)
1/9/24 - 2/8/24	6 (21.4%)	18 (64.3%)	0 (0.0%)	4 (14.3%)	28 (100.0%)
2/9/24 - 3/8/24	1 (3.7%)	19 (70.4%)	0 (0.0%)	7 (25.9%)	27 (100.0%)
3/9/24 - 4/8/24	2 (8.3%)	15 (62.5%)	0 (0.0%)	7 (29.2%)	24 (100.0%)
4/9/24 - 5/8/24	6 (23.1%)	15 (57.7%)	0 (0.0%)	5 (19.2%)	26 (100.0%)
5/9/24 - 6/8/24	3 (7.3%)	27 (65.9%)	0 (0.0%)	11 (26.8%)	41 (100.0%)
6/9/24 - 7/8/24	0 (0.0%)	13 (86.7%)	0 (0.0%)	2 (13.3%)	15 (100.0%)
7/9/24 - 8/8/24	4 (16.7%)	16 (66.7%)	1 (4.2%)	3 (12.5%)	24 (100.0%)
8/9/24 - 9/8/24	1 (4.8%)	17 (81.0%)	0 (0.0%)	3 (14.3%)	21 (100.0%)
9/9/24 - 10/8/24	1 (5.9%)	13 (76.5%)	0 (0.0%)	3 (17.6%)	17 (100.0%)
10/9/24 - 11/8/24	8 (17.8%)	31 (68.9%)	0 (0.0%)	6 (13.3%)	45 (100.0%)
11/9/24 - 12/8/24	15 (34.9%)	19 (44.2%)	0 (0.0%)	9 (20.9%)	43 (100.0%)
12/9/24 - 1/8/25	6 (19.4%)	21 (67.7%)	0 (0.0%)	4 (12.9%)	31 (100.0%)
1/9/25 - 2/8/25	4 (14.8%)	15 (55.6%)	0 (0.0%)	8 (29.6%)	27 (100.0%)
2/9/25 - 3/8/25	10 (23.3%)	27 (62.8%)	0 (0.0%)	6 (14.0%)	43 (100.0%)

Multiorgan

The sample sizes for lung-multiorgan candidates and recipients are currently too small to definitively determine implications of the policy change; however, below we describe trends we are observing so far.

The most common lung-multiorgan transplants were heart/lung, lung/kidney, and lung/liver. All other lung-multiorgan types included lung and two other organs, one of which was usually heart. Multiorgan combinations including the heart are usually allocated off the heart match run and therefore CD is not expected to impact their allocation. Due to small sample sizes, the remaining charts in this section group heart/lung/liver, heart/lung/kidney, lung/liver/kidney, and other candidates listed for three or more organs into one group called "Lung/Multiple Organs".

Figure 58: Number of Lung-Multiorgan Transplants by Lung-Multiorgan Type

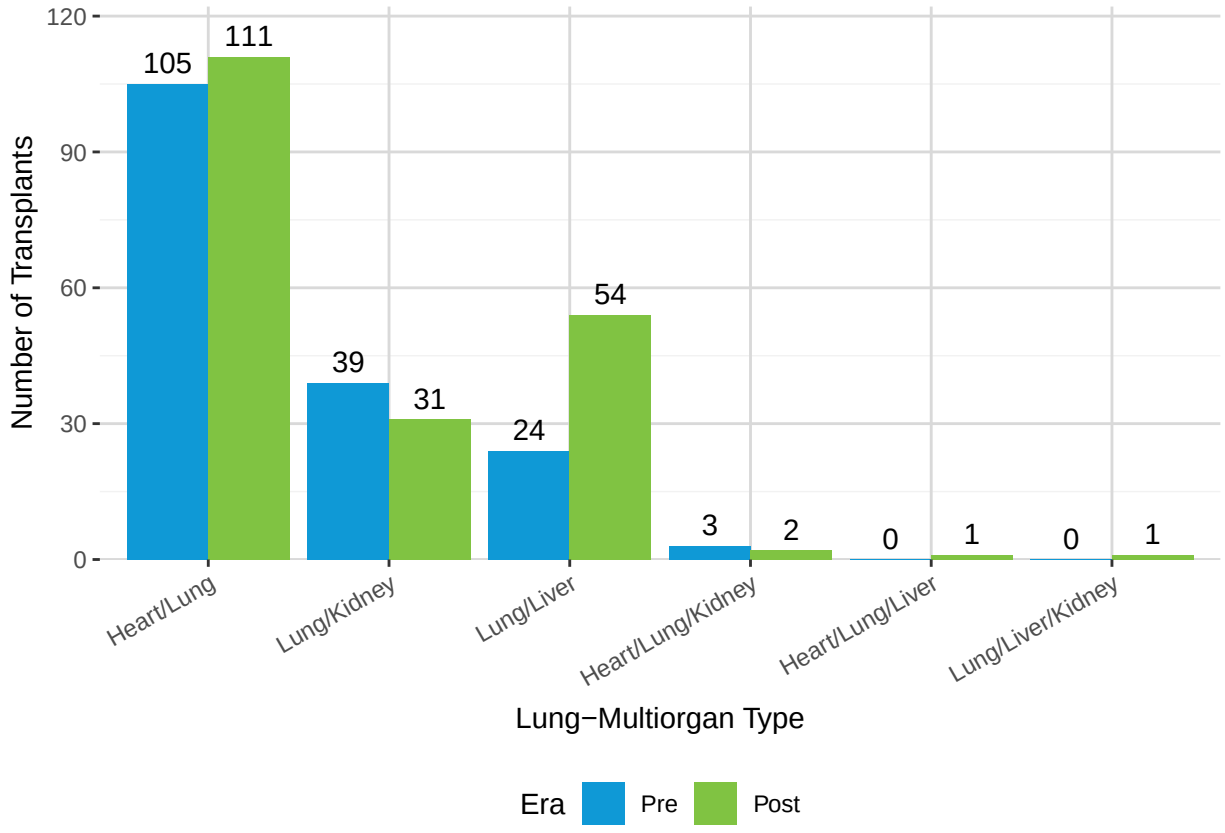
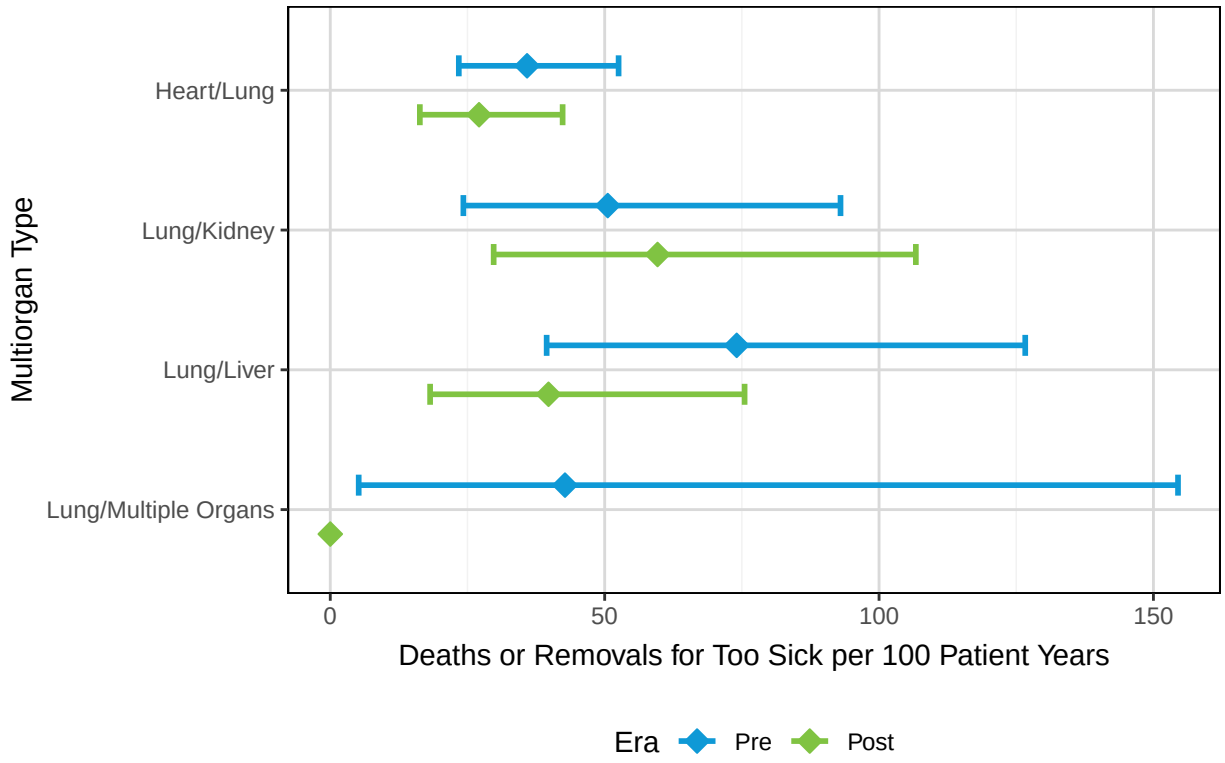


Table 56: Number of Lung-Multiorgan Transplants by Lung-Multiorgan Type

Lung-Multiorgan Type	Pre	Post
Heart/Lung	105 (61.4%)	111 (55.5%)
Lung/Kidney	39 (22.8%)	31 (15.5%)
Lung/Liver	24 (14.0%)	54 (27.0%)
Heart/Lung/Kidney	3 (1.8%)	2 (1.0%)
Heart/Lung/Liver	0 (0.0%)	1 (0.5%)
Lung/Liver/Kidney	0 (0.0%)	1 (0.5%)
Total	171 (100.0%)	200 (100.0%)

The number of deaths or removals for too sick per 100 patient years decreased slightly for lung/liver candidates and remained similar for heart/lung and lung/kidney candidates, though sample sizes were small. No rate estimate confidence intervals were provided for lung/multiple organ candidates in the post era because no candidates were removed for death or too sick in this era.

Figure 59: Deaths or Removals for Too Sick per 100 Patient Years on the Waiting List by Era and Multiorgan Type



No rate estimate is provided for Lung/Multiple Organ candidates in the post era because no candidates were removed for death or too sick

Table 57: Deaths or Removals for Too Sick per 100 Patient Years on the Waiting List by Era and Multiorgan Type

Multiorgan Type	Era	N Patients	Deaths or Removals for Too Sick per 100 Patient Years	95% Confidence Interval
Heart/Lung	Pre	180	35.86	(23.42, 52.54)
	Post	183	27.11	(16.32, 42.34)
Lung/Kidney	Pre	71	50.56	(24.25, 92.98)
	Post	65	59.64	(29.77, 106.71)
Lung/Liver	Pre	50	74.06	(39.43, 126.64)
	Post	79	39.77	(18.19, 75.50)
Lung/Multiple Organs	Pre	11	42.77	(5.18, 154.48)
	Post	14	0.00	–

In the post-policy era the transplant rate increased slightly for lung/liver candidates, decreased slightly for lung/kidney candidates, and remained similar for heart/lung and lung/multiple organs candidates, though sample sizes were small.

Figure 60: Lung-Multiorgan Transplants per 100 Patient Years on the Waiting List by Era and Multiorgan Type

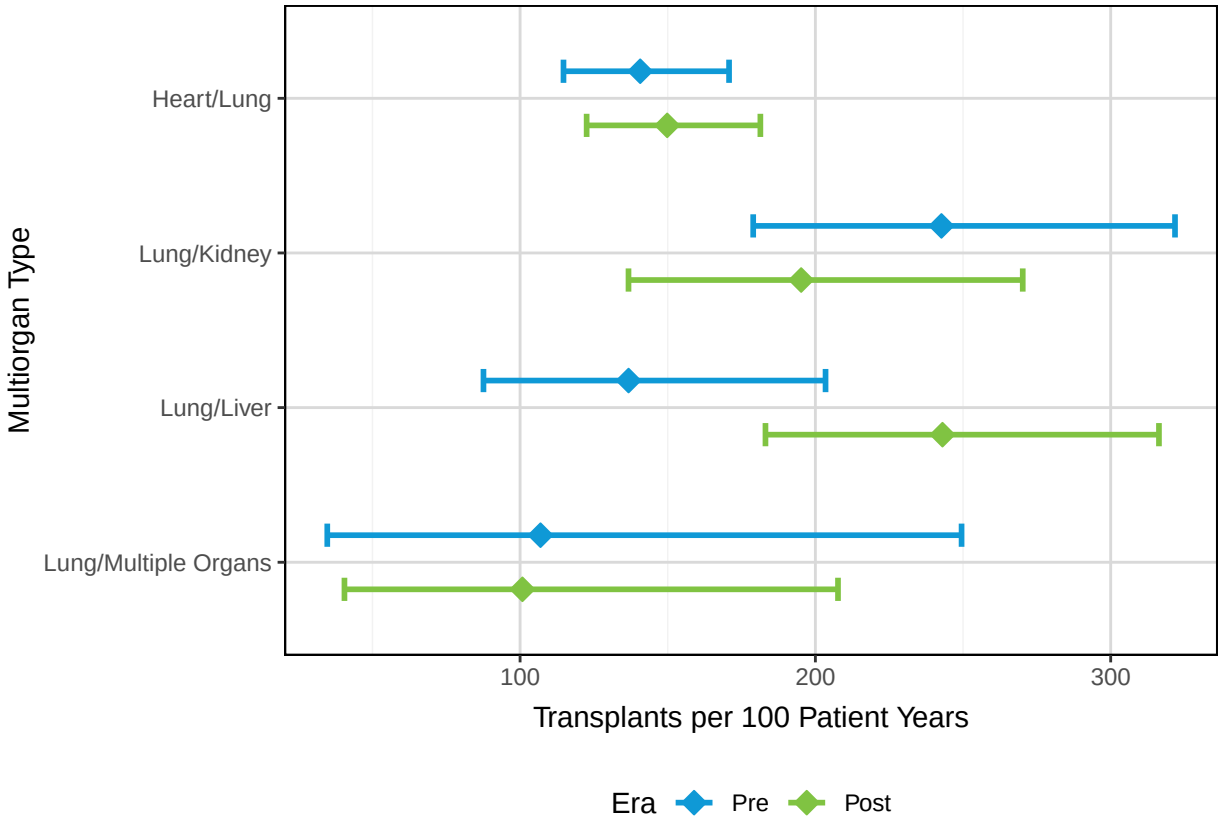
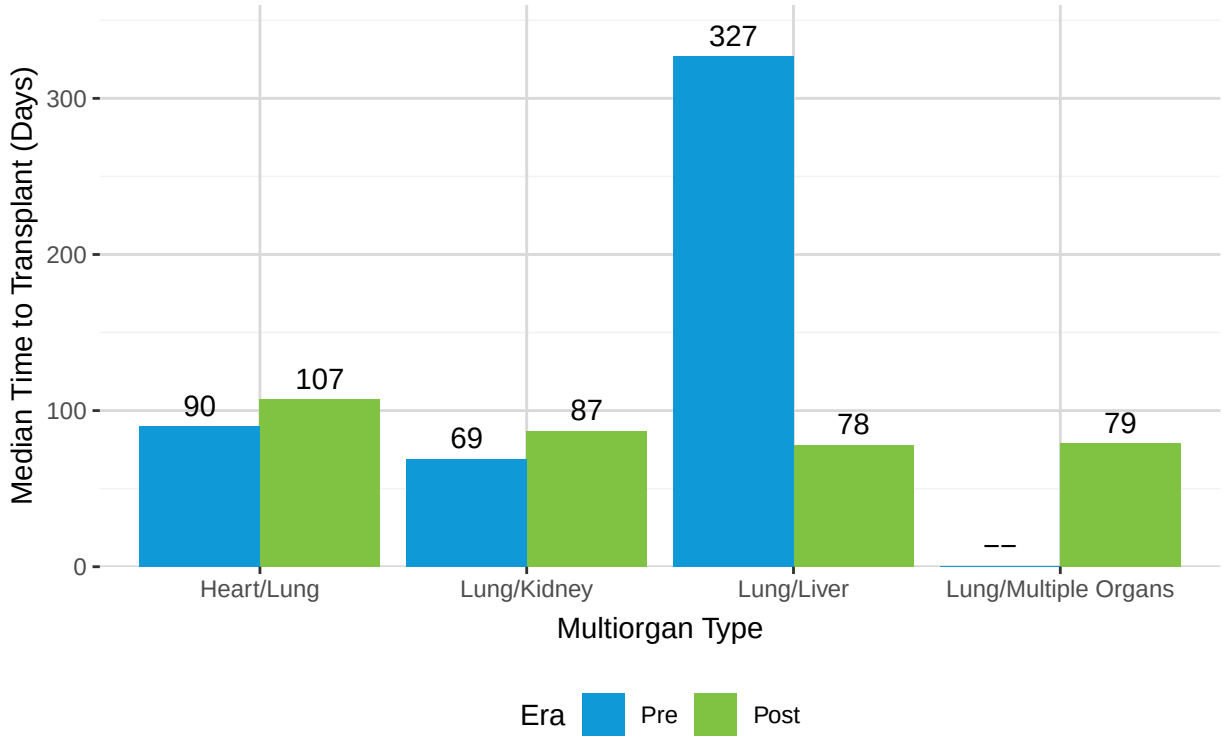


Table 58: Lung-Multiorgan Transplants per 100 Patient Years on the Waiting List by Era and Multiorgan Type

Multiorgan Type	Era	N Patients	Transplants per 100 Patient Years	95% Confidence Interval
Heart/Lung	Pre	180	140.68	(114.70, 170.77)
	Post	183	149.82	(122.54, 181.37)
Lung/Kidney	Pre	71	242.69	(178.94, 321.78)
	Post	65	195.19	(136.71, 270.22)
Lung/Liver	Pre	50	136.73	(87.60, 203.44)
	Post	79	243.04	(183.09, 316.35)
Lung/Multiple Organs	Pre	11	106.91	(34.71, 249.50)
	Post	14	100.79	(40.52, 207.66)

Median time to transplant decreased in the post-policy era for lung/liver candidates and increased slightly for heart/lung and lung/kidney candidates, though sample sizes were small. Median time to transplant was not provided for lung/multiple organ candidates in the pre era because there were less than 10 registrations added to the waiting list during this time period.

Figure 61: Median Time to Transplant (Days) by Era and Multiorgan Type



We were unable to calculate the median time to transplant for patients waiting for a lung and two or more other organs in the pre era because there were less than 10 registrations added to the waiting list during this time period.

Table 59: Median Time to Transplant (Days) by Era and Multiorgan Type

Multiorgan Type	Era	N Registrations	Median Time to Transplant (Days)
Heart/Lung	Pre	141	90
	Post	160	107
Lung/Kidney	Pre	68	69
	Post	54	87
Lung/Liver	Pre	39	327
	Post	71	78
Lung/Multiple Organs	Pre	9	–
	Post	11	79

[a] We were unable to calculate the median time to transplant for patients waiting for a lung and two or more other organs in the pre era because there were less than 10 registrations added to the waiting list during this time period.

Compared to the pre era, median distance increased for all multiorgan types in the post era.

Figure 62: Distribution of Distance (in Nautical Miles) from Donor Hospital to Transplant Program by Era and Multiorgan Type

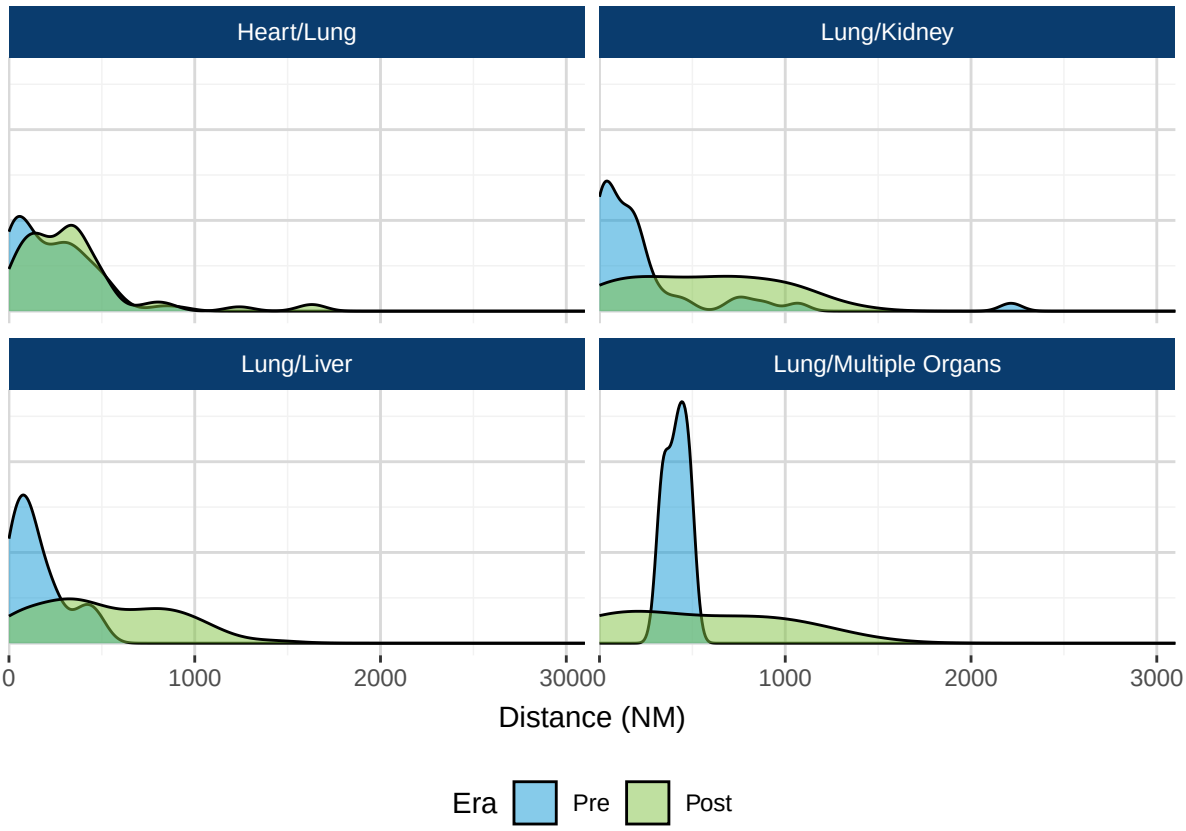
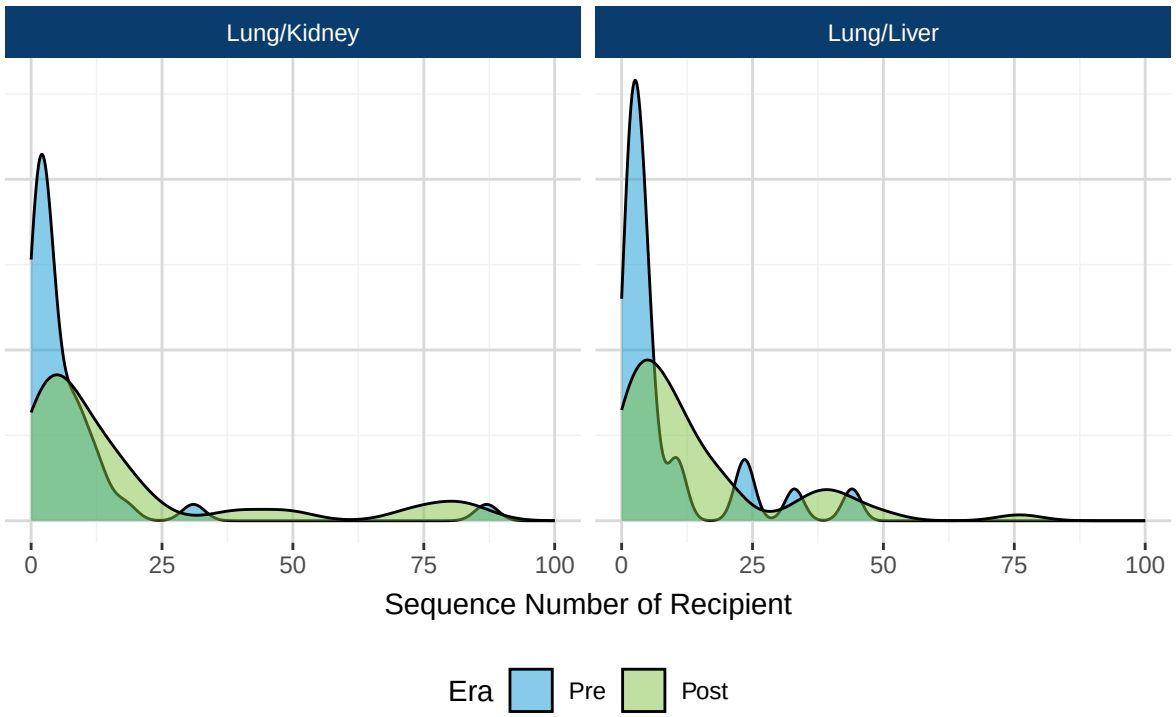


Table 60: Distribution of Distance (in Nautical Miles) from Donor Hospital to Transplant Program by Era and Multiorgan Type

Multiorgan Type	Era	N	N Missing	Min	25th Percentile	Median	Mean	75th Percentile	Max
Heart/Lung	Pre	105	0	0	59.00	211.0	235.48	373.00	936
	Post	111	0	0	129.00	298.0	335.68	395.50	1648
Lung/Kidney	Pre	39	0	0	28.50	126.0	252.72	211.00	2215
	Post	31	0	0	238.00	504.0	556.42	843.50	1341
Lung/Liver	Pre	24	0	3	46.50	112.0	155.92	229.75	473
	Post	54	0	0	234.25	450.0	513.26	806.25	1419
Lung/Multiple Organs	Pre	3	0	343	381.00	419.0	413.33	448.50	478
	Post	4	0	105	136.50	433.5	507.75	804.75	1059
Total	Pre	171	0	0	50.00	158.0	231.36	352.50	2215
	Post	200	0	0	154.00	345.0	421.29	583.75	1648

The median sequence number increased for both lung/kidney and lung/liver recipients. Heart/lungs are more often allocated according to the heart match run and were therefore excluded from this analysis. Lung/multiple organ transplants were also excluded from this analysis due to small sample sizes and because most lung/multiple organ transplants included the heart and were therefore likely placed by the heart match run.

Figure 63: Distribution of the Sequence Number of Lung-Multiorgan Recipients on the Lung Match Run by Era and Multiorgan Type



View is restricted to sequence number 100. There were two instances where the sequence number for a lung/kidney recipient in the post era was greater than 100. One lung/kidney transplant was not included in this analysis because the recipient did not have a recorded acceptance on the lung match.

Table 61: Distribution of the Sequence Number of Lung-Multiorgan Recipients on the Lung Match Run by Era and Multiorgan Type

Multiorgan Type	Era	N	N Missing	Min	25th Percentile	Median	Mean	75th Percentile	Max
Lung/Kidney	Pre	39	1	1	1.25	3	7.50	8.0	87
	Post	31	0	1	3.50	10	43.52	20.0	550
Lung/Liver	Pre	24	0	1	2.00	4	8.17	7.0	44
	Post	54	0	1	3.25	9	13.85	17.5	76

[a] One lung/kidney transplant was not included in this analysis because the recipient did not have a recorded acceptance on the lung match.

Appendix

Patient Characteristics

The sections above describe how continuous distribution performed within the attributes incorporated into the lung CAS. However, equity across various patient demographics is also of concern to the OPTN Lung Transplantation Committee and broader lung transplantation community. The following section examines continuous distribution's impact across patient age groups, diagnosis groups, birth sex, race/ethnicity groups, and OPTN regions.

Deaths or removals for too sick per 100 patient years on the waiting list did not significantly increase for any age group, diagnosis group, birth sex, race/ethnicity, or OPTN region (**Figure 64, Table 62**). Likewise, the number of transplants per 100 patient years on the waiting list did not significantly decrease for any age group, diagnosis group, birth sex, race/ethnicity, or OPTN region (**Figure 65, Table 63**). Distance from the donor hospital to transplant program increased across all age groups, diagnosis groups, birth sex, race/ethnicity groups, and OPTN regions (**Figure 66, Table 64**). Median time to transplant decreased for all diagnosis groups, birth sex, race/ethnicity groups, and for most age groups and OPTN regions (**Figure 67, Table 65**). However, the 65+ age group and OPTN regions 6, 8, and 10 all saw slight increases in the median time to transplant in the post era. There were no statistically significant changes in one-year post-transplant survival across any age groups, diagnosis groups, birth sex, race/ethnicity groups, or OPTN regions (**Figure 68, Table 66**).

Note: In all figures and tables, NH stands for "Non-Hispanic".

Figure 64: Deaths or Removals for Too Sick per 100 Patient Years on the Waiting List by Era and Patient Characteristic

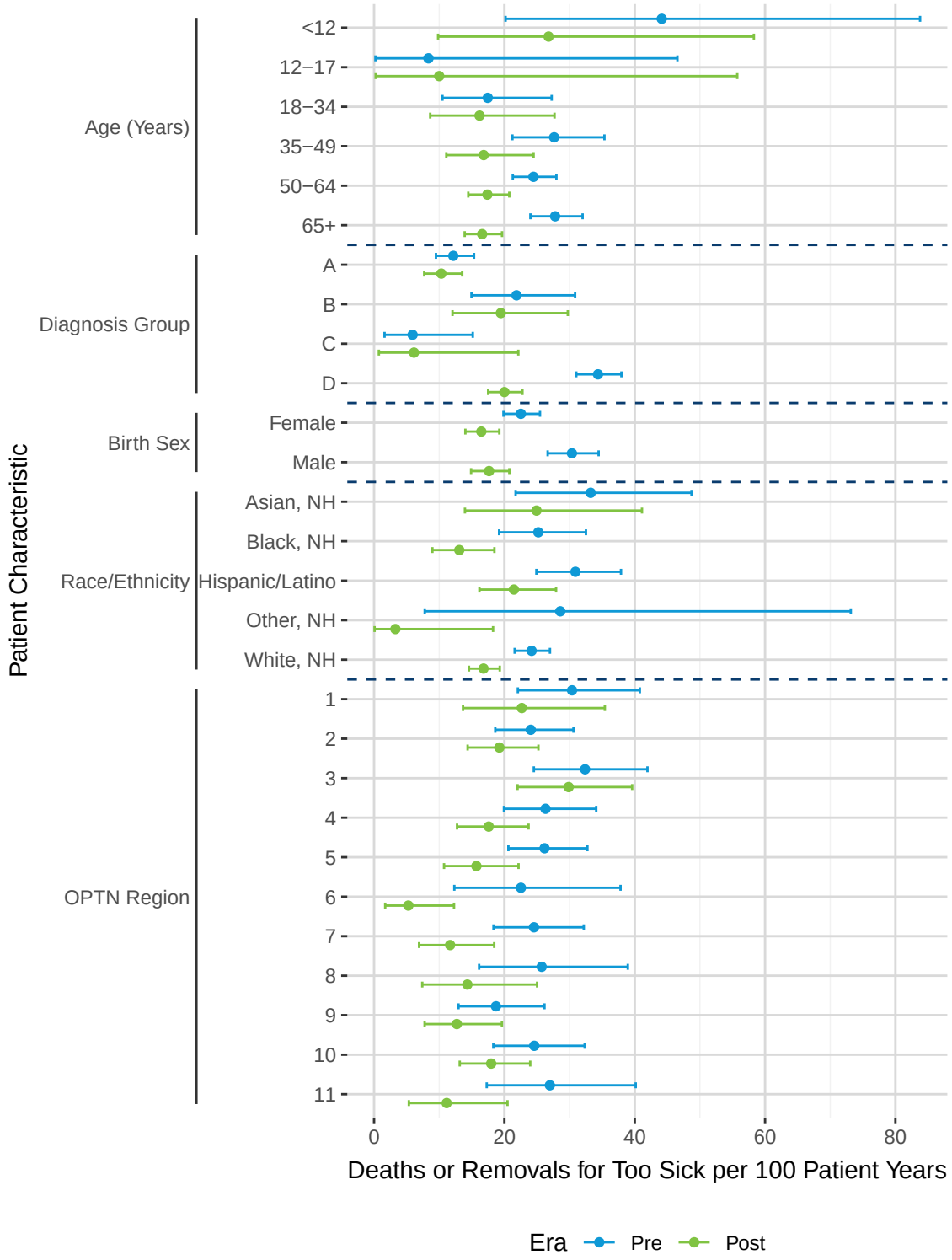


Table 62: Deaths or Removals for Too Sick per 100 Patient Years on the Waiting List by Era and Patient Characteristic

Patient Characteristic	Level	Era	Deaths or Removals for Too Sick Per 100 Patient Years	95% Confidence Interval
Age (Years)	<12	Pre	44.14	(20.18, 83.78)
		Post	26.78	(9.83, 58.28)
	12-17	Pre	8.35	(0.21, 46.55)
		Post	10.00	(0.25, 55.73)
	18-34	Pre	17.45	(10.50, 27.25)
		Post	16.19	(8.62, 27.69)
	35-49	Pre	27.63	(21.23, 35.35)
		Post	16.82	(11.09, 24.48)
	50-64	Pre	24.46	(21.29, 27.98)
		Post	17.39	(14.46, 20.75)
	65+	Pre	27.78	(23.99, 32.00)
		Post	16.59	(13.91, 19.64)
Diagnosis Group	A	Pre	12.16	(9.50, 15.34)
		Post	10.32	(7.70, 13.53)
	B	Pre	21.86	(14.95, 30.85)
		Post	19.45	(12.04, 29.73)
	C	Pre	5.92	(1.61, 15.15)
		Post	6.13	(0.74, 22.14)
	D	Pre	34.36	(31.03, 37.95)
		Post	20.01	(17.51, 22.77)
Birth Sex	Female	Pre	22.53	(19.86, 25.46)
		Post	16.46	(14.01, 19.22)
	Male	Pre	30.36	(26.64, 34.46)
		Post	17.65	(14.89, 20.76)
Race/Ethnicity	Asian, NH	Pre	33.24	(21.72, 48.71)
		Post	24.93	(13.95, 41.11)
	Black, NH	Pre	25.20	(19.19, 32.51)
		Post	13.08	(8.95, 18.47)
	Hispanic/Latino	Pre	30.90	(24.91, 37.89)
		Post	21.46	(16.17, 27.93)
	Other, NH	Pre	28.57	(7.78, 73.15)
		Post	3.28	(0.08, 18.26)
	White, NH	Pre	24.18	(21.58, 26.99)
		Post	16.80	(14.56, 19.29)
		Pre	30.38	(22.07, 40.78)

(continued)

Patient Characteristic	Level	Era	Deaths or Removals for Too Sick Per 100 Patient Years	95% Confidence Interval
OPTN Region	1	Post	22.67	(13.65, 35.41)
	2	Pre	24.05	(18.60, 30.60)
		Post	19.23	(14.36, 25.22)
	3	Pre	32.38	(24.52, 41.95)
		Post	29.86	(22.02, 39.60)
	4	Pre	26.31	(19.93, 34.09)
		Post	17.60	(12.74, 23.71)
	5	Pre	26.16	(20.61, 32.74)
		Post	15.71	(10.74, 22.17)
	6	Pre	22.54	(12.32, 37.82)
		Post	5.26	(1.71, 12.27)
	7	Pre	24.54	(18.33, 32.18)
		Post	11.67	(6.91, 18.44)
	8	Pre	25.72	(16.12, 38.94)
		Post	14.32	(7.40, 25.02)
	9	Pre	18.71	(12.96, 26.15)
		Post	12.70	(7.76, 19.62)
	10	Pre	24.58	(18.30, 32.32)
		Post	17.97	(13.15, 23.96)
	11	Pre	26.98	(17.29, 40.15)
		Post	11.14	(5.34, 20.48)

Figure 65: Lung Transplants per 100 Patient Years on the Waiting List by Era and Patient Characteristic

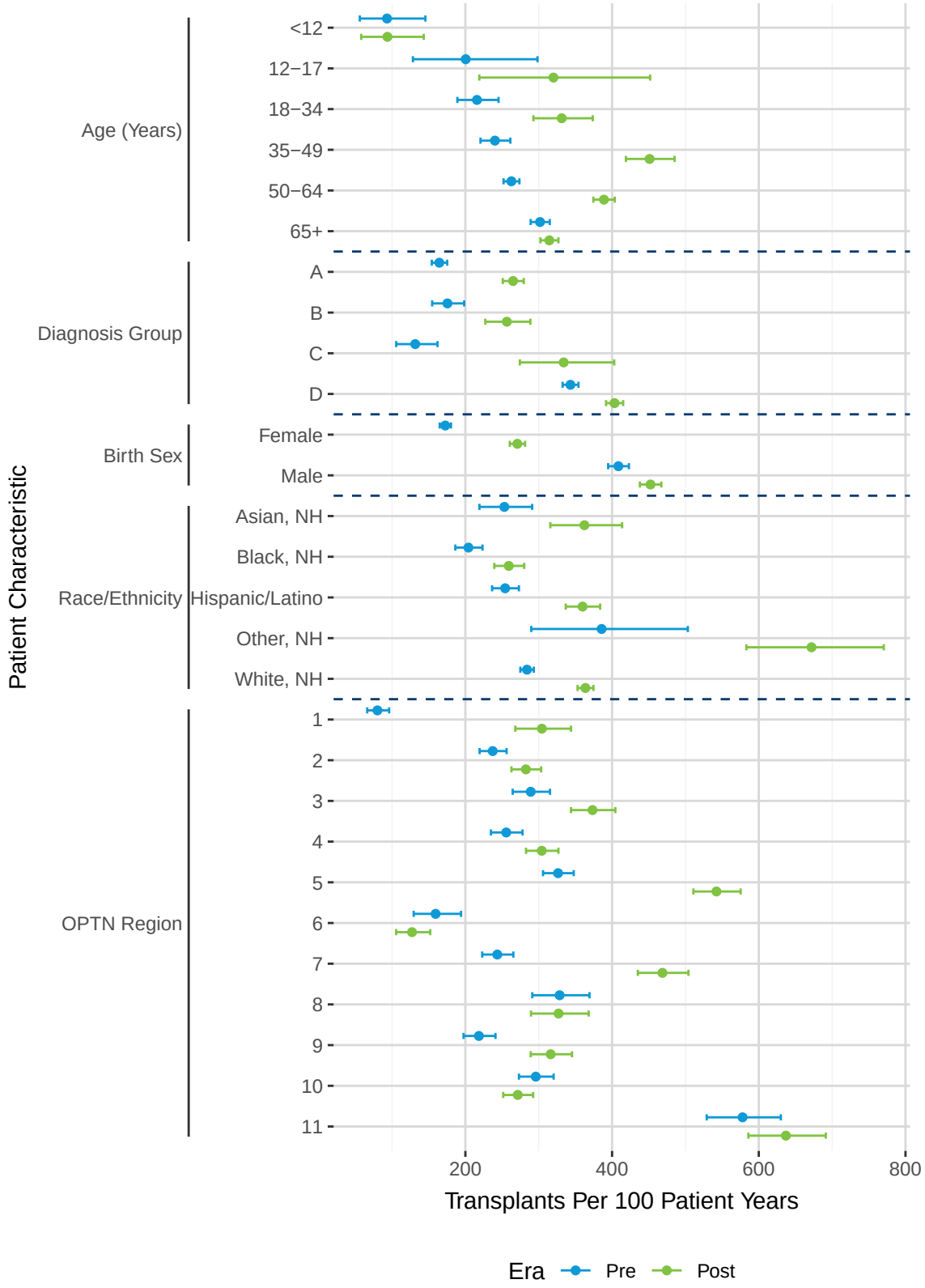


Table 63: Lung Transplants per 100 Patient Years on the Waiting List by Era and Patient Characteristic

Patient Characteristic	Level	Era	Transplants Per 100 Patient Years	95% Confidence Interval
Age (Years)	<12	Pre	93.17	(56.10, 145.50)
		Post	93.72	(58.01, 143.25)
	12-17	Pre	200.50	(128.47, 298.33)
		Post	320.09	(218.94, 451.87)
	18-34	Pre	215.79	(189.08, 245.22)
		Post	331.35	(292.73, 373.66)
	35-49	Pre	240.32	(220.61, 261.31)
		Post	451.12	(418.85, 485.21)
	50-64	Pre	262.68	(252.02, 273.67)
		Post	388.89	(374.49, 403.70)
	65+	Pre	301.80	(288.99, 315.04)
		Post	314.40	(302.33, 326.83)
Diagnosis Group	A	Pre	164.47	(154.23, 175.22)
		Post	265.02	(251.00, 279.63)
	B	Pre	175.53	(154.72, 198.35)
		Post	256.55	(227.22, 288.61)
	C	Pre	131.64	(105.72, 162.00)
		Post	333.99	(274.24, 402.89)
	D	Pre	343.25	(332.56, 354.20)
		Post	403.31	(391.78, 415.09)
Birth Sex	Female	Pre	172.62	(165.08, 180.42)
		Post	270.84	(260.59, 281.39)
	Male	Pre	408.61	(394.64, 422.95)
		Post	452.36	(437.94, 467.14)
Race/Ethnicity	Asian, NH	Pre	253.16	(219.13, 290.99)
		Post	362.27	(315.78, 413.69)
	Black, NH	Pre	204.19	(186.30, 223.35)
		Post	259.19	(239.40, 280.17)
	Hispanic/Latino	Pre	254.23	(236.44, 273.01)
		Post	359.73	(336.88, 383.72)
	Other, NH	Pre	385.71	(289.76, 503.27)
		Post	671.86	(583.03, 770.40)
	White, NH	Pre	284.00	(274.93, 293.28)
		Post	363.65	(352.95, 374.59)
	1	Pre	80.08	(66.18, 96.05)
		Post	304.30	(268.09, 344.03)

(continued)

Patient Characteristic	Level	Era	Transplants Per 100 Patient Years	95% Confidence Interval
OPTN Region	2	Pre	237.25	(219.38, 256.20)
		Post	282.52	(262.84, 303.29)
	3	Pre	289.11	(264.53, 315.35)
		Post	373.31	(344.03, 404.41)
	4	Pre	255.72	(234.86, 277.92)
		Post	304.15	(282.67, 326.83)
	5	Pre	326.31	(305.87, 347.77)
		Post	542.34	(510.83, 575.29)
	6	Pre	159.42	(129.57, 194.08)
		Post	127.27	(105.61, 152.07)
	7	Pre	243.51	(222.95, 265.46)
		Post	468.65	(435.10, 504.09)
	8	Pre	328.49	(291.20, 369.23)
		Post	327.05	(289.47, 368.16)
	9	Pre	218.46	(197.50, 241.05)
		Post	316.30	(289.13, 345.34)
	10	Pre	295.98	(273.03, 320.35)
		Post	271.43	(251.62, 292.38)
	11	Pre	577.87	(528.98, 630.05)
		Post	636.97	(585.83, 691.38)

Figure 66: Distribution of Distance (in Nautical Miles) from Donor Hospital to Transplant Program by Era and Patient Characteristic

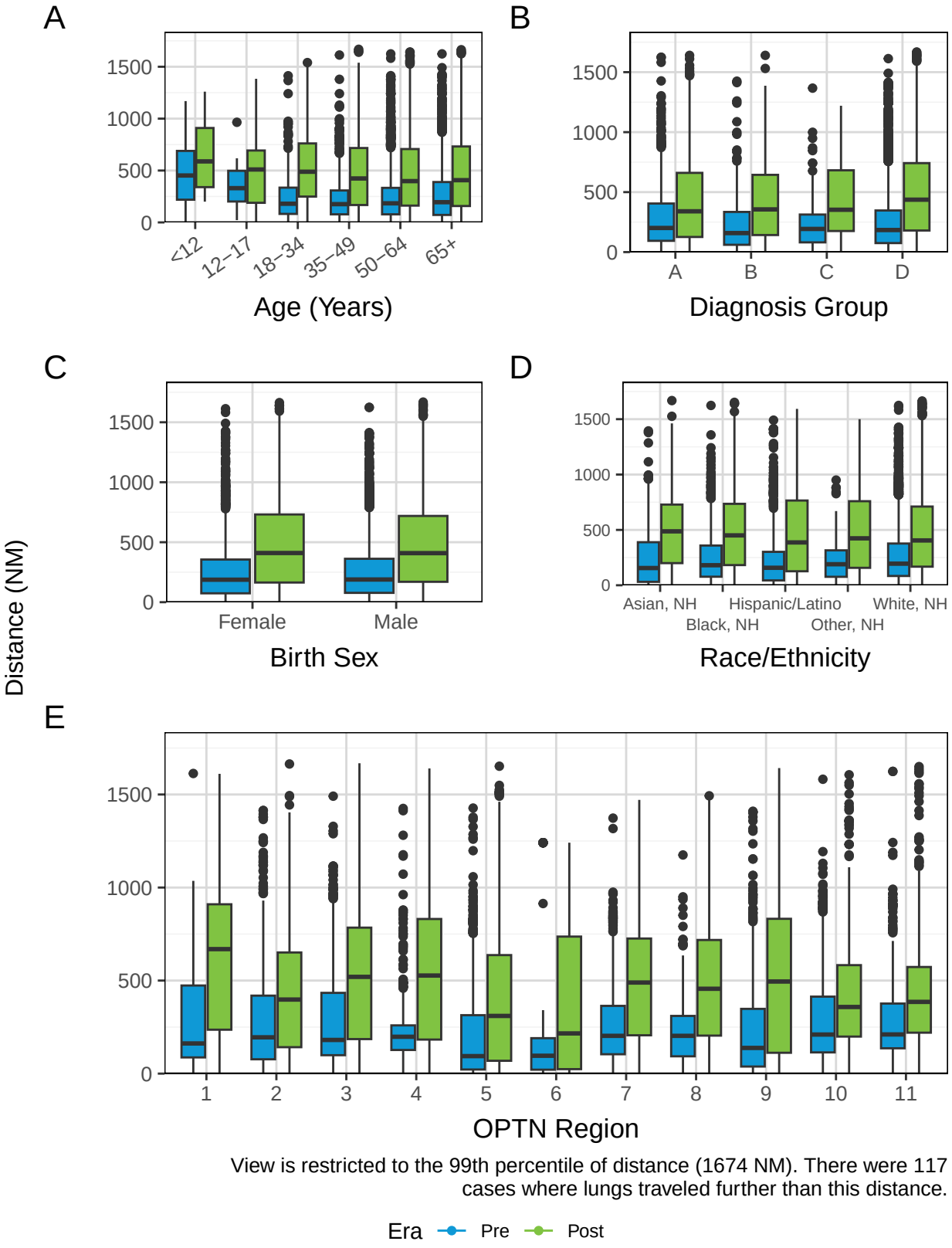


Table 64: Distribution of Distance (in Nautical Miles) from Donor Hospital to Transplant Program by Era and Patient Characteristic

Category	Level	Era	N	Min	25th Percentile	Median	Mean	75th Percentile	Max
Age (Years)	<12	Pre	19	0	219.00	452.0	485.42	689.00	1169
		Post	21	200	340.00	588.0	617.71	910.00	1260
	12-17	Pre	24	22	201.50	330.0	345.25	497.25	965
		Post	33	3	189.00	510.0	486.48	693.00	1384
	18-34	Pre	238	0	82.50	180.0	254.47	337.25	1872
		Post	268	0	255.00	499.0	541.24	772.25	1870
	35-49	Pre	560	0	78.75	177.5	246.25	309.25	2161
		Post	734	0	175.75	427.0	505.31	737.75	2349
	50-64	Pre	2301	0	79.00	184.0	259.92	334.00	2275
		Post	2761	0	165.00	407.0	488.25	721.00	2920
	65+	Pre	2093	0	72.00	196.0	279.18	393.00	2998
		Post	2574	0	162.00	420.0	505.01	761.00	2284
Diagnosis Group	A	Pre	962	0	94.00	201.0	288.95	405.00	1624
		Post	1338	0	128.00	343.0	452.86	682.00	2920
	B	Pre	262	0	60.75	158.5	235.36	334.75	1425
		Post	281	0	143.00	360.0	438.10	644.00	2349
	C	Pre	90	0	81.25	194.0	267.56	319.00	1872
		Post	109	0	178.00	362.0	483.42	689.00	2054
	D	Pre	3921	0	75.00	185.0	263.88	354.00	2998
		Post	4663	0	186.50	448.0	517.09	760.00	2261
Birth Sex	Female	Pre	1986	0	74.00	188.5	265.23	359.00	2275
		Post	2648	0	166.00	418.5	503.94	750.00	2349
	Male	Pre	3249	0	78.00	190.0	268.28	364.00	2998
		Post	3743	0	176.50	419.0	496.53	732.50	2920
Race/Ethnicity	Asian, NH	Pre	201	0	31.00	156.0	265.46	395.00	2069
		Post	218	0	203.25	490.5	528.66	756.00	2058
	Black, NH	Pre	482	0	77.25	181.0	264.94	358.75	1624
		Post	637	0	183.00	458.0	509.86	737.00	2060
	Hispanic/Latino	Pre	763	0	44.00	158.0	241.42	304.00	2275
		Post	931	0	136.00	400.0	505.34	792.50	2205
	Other, NH	Pre	55	0	76.50	190.0	256.35	315.50	950
		Post	206	0	172.00	455.0	563.51	794.75	2220
	White, NH	Pre	3734	0	84.00	196.0	272.90	379.00	2998
		Post	4399	0	174.50	411.0	492.46	726.00	2920
		Pre	116	0	87.00	162.0	310.55	473.50	1613

(continued)

Category	Level	Era	N	Min	25th Percentile	Median	Mean	75th Percentile	Max
OPTN Region	1	Post	256	0	303.00	695.0	729.28	972.75	2920
	2	Pre	655	0	77.00	195.0	295.10	419.00	1414
		Post	772	0	142.75	400.5	452.23	664.50	2116
	3	Pre	513	0	99.00	183.0	318.91	436.00	2072
		Post	600	0	207.50	547.5	572.76	803.00	2221
	4	Pre	560	0	127.00	198.0	225.43	259.25	1425
		Post	748	0	183.00	532.0	548.10	833.25	1822
	5	Pre	951	0	22.00	94.0	221.40	315.00	2275
		Post	1113	0	77.00	316.0	453.19	689.00	2261
	6	Pre	99	1	21.00	96.0	213.62	190.50	1241
		Post	121	3	24.00	216.0	402.61	750.00	2349
	7	Pre	527	0	104.00	203.0	263.05	364.00	1373
		Post	730	0	206.00	489.5	502.21	726.00	1471
	8	Pre	281	0	93.00	203.0	228.42	310.00	1175
		Post	274	0	204.25	456.0	496.22	718.25	1493
	9	Pre	401	0	38.00	142.0	273.24	389.00	2225
		Post	502	0	112.75	505.5	533.58	858.00	2107
	10	Pre	611	0	115.00	210.0	303.44	417.50	1777
		Post	698	0	204.00	367.0	448.64	599.00	1866
	11	Pre	521	0	136.00	212.0	287.43	378.00	2998
		Post	577	0	221.00	391.0	462.36	588.00	2054

Figure 67: Median Time to Transplant (Days) by Era and Patient Characteristic

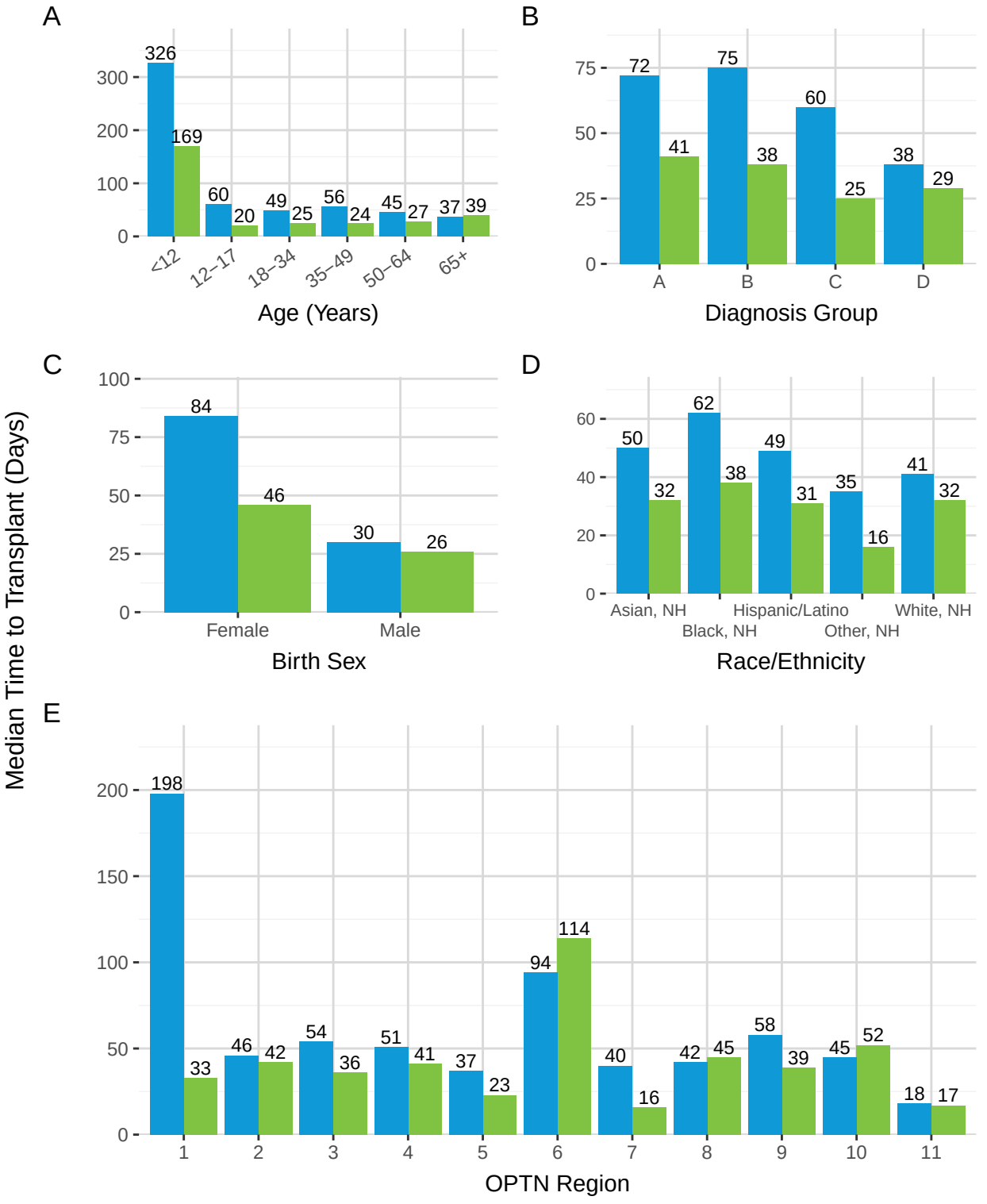


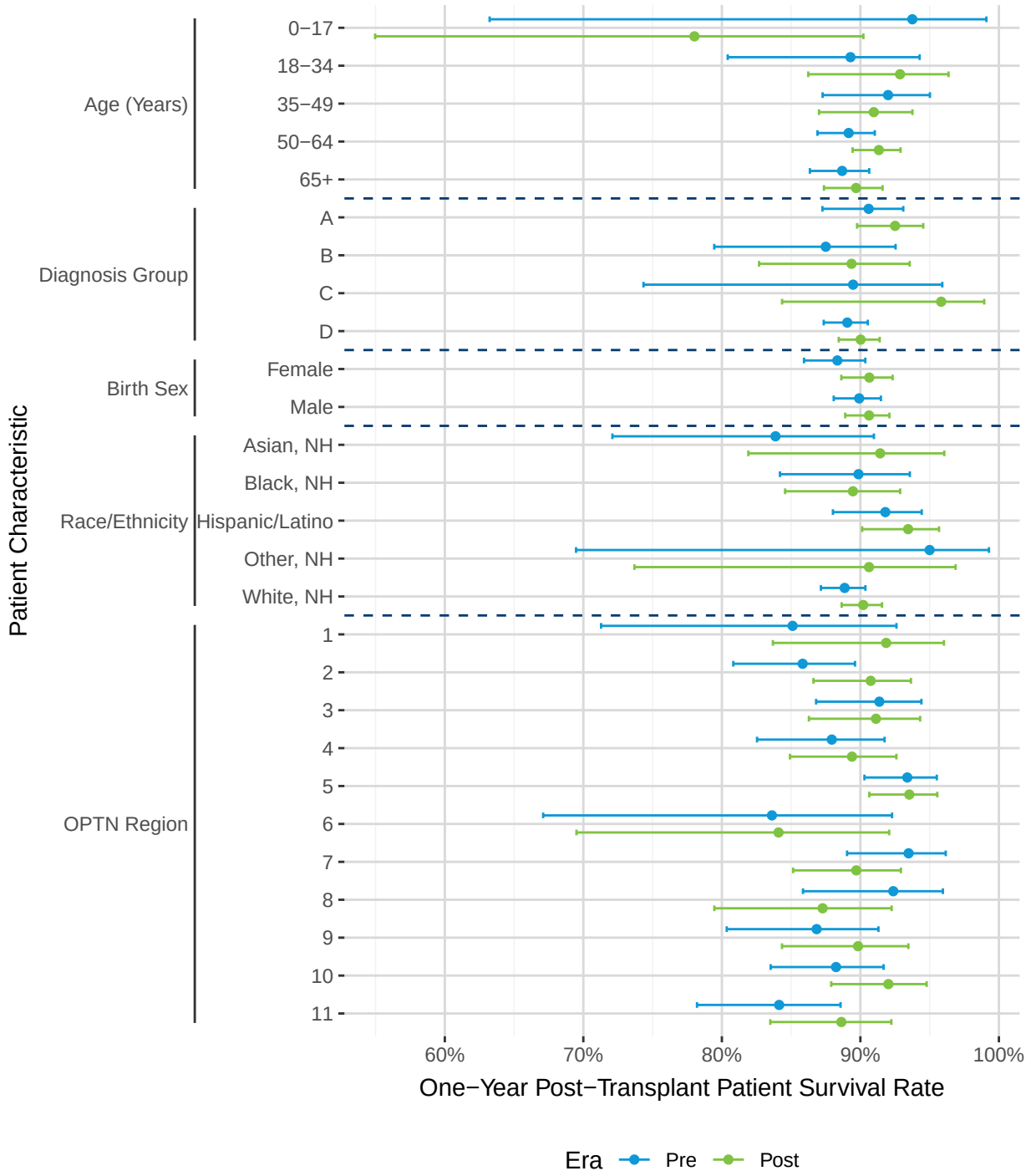
Table 65: Median Time to Transplant (Days) by Era and Patient Characteristic

Category	Level	Era	N Additions	Median Time to Transplant (Days)
Age (Years)	<12	Pre	38	326
		Post	30	169
	12-17	Pre	34	60
		Post	32	20
	18-34	Pre	296	49
		Post	283	25
	35-49	Pre	691	56
		Post	733	24
	50-64	Pre	2677	45
		Post	2954	27
	65+	Pre	2268	37
		Post	2861	39
Diagnosis Group	A	Pre	1091	72
		Post	1456	41
	B	Pre	310	75
		Post	292	38
	C	Pre	106	60
		Post	98	25
	D	Pre	4497	38
		Post	5047	29
Birth Sex	Female	Pre	2406	84
		Post	2830	46
	Male	Pre	3598	30
		Post	4063	26
Race/Ethnicity	Asian, NH	Pre	250	50
		Post	232	32
	Black, NH	Pre	582	62
		Post	700	38
	Hispanic/Latino	Pre	879	49
		Post	1017	31
	Other, NH	Pre	56	35
		Post	232	16
	White, NH	Pre	4237	41
		Post	4712	32
	1	Pre	186	198
		Post	255	33

(continued)

Category	Level	Era	N Additions	Median Time to Transplant (Days)
OPTN Region	2	Pre	743	46
		Post	860	42
	3	Pre	615	54
		Post	656	36
	4	Pre	679	51
		Post	834	41
	5	Pre	1036	37
		Post	1156	23
	6	Pre	130	94
		Post	141	114
	7	Pre	593	40
		Post	734	16
	8	Pre	310	42
		Post	305	45
	9	Pre	440	58
		Post	547	39
	10	Pre	721	45
		Post	808	52
	11	Pre	551	18
		Post	597	17

Figure 68: One-Year Post-Transplant Patient Survival by Era and Patient Characteristic



In this analysis, the pre−policy era includes transplant recipients from June 09, 2022 to March 08, 2023 and the post−policy era includes transplant recipients from March 09, 2023 to December 08, 2023.

Table 66: One-Year Post-Transplant Patient Survival by Era and Patient Characteristic

Category	Level	Era	N Patients	N Deaths	1-Year Survival	95% Confidence Interval
Age (Years)	0-17	Pre	16	1	93.8%	(63.2%, 99.1%)
		Post	23	5	78.0%	(55.0%, 90.2%)
	18-34	Pre	84	9	89.3%	(80.4%, 94.3%)
		Post	114	8	92.9%	(86.2%, 96.4%)
	35-49	Pre	201	16	92.0%	(87.3%, 95.0%)
		Post	288	26	91.0%	(87.0%, 93.8%)
	50-64	Pre	878	95	89.2%	(86.9%, 91.0%)
		Post	1033	89	91.3%	(89.4%, 92.9%)
	65+	Pre	853	96	88.7%	(86.4%, 90.6%)
		Post	815	83	89.7%	(87.4%, 91.6%)
Diagnosis Group	A	Pre	395	37	90.6%	(87.3%, 93.1%)
		Post	488	36	92.5%	(89.8%, 94.5%)
	B	Pre	104	13	87.5%	(79.4%, 92.5%)
		Post	134	14	89.4%	(82.7%, 93.6%)
	C	Pre	38	4	89.5%	(74.3%, 95.9%)
		Post	48	2	95.8%	(84.4%, 98.9%)
	D	Pre	1495	163	89.1%	(87.4%, 90.5%)
		Post	1603	159	90.0%	(88.4%, 91.4%)
Birth Sex	Female	Pre	816	95	88.3%	(85.9%, 90.4%)
		Post	973	90	90.6%	(88.6%, 92.3%)
	Male	Pre	1216	122	89.9%	(88.1%, 91.5%)
		Post	1300	121	90.6%	(88.9%, 92.1%)
Race/Ethnicity	Asian, NH	Pre	62	10	83.9%	(72.1%, 91.0%)
		Post	70	6	91.4%	(81.9%, 96.1%)
	Black, NH	Pre	168	17	89.9%	(84.2%, 93.6%)
		Post	220	23	89.5%	(84.6%, 92.9%)
	Hispanic/Latino	Pre	293	24	91.8%	(88.0%, 94.4%)
		Post	321	21	93.4%	(90.1%, 95.7%)
	Other, NH	Pre	20	1	95.0%	(69.5%, 99.3%)
		Post	32	3	90.6%	(73.7%, 96.9%)
	White, NH	Pre	1489	165	88.9%	(87.2%, 90.4%)
		Post	1630	158	90.2%	(88.6%, 91.6%)
	1	Pre	47	7	85.1%	(71.3%, 92.6%)
		Post	86	7	91.9%	(83.7%, 96.0%)
	2	Pre	247	35	85.8%	(80.8%, 89.6%)
		Post	271	25	90.7%	(86.6%, 93.7%)

(continued)

Category	Level	Era	N Patients	N Deaths	1-Year Survival	95% Confidence Interval
OPTN Region	3	Pre	221	19	91.4%	(86.8%, 94.4%)
		Post	203	18	91.1%	(86.3%, 94.3%)
	4	Pre	200	24	87.9%	(82.5%, 91.7%)
		Post	255	27	89.4%	(84.9%, 92.6%)
	5	Pre	364	24	93.4%	(90.3%, 95.5%)
		Post	410	26	93.5%	(90.6%, 95.6%)
	6	Pre	37	6	83.6%	(67.1%, 92.3%)
		Post	44	7	84.1%	(69.5%, 92.1%)
	7	Pre	201	13	93.5%	(89.0%, 96.2%)
		Post	244	25	89.7%	(85.1%, 92.9%)
	8	Pre	118	9	92.4%	(85.9%, 96.0%)
		Post	110	14	87.3%	(79.5%, 92.3%)
	9	Pre	152	20	86.8%	(80.4%, 91.3%)
		Post	178	18	89.8%	(84.3%, 93.5%)
	10	Pre	247	29	88.2%	(83.5%, 91.7%)
		Post	256	20	92.0%	(87.9%, 94.8%)
	11	Pre	198	31	84.1%	(78.2%, 88.6%)
		Post	216	24	88.6%	(83.5%, 92.2%)

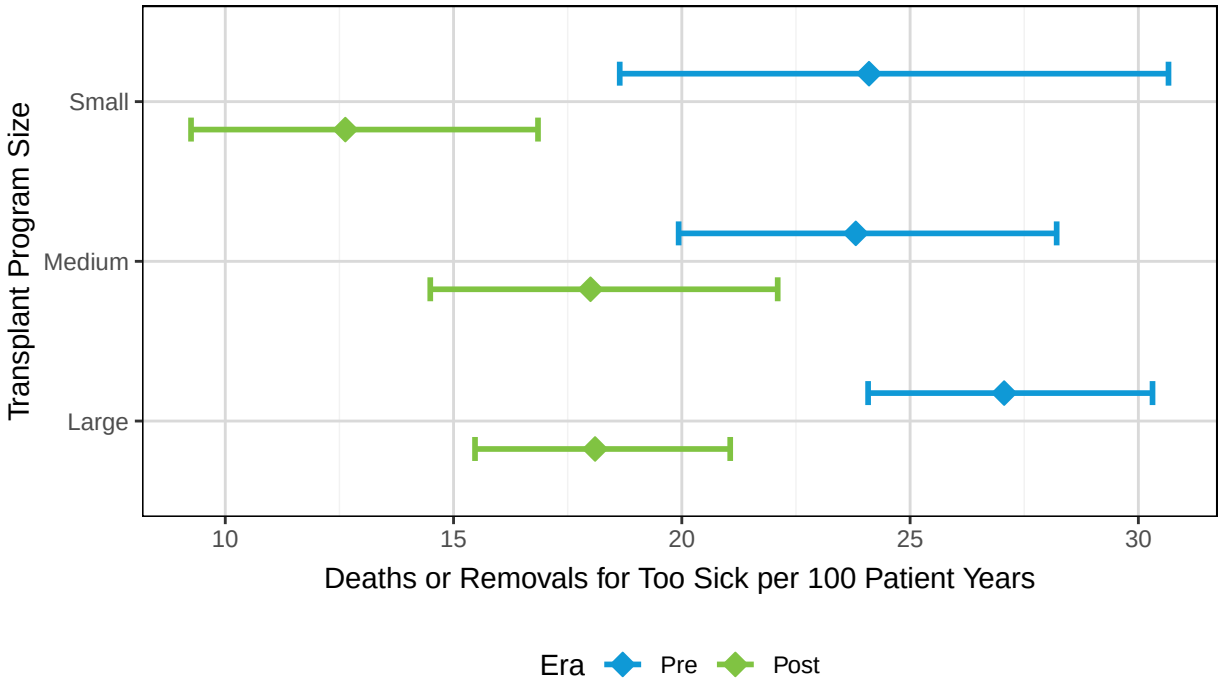
[a] In this analysis, the pre-policy era includes transplant recipients from June 09, 2022 to March 08, 2023 and the post-policy era includes transplant recipients from March 09, 2023 to December 08, 2023.

Transplant Program Geography & Size

This section examines the impact of transplant program size and location on the number of candidates transplanted or removed from the waiting list for death or too sick per 100 patient years waiting. In all figures, program size is determined by the number of candidates ever waiting at a program in the pre-policy era.

The number of waiting list removals for death or too sick per 100 patient years on the waiting list decreased across all program size groups. However, the decrease was only statistically significant for small and large programs.

Figure 69: Deaths or Removals for Too Sick per 100 Patient Years on the Waiting List by Era and Transplant Program Size



Transplant program size is based on the number of lung candidates ever waiting at a program in the pre era. Small programs had 62 or fewer candidates, medium programs had 63−126 candidates, and large programs had 127+ candidates. Cutpoints were chosen based on the tertiles in the distribution of candidates ever waiting at each program in the pre era.

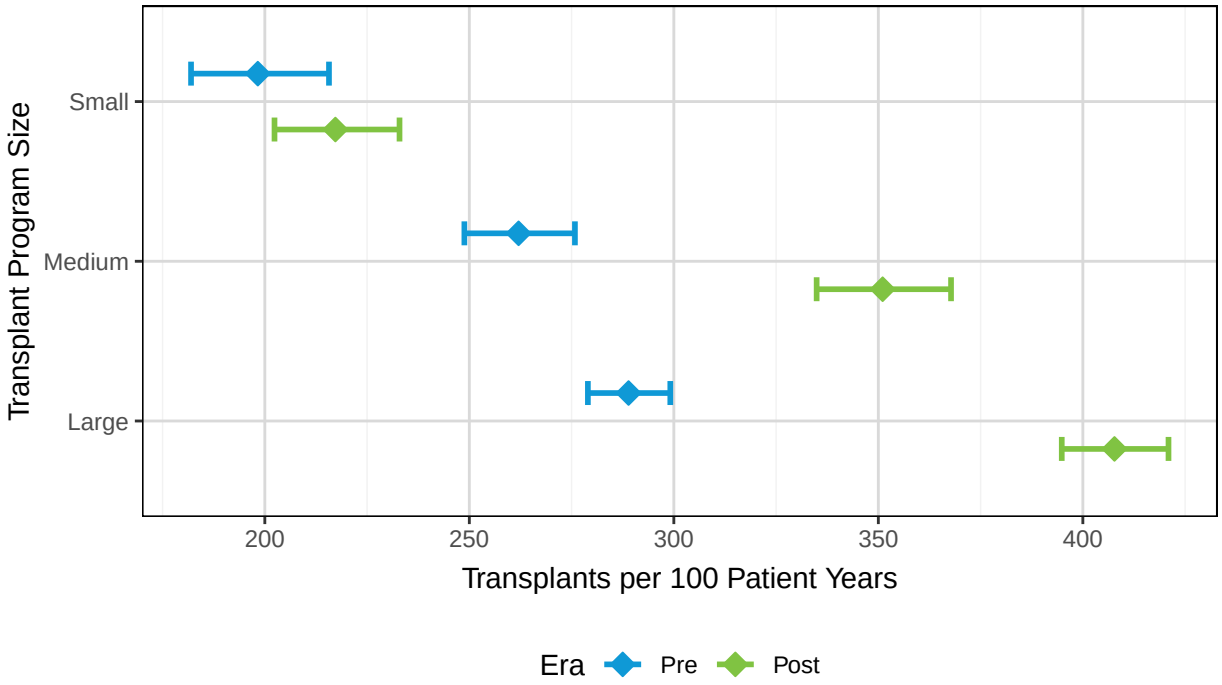
Table 67: Deaths or Removals for Too Sick per 100 Patient Years on the Waiting List by Era and Transplant Program Size

Transplant Program Size	Era	N Patients	Deaths or Removals for Too Sick per 100 Patient Years	95% Confidence Interval
Small	Pre	840	24.10	(18.64, 30.66)
	Post	1075	12.63	(9.25, 16.85)
Medium	Pre	1944	23.81	(19.93, 28.21)
	Post	2195	18.00	(14.49, 22.10)
Large	Pre	4096	27.06	(24.08, 30.31)
	Post	4465	18.10	(15.47, 21.06)

[a] Transplant program size is based on the number of lung candidates ever waiting at a program in the pre era. Small programs had 62 or fewer candidates, medium programs had 63-126 candidates, and large programs had 127+ candidates. Cutpoints were chosen based on the tertiles in the distribution of candidates ever waiting at each program in the pre era.

The number of transplants per 100 patient years on the waiting list increased across all program sizes. This increase was statistically significant in medium and large programs but was not statistically significant in small programs.

Figure 70: Transplants per 100 Patient Years on the Waiting List by Era and Transplant Program Size



Transplant program size is based on the number of lung candidates ever waiting at a program in the pre era. Small programs had 62 or fewer candidates, medium programs had 63−126 candidates, and large programs had 127+ candidates. Cutpoints were chosen based on the tertiles in the distribution of candidates ever waiting at each program in the pre era.

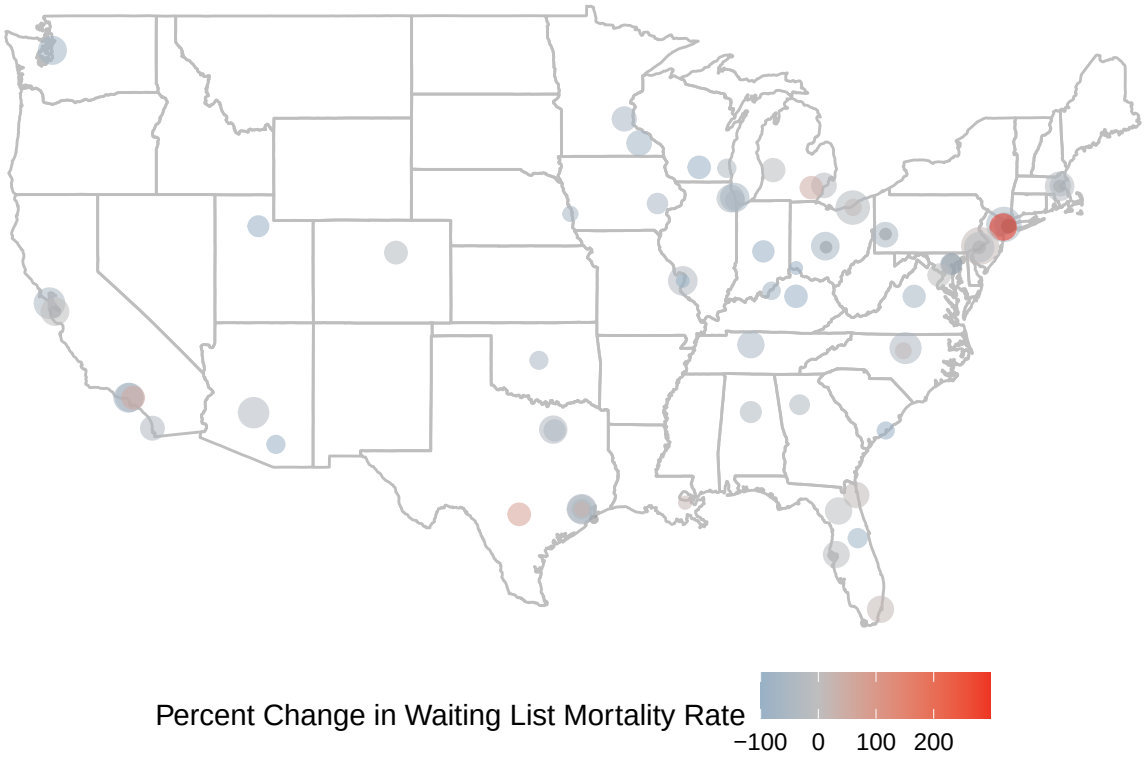
Table 68: Transplants per 100 Patient Years on the Waiting List by Era and Transplant Program Size

Transplant Program Size	Era	N Patients	Transplants per 100 Patient Years	95% Confidence Interval
Small	Pre	840	198.29	(181.96, 215.69)
	Post	1075	217.25	(202.37, 232.93)
Medium	Pre	1944	262.04	(248.79, 275.82)
	Post	2195	351.05	(334.91, 367.77)
Large	Pre	4096	288.93	(278.99, 299.13)
	Post	4465	407.73	(394.84, 420.94)

[a] Transplant program size is based on the number of lung candidates ever waiting at a program in the pre era. Small programs had 62 or fewer candidates, medium programs had 63-126 candidates, and large programs had 127+ candidates. Cutpoints were chosen based on the tertiles in the distribution of candidates ever waiting at each program in the pre era.

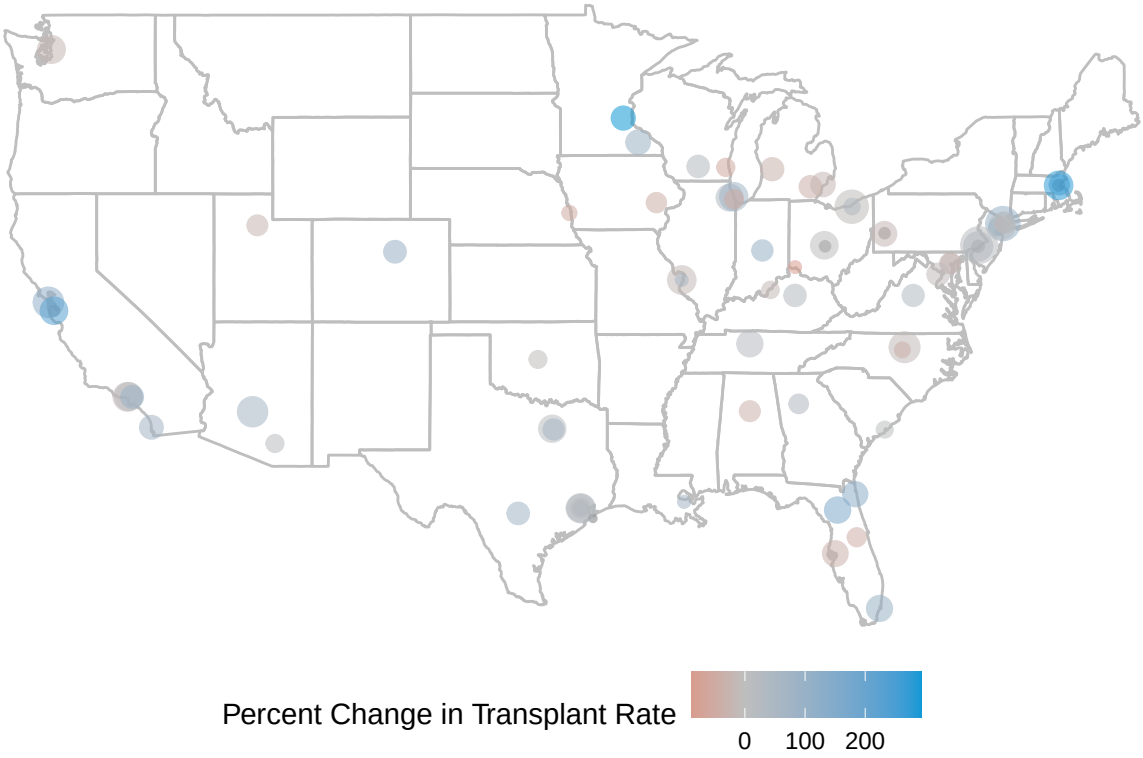
This figure displays each program's percent change in the number of candidates removed from the waiting list for death or too sick to transplant per 100 patient years (i.e., waiting list mortality rate) from the pre-policy era to the post-policy era. Each point represents an active lung transplant program and the size of the point represents the relative number of lung candidates listed at each program during the pre-policy era. Overall, there were no noticeable trends in the change in waiting list mortality rates from the pre era to the post era based on program size or geography.

Figure 71: Percent Change in the Number of Deaths or Removals for Too Sick per 100 Patient Years from the Pre-Policy Era to the Post-Policy Era by Transplant Program Size and Location



This figure displays transplant program's percent change in the number of candidates transplanted per 100 patient years (i.e., transplant rate) from the pre-policy era to the post-policy era. Each point represents an active lung transplant program and the size of the point represents the relative number of lung candidates listed at each program during the pre-policy era. Overall, there were no noticeable trends in the percent change in transplant rates based on program size or geography.

Figure 72: Percent Change in the Number of Transplants per 100 Patient Years from the Pre-Policy Era to the Post-Policy Era by Transplant Program Size and Location



This figure displays each program's percent change in the number of transplants per 100 patient years (i.e., transplant rate) from the pre-policy era to the post-policy era. In addition, the programs are grouped based on their directional changes in waiting list mortality rate (number of waiting list removals for death or too sick to transplant per 100 patient years) and transplant rate from the pre-policy era to the post-policy era. On each map, the size of the points represent the relative number of lung candidates listed at each program during the pre-policy era. Most programs experienced either an increase in their transplant rate, decrease in their waiting list mortality rate, or both from the pre-policy era to the post-policy era. However, there were two programs across the East Coast and Midwest that experienced both an increase in their waiting list mortality rate and decrease in their transplant rate.

Figure 73: Percent Change in the Number of Transplants per 100 Patient Years from the Pre-Policy Era to the Post-Policy Era by Transplant Program Size, Location, and Directional Changes in Transplant Rate and Waiting List Mortality Rate