OPTN System Tracking: Lung Monitor Dashboard User Guide

OPTN **Organ Procurement & Transplantation Network**

Contents

For feedback or questions, e-mail DataProducts@unos.org

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Change History

Revision Date	Description
April 2024	Updated user guide to reflect dashboard change – Waitlist tabs now allow users to filter on waitlist removals (for death, too sick) as well as additions.

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Overview

The Organ Procurement & Transplantation Network (OPTN) System Tracking: Lung Monitor Dashboard allows users to review how changes in lung allocation have impacted registrations, transplants, donors recovered, utilization rates, non-use rates, and match efficiency.

Users can explore data by common demographic and transplant-related variables, select specific dates (for example, where policy changes occurred) and view changes before and after the selected date as well as monthly trends. Data are updated monthly and aggregate data are available for download. New data elements will be added to the dashboard as OPTN policy is updated to track changes and impacts in lung allocation.

Data Sources

The dashboard displays data commonly included in OPTN policy monitoring reports and uses data currently available in the OPTN data system. For instance, the number of waiting list registrations added from the Transplant Candidate Registration form and the number of transplants performed from the Transplant Recipient Registration form.

The analyses presented in the dashboard use data from:

- the OPTN waiting list
- the Deceased Donor Registration (DDR) form,
- the Transplant Candidate Registration (TCR) form
- the Transplant Recipient Registration (TRR) form
- the Transplant Recipient Follow-up (TRF) form.

A month data lag is incorporated in this dashboard to provide users with more recent data. Transplant hospitals have 90 days to submit DDR, TCR, TRR, and TRF forms. Missing data may be more prevalent in the most recent 90 days of data displayed. Data are subject to change based on future data submission or correction.

The following message appears when data from these instruments are selected:

"Per OPTN Policy 18.1, centers have 90 days to submit the data element you selected. The delay in submission may result in increased missing data and caution should be taken when interpreting data in the last 90 days."

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General Dashboard Features

Tooltips

Data visualized on the dashboard is also available in the tooltip. The tooltip is generated by hovering over an element of the dashboard with the mouse.
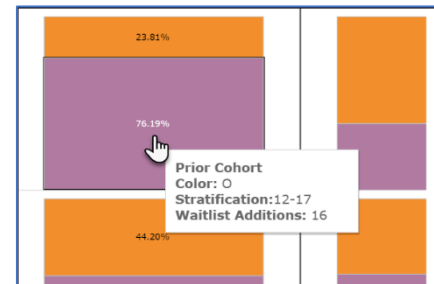
Downloading Data

Users can download a summary of the data displayed in Excel or CSV format. To download crosstab data where available

1. Select the **Download crosstab** button.
2. In the Select a sheet from this dashboard section, ensure that **1. [Sheet name]** is selected.
3. In the Select Format section, choose **Excel** or **CSV**.
4. Click **Download**.
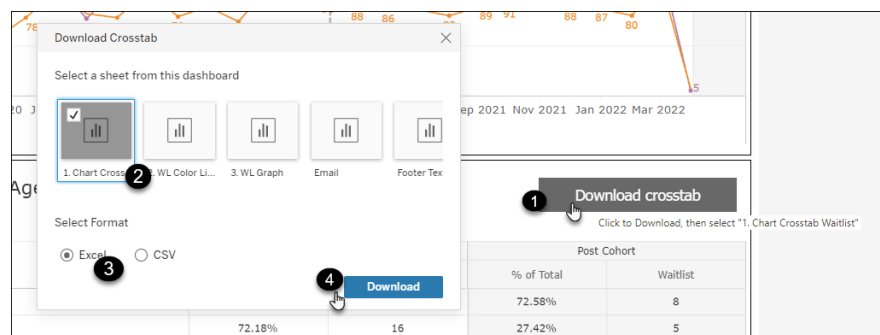
Getting Started

The Lung Monitor Dashboard is available to users on the OPTN website. Select Data & Calculators in the top navigation and then select OPTN System Tracking: Lung Monitor from the Dashboards & Metrics section.

When the dashboard initially displays, the Waitlist charts tab is selected by default. Other tabs include Waitlist maps, Donor charts, Donor maps, Transplant charts, Transplant maps, Utilization, Non-use, and Match efficiency.

Working with Date and Months in Cohort Filters

For each tab, the first step is to select a date and the number of months to include in the cohort. A cohort is a group with shared characteristics, and the makeup of the cohorts differs according to which tab is being viewed. On the Waitlist charts tab, for example, users can

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select a cohort of waitlist additions or waitlist removals (for death or too sick to transplant). Depending on the selection, data is displayed by date of listing or date of removal.

The date and months in the cohort work together to determine the date range for the period before the selected date (**prior** date range) and after the selected date (**post** date range). By default, the date is set to 24 months prior to the current date and there are 12 months included in the cohort.

After the date and months to include in cohort filters are set, date ranges and the number of days in the date range display below the filter options. Note that the number of days in cohorts may vary because of differences in the length of months.

Data Availability

Data is available for the prior five years and up to approximately one month before the current date. When selecting the date and months to include in the cohort, make sure that the prior date range begins no earlier than five years before the current date and that the post date range ends at least one month before the current date. For example, if the current date is May 20, 2023, data is available starting May of 2018 and the post date range should end no later than April 20, 2023.

If the dates selected include a range with unavailable data, the system automatically adjusts the number of months in the prior and post cohorts so that the range only includes dates with available data. A message displays detailing the adjustment.

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Waitlist, Donor, and Transplant Charts

The Waitlist charts, Donor charts and Transplant charts tabs allow users to choose up to two levels of criteria and compare waitlist registrations, donors, or transplants before and after the selected date. Users select one level of criteria to display by color, and can then select a second level of criteria to further stratify the results. See the Appendix for a list of criteria and descriptions.

Note: On the Waitlist Charts tab, users can select either **Waitlist Additions** or **Waitlist Removals for death or too sick** to compare. The dashboard defaults to Waitlist Additions.

Filters

Date: Select the date to use as the point of reference; this date will become the first date in the post date range.

Months to include in cohort: Select the number of months to include in the cohort.

> **Note**: After these filters are set, date ranges, number of days in date range, and the number of waitlist additions, donors, or transplants in the cohort display above the bar chart. Number of days in cohorts may vary because of difference in length of months.

Patient criteria: Select a patient criteria.

> **Note**: The charts display all waitlist registrations, donors, or transplants for the selected date range until criteria are selected.

Refine criteria values: By default, all values of the criteria are selected. Deselect the checkbox beside individual values to remove them from the visualization. For example, if Blood type is selected as the patient criteria, all blood types are included by default. Deselect the checkbox beside individual blood types to remove them from the visualization.

Stratification selector: Choose an additional criteria to further stratify the visualization.

Refine stratification: By default, all the values of the stratification criteria are selected. Deselect the checkbox beside individual values to remove them from the visualization.

The **Reset Filters** button resets the criteria and stratification filters. To change the date and months to include in analysis, make alternate selections in those fields.

> **Tip**: Use the Reset Filters button before choosing new criteria or stratifications to ensure the drop-downs include the correct options.

Visualizations
- The bar chart displays waitlist additions or removals, donors, or transplants by percent of cohort total, or by percent of cohort total within each stratification selected.
- The trend chart displays the waitlist additions or removals, donors, or transplants by the same selected criteria, showing the trend monthly over time. Trends extend beyond the selected date range and are displayed in grey.

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- The crosstab table displays the data used to create the visualizations. Data are available for download using the **Download crosstab** button. See General Dashboard Features for more information.

In this example, the user is viewing the number of donors by blood type for a single OPTN donor region on the Donor charts tab.

Waitlist, Donor, and Transplant Maps

The Waitlist maps, Donor maps, and Transplant maps tabs allow users to select a single criteria and view the prior and post date range percent change of waitlist registrations, donors, or transplants by OPTN region, donation service area (DSA), or state. See the Appendix for a list of criteria and descriptions.

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The crosstab table displays the data used to create the visualizations. Data are available for download using the **Download crosstab** button. See General Dashboard Features for more information.

In this example, the user is viewing waitlist additions by state for recipients ages 18-34 on the Waitlist maps tab.
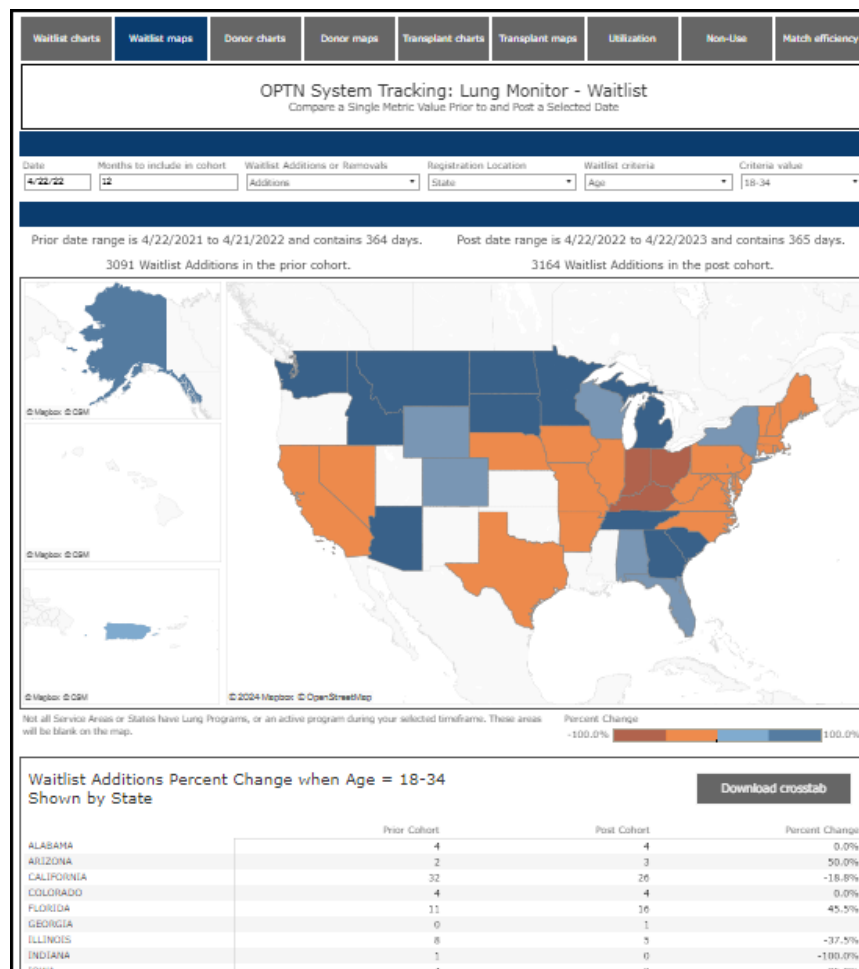
Filters
Note: A selection must be made for each filter before the map displays.

Date: Select the date to use as the point of reference; this date will become the first date in the post date range.

Months to include in cohort: Select the number of months to include in the cohort.

　　Note: After these filters are set, date ranges, number of days in date range, and the number of waitlist registrations, donors, or transplants in the cohort display above the map. Number of days in cohorts may vary because of difference in length of months.

Waitlist Additions or Removals (Waitlist Maps only): Select either waitlist additions or removals for death or too sick.

Location: Choose OPTN region, donation service area (DSA), or state to determine how the map is displayed. For the Waitlist maps tab, this is the Registration location; for the Donor

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maps tab, this is the Recovery location, and for the Transplant maps tab this is the Transplant hospital location.

Definitions: OPTN regions are the 11 geographic regions of the US as defined by the OPTN. Learn more about OPTN regions. DSAs are geographic areas designated by CMS that are served by one organ procurement organization (OPO), one or more transplant hospitals, and one or more donor hospitals.

Note: Areas without lung programs or active programs during the selected date range are blank on the map.

Waitlist/Donor/Transplant criteria: Select a criteria.

Criteria value: Select which value of the criteria to display on the map.

Utilization

The Utilization tab examines differences in lung utilization between prior and post cohorts for donors with at least one organ recovered for the purpose of transplant. 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 map allows users to view the prior and post percent change in utilization by geographic region, service area, or state after selecting a single criteria. See the Appendix for a list of criteria and descriptions.

- Unlike the Waitlist maps, Donor maps, and Transplant maps, the Utilization map will populate with utilization rates for all criteria values once the other fields are populated. You can refine the data shown by selecting a subset of the cohort from the Criteria value drop down menu.
- The line chart shows the lung utilization by month for the selected date range and criteria selected.
- The crosstab table displays the data used to create the visualizations. Data are available for download using the **Download crosstab** button. See General Dashboard Features for more information.

In this example, the user is viewing lung utilization by OPTN region for a single race/ethnicity. The map and table reflect data for this race/ethnicity by region; however, the line graph shows the national monthly average of lung utilization rates.

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OPTN System Tracking: Lung Monitor - Utilization
Compare a Single Metric Value Prior to and Post a Selected Date

Utilization monitors the number of lungs transplanted compared to the possible lungs transplanted from all organ donors.

Prior date range is 11/27/2020 to 11/26/2021 and contains 364 da..   Post date range is 11/27/2021 to 11/27/2022 and contains 365 day..
2625 Donors in the prior cohort.   2820 Donors in the post cohort.

Lung Utilization Rate by Month (average)

Lung Utilization when Race/Ethnicity = Hispanic/Latino shown by Region

	Prior Group (Organ Donors)	Pre Group Recovered Lungs	Prior Cohort Utilization Rate	Post Group (Organ Donor)	Post Group Recovered Lungs	Post Cohort Utilization Rate
Region 1	68	21	15.4%	85	19	11.3%
Region 2	183	57	15.6%	168	48	14.3%
Region 3	328	103	15.7%	337	131	19.4%
Region 4	365	244	33.4%	397	217	27.3%
Region 5	621	306	24.6%	708	333	23.5%
Region 6	47	30	31.9%	43	13	15.1%
Region 7	107	61	28.5%	98	36	18.4%
Region 8	79	45	28.5%	88	58	33.0%
Region 9	120	28	11.7%	168	50	17.6%
Region 10	40	30	37.5%	46	15	16.3%
Region 11	81	41	25.3%	70	36	25.7%

Filters

Date: Select the date to use as the point of reference; this date will become the first date in the post date range.

Months to include in cohort: Choose the number of months to include in the cohort.

> **Note**: After these filters are set, date ranges, number of days in date range, and the number of donors in the cohort display above the map. Number of days in cohorts may vary because of difference in length of months.

Transplant location: Choose OPTN region, donation service area (DSA), or state to determine how the map is displayed.

> **Definitions**: **Regions** are the 11 geographic regions of the US as defined by the OPTN. Learn more about OPTN regions. **Donation service areas** are geographic areas designated by CMS that are served by one organ procurement organization (OPO), one or more transplant centers, and one or more donor hospitals.

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Note: Areas without lung programs or active programs during the selected date range are blank on the map.
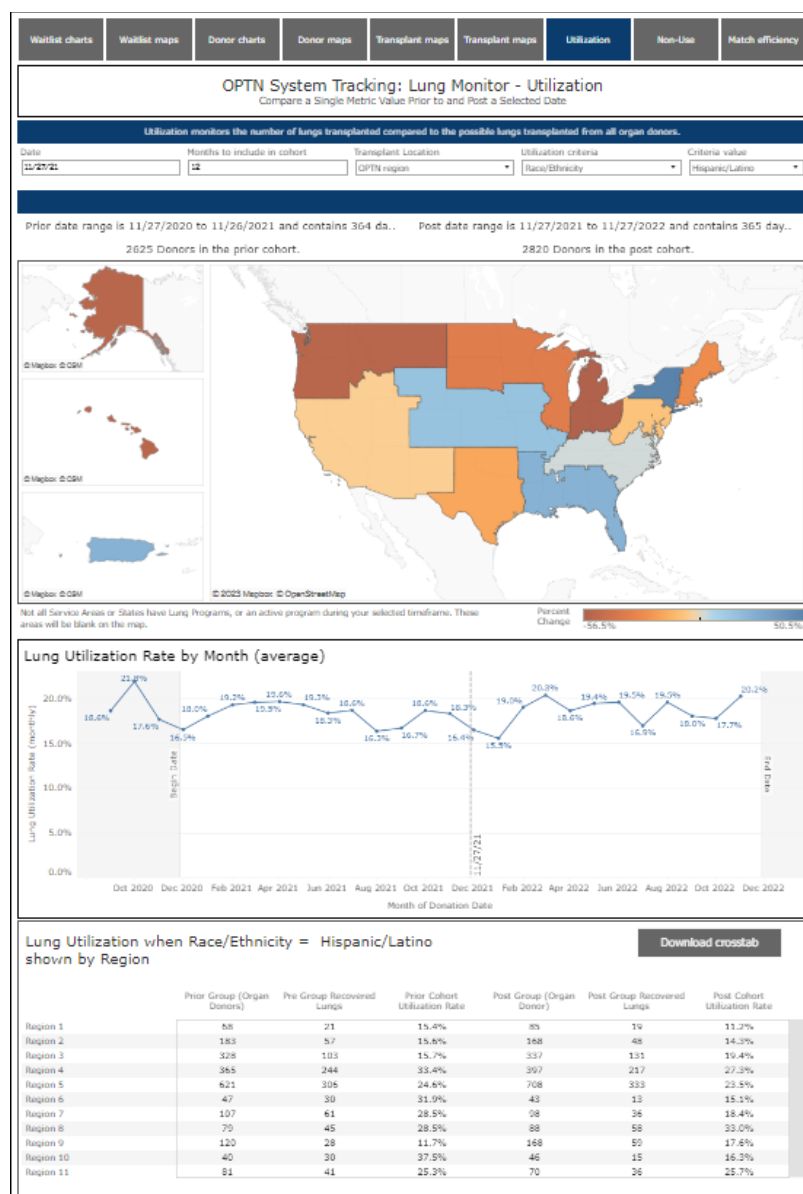
Utilization criteria: Select a utilization criteria.

Criteria value: Select which value of the utilization criteria to display on the map.

Non-Use

The Non-use tab examines differences in lung non-use between a prior and post donor cohort for donors with at least one organ recovered for the purpose of transplant. The lung non-use rate is expressed as the percentage of lungs that were recovered for transplant but were not eventually transplanted out of all lungs recovered for transplant.

- The map allows users to view the percent change in non-use prior to and post the selected date by geographic region, service area, or state. Similar to the Utilization page, the map will populate with non-use rates for all criteria values once the other fields are populated. You can refine the data shown by selecting a subset of the cohort from the Criteria value drop down menu.
- The bar chart displays the reasons for lung non-use prior to and post the selected date. The bar chart does not populate until a specific Criteria value is selected from the drop-down menu.
- The crosstab table displays the data used to create the visualizations. Data are available for download using the **Download crosstab** button. See General Dashboard Features for more information.

In this example, the user is viewing lung non-use by OPTN region for donors age 12-17. See the Appendix for a list of criteria and descriptions.

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OPTN System Tracking: Lung Monitor Non-Use
Compare a Single Metric Value Prior to and Post a Selected Date

Non-Use monitors lungs that were recovered with the intent to transplant but were not transplanted.

Date	Months to include in cohort	Transplant Location	Non-use criteria	Criteria value
11/27/21	12	OPTN region	Donor age	12-17

Prior date range is 11/27/2020 to 11/26/2021 and contains 364 da.. Post date range is 11/27/2021 to 11/27/2022 and contains 365 day..

2625 Donors in the prior cohort. 2820 Donors in the post cohort.

Not all Service Areas or States have Lung Programs, or an active program during your selected timeframe. These areas will be blank on the map.   Percent.. -100.0% ____ 215.2%

Lung Non-Use Reason

Lung Count may not Match Non-Use Reason Count due to double lung discards with different discard reasons.

Lung Non-Use when Donor Age = 12-17 shown by Region

Download crosstab

	Pre Group Non-Utilized Lungs	Pre Group Recovered Lungs	Pre Group Non-Use Rate	Post Group Non-Utilized Lungs	Post Group Recovered Lungs	Post Group Non-Use Rate
Region 1	2	13	15.4%	0	9	0.0%
Region 2	4	21	19.0%	2	23	8.7%
Region 3	11	55	20.0%	3	38	7.9%
Region 4	3	52	5.8%	8	44	18.2%
Region 5	0	44	0.0%	0	42	0.0%
Region 6	0	16	0.0%	0	13	0.0%
Region 7	2	25	8.0%	0	24	0.0%
Region 8	0	39	0.0%	2	37	5.4%
Region 9	0	4	0.0%	1	13	7.7%
Region 10	6	22	27.3%	1	18	5.6%
Region 11	6	44	13.6%	5	40	12.5%

Filters

Date: Select the date to use as the point of reference; this date will become the first date in the post date range.

Months to include in cohort: Choose the number of months to include in the cohort.

   Note: After these filters are set, date ranges, number of days in date range, and the number of donors in the cohort display above the map. Number of days in cohorts may vary because of difference in length of months.

Transplant location: Choose OPTN region, donation service area (DSA), or state to determine how the map is displayed.

   Definitions: **Regions** are the 11 geographic regions of the US as defined by the OPTN. Learn more about OPTN regions. **Service areas** are geographic areas designated by CMS that are served by one organ procurement organization (OPO), one or more transplant hospitals, and one or more donor hospitals.

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Note: Areas without lung programs or active programs during the selected date range are blank on the map.
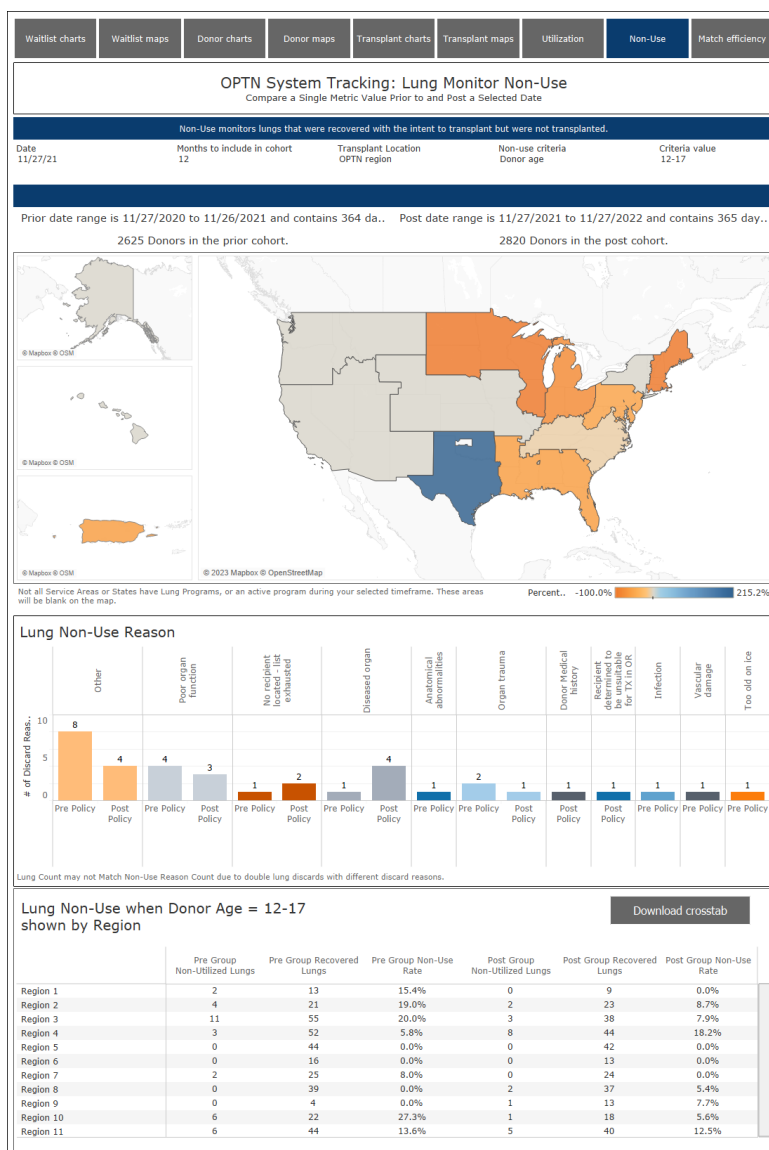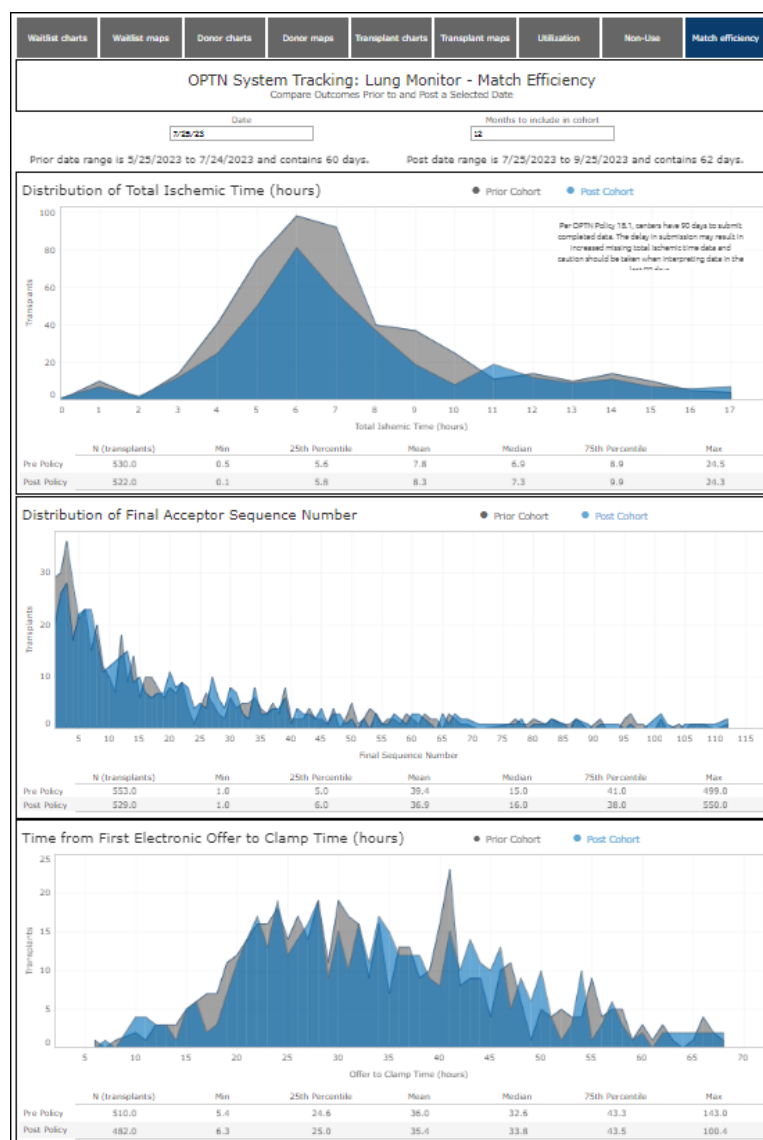
Non-use criteria: Select a non-use criteria.

Criteria value: Select which value of the non-use criteria to display on the map.

Match Efficiency

The Match efficiency tab displays three metrics commonly used to monitor the efficiency of the organ-matching process. Distribution of total ischemic time (hours), final acceptor sequence number, and time from first electronic offer to clamp time are visualized with area charts of prior and post cohorts. Each chart has a corresponding table with key statistical data points.

- **Ischemic time** is the total of cold ischemia time (the time the lung spent being preserved after recovery from the donor) and warm ischemic time (the time of Agonal Phase onset to the time when core cooling is initiated or the calculated time using the serial data to be collected beginning with the agonal phase and ending with the initiation of core cooling). Per Optn Policy 18.1, centers have 90 days to submit completed data. The delay in submission may result in increased missing total ischemic time data and caution should be taken when interpreting data in the last 90 days.
- The **final acceptor sequence number** is the sequence number of the final acceptor of the lung on the match run.
  - Note that accepting an organ offer does not necessarily mean that the transplant occurred; thus, the number of organ offers will be higher than the number of transplants performed during a given period.
- **Time from first electronic offer to clamp time** is the time between when the first offer was sent and the time when the flow of blood to the lung was clamped off during procurement.

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OPTN System Tracking: Lung Monitor - Match Efficiency
Compare Outcomes Prior to and Post a Selected Date.

Filters

Date: Select the date to use as the reference point; this date will become the first date in the post date range.

Months to include in cohort: Choose the number of months to include in the cohort.

> **Note**: After these filters are set, date ranges and number of days in date range display above the chart. Number of days in cohorts may vary because of difference in length of months.

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Appendix: Criteria Descriptions

Criteria	Criteria Descriptions
Age at transplant	Recipient's age at transplant.
Blood type	Candidate, donor or recipient's blood type.
CAS post transplant survival points	Number of points (out of 25) the candidate had for the CAS post-transplant outcomes attribute at the time of transplant.
CAS medical urgency points	Number of points (out of 25) the candidate had for the CAS medical urgency attribute at the time of transplant.
Cause of death	Donor's cause of death.
CPRA	Calculated Panel Reactive Antibody (CPRA) at the time of transplant. The percentage of deceased donors expected to have one or more of the unacceptable antigens indicated on the waiting list for the candidate. The CPRA is derived from HLA antigen, allele, and epitope genotype frequencies for the different populations in proportion to their representation in the national deceased donor population.
DCD donor	Organ recovered from a donor whose heart had irreversibly stopped beating.
Diagnosis	The candidate or recipient's diagnosis group.
Distance from donor	Distance from organ recovery to transplant recipient (nautical miles).
Donor age	The donor's age.
Donor region	The donor's OPTN region.
Donor state	The donor's state.
Height (cm)	Candidate's height at the time of listing or removal. Recipient's height at the time of transplant.
Ischemic time (hrs)	Ischemic time is defined as the sum of cold ischemic time, warm ischemic time, and anastomotic time. Learn more about ischemic time.
Age	Candidate's age when added to or removed from the waitlist.
BMI	Candidate's body mass index (BMI) when added to or removed from the waitlist.
Listing CAS medical urgency points	Number of points (out of 25) the candidate received for the CAS medical urgency attribute at the time of listing.
CPRA	Calculated Panel Reactive Antibody (CPRA) at the time of listing or removal. The percentage of deceased donors expected to have one or more of the unacceptable antigens indicated on the waiting list for the candidate. The CPRA is derived from HLA

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Criteria	Criteria Descriptions
	antigen, allele, and epitope genotype frequencies for the different populations in proportion to their representation in the national deceased donor population.
Listing region	OPTN region where candidate was listed.
Listing state	State where candidate was listed.
Multiorgan listing	Indicates if the candidate is listed for a lung and at least one other organ.
Multiorgan transplant	Indicates if the lung was transplanted with one or more other organs.
Payment type	Candidate's source of primary payment.
PHS increased risk	Donor had risk factors for blood-borne disease transmission.
Previous organ transplant	Indicates if the recipient previously received an organ transplant.
Procedure type	Procedure used during transplant.
Race/Ethnicity	Donor, candidate, or recipient's race/ethnicity.
Rural/urban scale	Rural/urban codes are assigned based on the candidate's/recipient's zip code. The rural/urban codes are based on rural-urban commuting area codes, which classify US census tracts using measures of population density, urbanization, and daily commuting. Learn more about rural/urban codes.
Sex at birth	The candidate, donor, or recipient's sex based on biologic or physiologic traits at birth.
Transplant BMI	Transplant recipient's body mass index (BMI).
Transplant region	OPTN region of the transplant hospital where the transplant took place. Learn more about OPTN regions.
Transplant state	State of the transplant hospital where the transplant took place.

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