

SRTR Data Dictionary

Chapter 1

Background and Overview

The Organ Procurement and Transplantation Network (OPTN) is a unique public-private partnership that links all professionals involved in the US donation and transplantation system. As one of OPTN's main collaborator, the Scientific Registry of Transplant Recipients (SRTR) is the organization that performs statistical analysis regarding organ transplantation in the US. Starting from October 1, 1987, the SRTR received a monthly snapshot of the OPTN data and the process is still ongoing. The current version of dataset has records up until the end of February 2025. The dataset covers transplant of 6 different organs including: Heart, lungs, kidneys, pancreas, liver and intestines. For each organ, the dataset can be categorized into the following groups:

1. Candidate file: The candidates table includes persons who are registered on the OPTN waiting list as well as additional candidates who have received a living donor organ, even if they have never been placed on the waiting list. The vast majority of candidate information comes from the candidate registration and waiting list information collected by the OPTN. Presents information about candidates during the time they are waiting to receive an organ.
2. Transplant file: Includes transplant records of all transplanted patients, including characteristics of the patient at the time of transplant and the transplant operation itself. Also, characteristics of the donor are added, as well as donor-recipient interactions, such as calculated HLA mismatch scores, blood compatibilities, and whether the organ was "shared" based on the relationship between the organ procurement organization (OPO) recovering the organ and the transplant center.
3. Transplant follow-up file: For heart and lung transplants, follow-ups take place at 1-year and then annually. For all the other organ transplants, follow-ups take place at 6-month, 1-year and then annually. The dataset includes characteristics of the patient at the time of follow-up and during the period since the transplant or last followup. Immunosuppression data for the follow-up period as well as malignancy data diagnosed during the followup period are also available.

4. Candidate History file: This table records characteristics that may change during the course of waiting list tenure, such as medical urgency status or model for end-stage liver disease (MELD) score for liver candidates. Each record in this table is associated with a time at which those characteristics began and ended.

1.1 Naming and Abbreviations

Datasets are named based on the organ type combined with the patient type. In this dataset, several organ types are involved: Kidney (KI), Pancreas (PA), Kidney-Pancreas (KIPA) etc. A full list of dataset glossary is available in the appendix. On the other hand, there are 4 main types of patient data: Candidate Data (CAND), Transplant Data (TX), Transplant follow-up (TXF), Statistical History of Candidates (STATHIST). For example, the dataset of all kidney and pancreas transplant candidates is named as CAND_KIPA. The dataset of kidney transplant records is called TX_KI.

In this file, both dataset names and variable names will be displayed in capitalized letters. Dataset names will be displayed in **bold characters**. For example, **CAND_KIPA** is a dataset name while CAN_RACE is a variable name.

1.2 Creating New Variables

Some new variables are not included in the original dataset and must be created. A list of variables is provided as follows.

The first column is the name of the variable. The second column refers to where to look for information to create the new variable. The last column provides the formula, and some formulae are too complicated, and the detailed methods are included in the appendix.

Variable Name	Dataset	Description	Formula
KDPI	Transplant File	Measures quality of organs	See Appendix
EPTS	Candidate File	Measures Post-Tx Survival	See Appendix
eGFR	Transplant File and Follow-up File	Measures Kidney Functions	See Appendix
Post-transplant Survival	Transplant File	Records patients' death and/or graft failure information post-transplant	See section 1.3
Transplant Rate	Candidate File	Measures how quickly patients are moving from waitlist to transplant	$\frac{Tx \text{ Count}}{Total \text{ People Time}}$
Pre-transplant Mortality Rate	Candidate File	Measures how quickly patients die on the waitlist	$\frac{PreTx \text{ Death Count}}{Total \text{ People Time}}$
Post-transplant Mortality Rate	Transplant File	Measures how quickly patients die after transplantation	$\frac{PostTx \text{ Death Count}}{Total \text{ People Time}}$

Table 1.1:

1. Abbreviations used: KDPI: Kidney Donor Profile Index; EPTS: Estimated Post-Transplant Survival; eGFR: Estimated Glomerular Filtration Rate; Tx: Transplant;
2. Both KDPI and EPTS require external mapping tables that are not part of the dataset;
3. KDPI Reference: https://optn.transplant.hrsa.gov/media/j34dm4mv/kdpi_guide.pdf
4. EPTS Reference: https://optn.transplant.hrsa.gov/media/pn1pt2bc/epts_guide.pdf
5. eGFR Reference: <https://www.kidney.org/ckd-epi-creatinine-equation-2021-0>

1.3 Common outcomes of interest

The SRTR dataset is widely used to analyze transplant outcomes. Some example outcomes used include the following:

1. Time to transplant. Time to transplant is defined as the time between the date of waitlist entry and the date of transplant. More commonly, we look at the transplant rate, which is defined as:

$$Transplant \text{ rate} = \frac{Total \text{ Transplant Counts}}{Total \text{ Person Time}}$$

The plot 1.1 shows different stages of COVID and reflects the implementation of the Kidney Allocation System (KAS) 250 in March 2021.

2. Transplant-free death. Also known as pre-transplant deaths. This is defined as death among

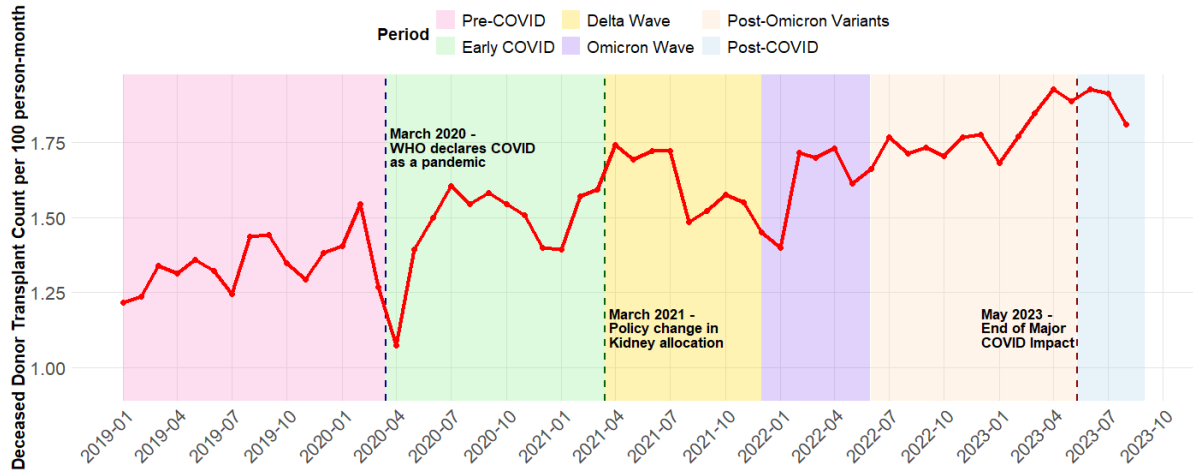


Figure 1.1: Overall Deceased Donor Transplant Rate

candidates who remain on the waiting list and have not received transplants. For transplant candidates, death information can come from 2 sources:

- Death while on waitlist;
- Death after being removed from waitlist;

Transplant-free death only considers deaths while on waitlist. This can be obtained by looking at the number of patients who are removed from the waitlist due to death. All other reasons resulting in removal from waitlist are treated as censoring events.

The plot 1.2 shows the pre-transplant mortality rate, which is defined as:

$$\text{PreTransplant Mortality rate} = \frac{\text{Total PreTransplant Deaths}}{\text{Total Person Time}}$$

It is used to assess the well-being of patients who remain on the waiting list. During COVID, COVID-related deaths were also included as part of pre-transplant deaths.

3. Post-transplant Survival: 3 survival outcomes are commonly used.

- All-cause graft survival: Both graft failure and patient death count as an event;
- Death-censored graft survival: Only graft failure is considered an event and death is considered as censoring;
- Patient survival: Death is considered as an event, and graft failure is considered as censoring.

Patients are followed until graft failure, retransplant, or death, with follow-up censored at the last OPTN follow-up date, resulting in death information from 3 sources:

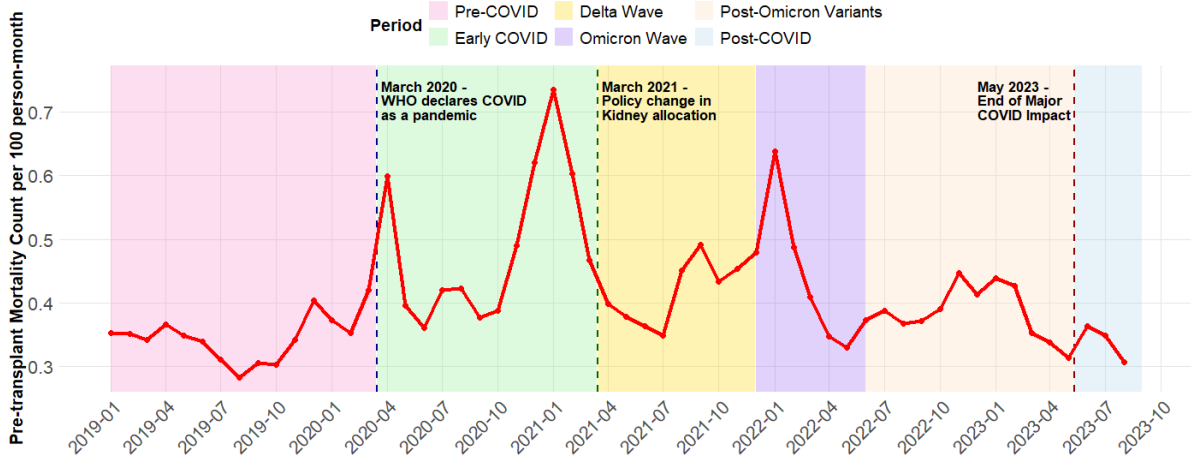


Figure 1.2: Overall Pre-transplant Mortality Rate

- Death from follow-up;
- Death from Social Security Administration;
- Death from Organ Procurement and Transplantation Network (OPTN);

Following the 3 death information sources, we provide a way of defining post-transplant deaths:

- Hierarchy way: The way adopted by SRTR. The follow-up death date is used first. If the follow-up death date is NA, use the OPTN death date. If the OPTN death date is also NA, use the SSA death date.

In case there are discrepancies between OPTN death dates and SSA death dates, it is recommended to use SSA death date over the OPTN death date.

The plot 1.3 shows the post-transplant mortality rate using the hierarchy way of definition, which is often used to assess the safety and effectiveness of transplant surgery. The rate is defined as:

$$PostTransplant\ Mortality\ rate = \frac{Total\ PostTransplant\ Deaths}{Total\ Person\ Time}$$

4. Other post-transplant outcomes: Several outcomes other than survival are recorded in the transplant follow-up dataset like the Karnofsky Scale which reflects the patients' physical capability. These records can be found in transplant follow-up dataset at each available follow-up time point. A score of at least 80% is considered to be in normal range while a score of between 50% to 70% is considered to be moderately impaired. A score of less or equal to 40% is considered to be severely impaired.

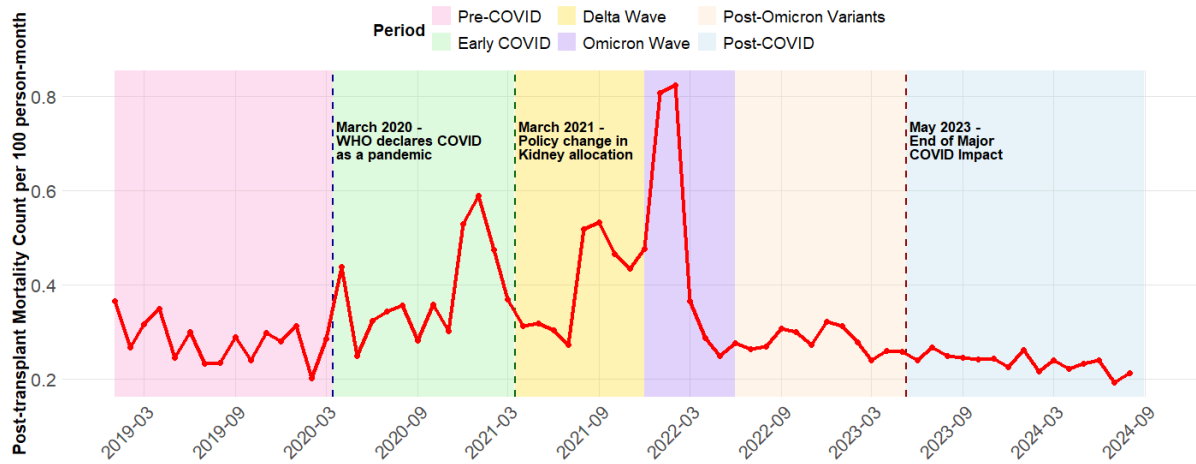


Figure 1.3: Overall Post-transplant Mortality Rate

The following graph displayed changes in the Karnofsky scale categories for transplant patients. The NA values are a result of death, graft failure and loss to follow-up.

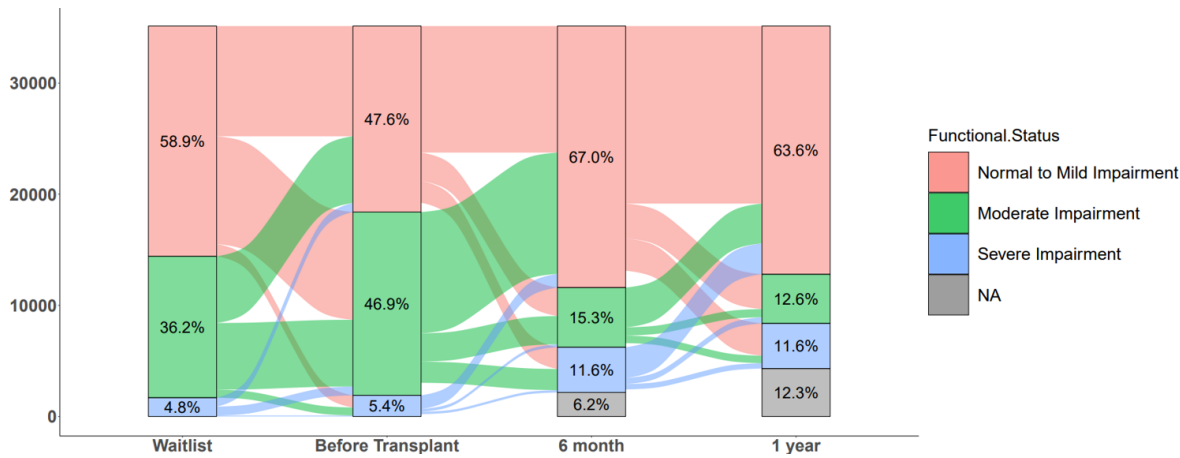


Figure 1.4: Sankey Diagram of Karnofsky Scale

1.4 Organ Allocation

OPTN has developed policies [1] regarding organ allocation. Patients are awarded Kidney Allocation Score based on the following variables. First, patients are divided into categories provided in the table 1.5, 1.6 and 1.7. Then, within each category, the candidates are ranked based on a Kidney Allocation Score. Details of the Kidney Allocation Score is provided in the appendix.

KDPI ≤ 20%			20% < KDPI ≤ 35%			35% < KDPI ≤ 85%			85% < KDPI ≤ 100%		
Candidate characteristics	Distance	Donor blood Type	Candidate characteristics	Distance	Donor blood Type	Candidate characteristics	Distance	Donor blood Type	Candidate characteristics	Distance	Donor blood Type
0-ABDR mismatch, CPRA=100%, blood type ok	250NM	Any	0-ABDR mismatch, CPRA=100%, blood type ok	250NM	Any	0-ABDR mismatch, CPRA=100%, blood type ok	250NM	Any	0-ABDR mismatch, CPRA=100%, blood type ok	250NM	Any
CPRA=100%, blood type ok	250NM	Any	CPRA=100%, blood type ok	250NM	Any	CPRA=100%, blood type ok	250NM	Any	CPRA=100%, blood type ok	250NM	Any
0-ABDR mismatch, CPRA=100%, blood type ok	Nation	Any	0-ABDR mismatch, CPRA=100%, blood type ok	Nation	Any	0-ABDR mismatch, CPRA=100%, blood type ok	Nation	Any	0-ABDR mismatch, CPRA=100%, blood type ok	Nation	Any
CPRA=100%, blood type ok	Nation	Any	CPRA=100%, blood type ok	Nation	Any	CPRA=100%, blood type ok	Nation	Any	CPRA=100%, blood type ok	Nation	Any
Prior living donor, blood type ok	250NM	Any	Prior living donor, blood type ok	250NM	Any	Prior living donor, blood type ok	250NM	Any	Medically Urgent	250NM	Any
Registered prior to 18 years old, blood type ok	250NM	Any	Registered prior to 18 years old, blood type ok	250NM	Any	Medically Urgent	250NM	Any	0-ABDR mismatch, CPRA=99%, blood type ok	250NM	Any
Medically Urgent	250NM	Any	Medically Urgent	250NM	Any	0-ABDR mismatch, CPRA=99%, blood type ok	250NM	Any	CPRA=99%, blood type ok	250NM	Any
0-ABDR mismatch, CPRA=99%, blood type ok	250NM	Any	0-ABDR mismatch, CPRA=99%, blood type ok	250NM	Any	CPRA=99%, blood type ok	250NM	Any	0-ABDR mismatch, CPRA=98%, blood type ok	250NM	Any
CPRA=99%, blood type ok	250NM	Any	CPRA=99%, blood type ok	250NM	Any	0-ABDR mismatch, CPRA=98%, blood type ok	250NM	Any	CPRA=98%, blood type ok	250NM	Any
0-ABDR mismatch, CPRA=98%, blood type ok	250NM	Any	0-ABDR mismatch, CPRA=98%, blood type ok	250NM	Any	CPRA=98%, blood type ok	250NM	Any	0-ABDR mismatch, blood type ok	250NM	Any
CPRA=98%, blood type ok	250NM	Any	CPRA=98%, blood type ok	250NM	Any	0-ABDR mismatch, blood type identical	250NM	Any	0-ABDR mismatch, CPRA ≥ 80%, blood type ok	Nation	Any
0-ABDR mismatch, top 20% EPTS, and blood type identical	250NM	Any	0-ABDR mismatch, blood type identical	250NM	Any	0-ABDR mismatch, CPRA ≥ 80%, and blood type identical	Nation	Any	0-ABDR mismatch, CPRA ≥ 21% but ≤ 79%, and blood type identical	Nation	Any
0-ABDR mismatch, top 20% EPTS, CPRA ≥ 80%, and blood type identical	Nation	Any	0-ABDR mismatch, CPRA greater than or equal to 80%, and blood type identical	Nation	Any	0-ABDR mismatch, CPRA ≥ 21% but ≤ 79%, less than 18 at time of match, and blood type identical	Nation	Any	0-ABDR mismatch, blood type B	250NM	O
0-ABDR mismatch, CPRA ≥ 21% but ≤ 79%, less than 18 at time of match, and blood type identical	Nation	Any	0-ABDR mismatch, CPRA ≥ 21% but ≤ 79%, less than 18 at time of match, and blood type identical	Nation	Any	0-ABDR mismatch, CPRA ≥ 0% but ≤ 20%, less than 18 at time of match, and blood type identical	Nation	Any	0-ABDR mismatch, CPRA ≥ 80%, and blood type B	Nation	O
0-ABDR mismatch, less than 18 years old at time of match, CPRA ≥ 0% but ≤ 20%, and blood type identical	Nation	Any	0-ABDR mismatch, CPRA ≥ 0% but ≤ 20%, less than 18 at time of match, and blood type identical	Nation	Any	0-ABDR mismatch, CPRA ≥ 21% but ≤ 79%, and blood type identical	Nation	Any	0-ABDR mismatch, CPRA ≥ 21% but ≤ 79%, and blood type B	Nation	O
0-ABDR mismatch, top 20% EPTS, CPRA ≥ 21% but ≤ 79%, and blood type identical	Nation	Any	0-ABDR mismatch, CPRA ≥ 21% but ≤ 79%, and blood type identical	Nation	Any	0-ABDR mismatch, and blood type B	250NM	O	0-ABDR mismatch, blood type permissible	250NM	Any
0-ABDR mismatch, top 20% EPTS, and blood type B	250NM	O	0-ABDR mismatch, blood type B	250NM	O	0-ABDR mismatch, CPRA ≥ 80%, and blood type B	Nation	O	0-ABDR mismatch, CPRA ≥ 80%, and blood type permissible	Nation	Any
0-ABDR mismatch, top 20% EPTS or less than 18 years at time of match run, CPRA ≥ 80%, and blood type B	Nation	O	0-ABDR mismatch, CPRA ≥ 80%, and blood type B	Nation	O	0-ABDR mismatch, CPRA ≥ 21% but ≤ 79%, less than 18 at time of match, and blood type B	Nation	O	0-ABDR mismatch, CPRA ≥ 21% but ≤ 79%, and blood type permissible	Nation	Any
0-ABDR mismatch, less than 18 at time of match, CPRA ≥ 21% but ≤ 79%, and blood type B	Nation	O	0-ABDR mismatch, CPRA ≥ 21% but ≤ 79%, less than 18 at time of match, and blood type B	Nation	O	0-ABDR mismatch, CPRA ≥ 0% but ≤ 20%, less than 18 at time of match, and blood type B	Nation	O	Prior liver, heart, and lung recipients who meet the qualifying criteria according to Policy 8.4.G, 8.4.H, 8.4.I	250NM	Any
0-ABDR mismatch, less than 18 at time of match, CPRA ≥ 0% but less than or	Nation	O	0-ABDR mismatch, CPRA ≥ 0% but less than or equal to 20%, less than 18 at	Nation	O	0-ABDR mismatch, CPRA ≥ 21% but ≤ 79%, and blood type B	Nation	O	Blood type B	250NM	A2 or A2B

Figure 1.5: Allocation Policy Table Part 1

equal to 20%, and blood type B			time of match, and blood type B								
0-ABDR mismatch, top 20% EPTS, CPRA \geq 21% but \leq 79%, and blood type B	Nation	O	0-ABDR mismatch, CPRA \geq 21% but \leq 79%, and blood type B	Nation	O	0-ABDR mismatch, blood type permissible	250NM	Any	All remaining candidates, blood type ok	250NM	Any
0-ABDR mismatch, top 20% EPTS, and blood type permissible	250NM	Any	0-ABDR mismatch, blood type permissible	250NM	Any	0-ABDR mismatch, CPRA \geq 80%, and blood type permissible	Nation	Any	Candidates who have specified they are willing to accept both kidneys from a single deceased donor, blood type ok	250NM	Any
0-ABDR mismatch, top 20% EPTS, CPRA \geq 80%, and blood type permissible	Nation	Any	0-ABDR mismatch, CPRA greater than or equal to 80%, and blood type permissible	Nation	Any	0-ABDR mismatch, CPRA \geq 21% but \leq 79%, less than 18 years old at time of match, and blood type permissible	Nation	Any	Blood type B	Nation	A2 or A2B
0-ABDR mismatch, less than 18 years old at time of match run, CPRA \geq 21% but \leq 79%, and blood type permissible	Nation	Any	0-ABDR mismatch, CPRA \geq 21% but \leq 79%, less than 18 at time of match, and blood type permissible	Nation	Any	0-ABDR mismatch, CPRA \geq 0% but \leq 20%, less than 18 years old at time of match, and blood type permissible	Nation	Any	All remaining candidates, blood type ok	Nation	Any
0-ABDR mismatch, less than 18 years old at time of match run, CPRA \geq 0% but \leq 20%, and blood type permissible	Nation	Any	0-ABDR mismatch, CPRA \geq 0% but \leq 20%, less than 18 at time of match, and blood type permissible	Nation	Any	0-ABDR mismatch, CPRA \geq 21% but \leq 79%, and blood type permissible	Nation	Any	Candidates who have specified they are willing to accept both kidneys from a single deceased donor, blood type identical or permissible	Nation	Any
0-ABDR mismatch, top 20% EPTS, CPRA \geq 21% but \leq 79%, and blood type permissible	Nation	Any	0-ABDR mismatch, CPRA \geq 21% but \leq 79%, and blood type permissible	Nation	Any	Prior liver, heart, and lung recipients who meet the qualifying criteria according to Policy 8.4.G, 8.4.H, 8.4.I, blood type permissible or identical	250NM	Any			
Top 20% EPTS, blood type B	250NM	A2 or A2B	Prior liver, heart, and lung recipients who meet the qualifying criteria according to Policy 8.4.G, 8.4.H, 8.4.I, blood type permissible or identical	250NM	Any	Blood type B	250NM	A2 or A2B			
Top 20% EPTS, blood type ok	250NM	Any	Blood type B	250NM	A2 or A2B	All remaining candidates, blood type ok	250NM	Any			
0-ABDR mismatch, EPTS greater than 20%, blood type identical	250NM	Any	All remaining candidates, blood type ok	250NM	Any	Blood type B	Nation	A2 or A2B			
0-ABDR mismatch, EPTS greater than 20%, CPRA \geq 80%, and blood type identical	Nation	Any	Registered prior to 18 years old, blood type ok	Nation	Any	All remaining candidates, blood type ok	Nation	Any			
0-ABDR mismatch, EPTS greater than 20%, CPRA \geq 21% but \leq 79%, and blood type identical	Nation	Any	Blood type B	Nation	A2 or A2B	Candidates who have specified they are willing to accept both kidneys from a single deceased donor, blood type ok	250NM	Any			
0-ABDR mismatch, EPTS greater than 20%, and blood type B	250NM	O	All remaining candidates, blood type ok	Nation	Any	Candidates who have specified they are willing to accept both kidneys from a single deceased donor, blood type identical or permissible	Nation	Any			
0-ABDR mismatch, EPTS greater than 20%, CPRA greater than or equal to 80%, and blood type B	Nation	O									

Figure 1.6: Allocation Policy Table Part 1

0-ABDR mismatch, EPTS greater than 20%, CPRA \geq 21% but \leq 79%, and blood type B	Nation	O									
0-ABDR mismatch, EPTS greater than 20%, and blood type permissible	250NM	Any									
0-ABDR mismatch, EPTS greater than 20%, CPRA \geq 80%, and blood type permissible	Nation	Any									
0-ABDR mismatch, EPTS greater than 20%, CPRA \geq 21% but \leq 79%, and blood type permissible	Nation	Any									
EPTS greater than 20%, blood type B	250NM	A2 or A2B									
All remaining candidates, blood type ok	250NM	Any									
Registered prior to 18 years old, blood type ok	Nation	Any									
Top 20% EPTS, blood type B	Nation	A2 or A2B									
Top 20% EPTS, blood type ok	Nation	Any									
All remaining candidates, blood type ok	Nation	Any									

Figure 1.7: Allocation Policy Table Part 1

Here is a list of variables used in the category classification and calculation of the Kidney Allocation Score.

- cPRA (Calculated Panel Reactive Antibody) Score: Estimates the percentage of donors whose organs might be incompatible with the candidate. Candidates with a high cPRA score can only accept organs from a small number of donors and will be given higher priority.
- ABDR-mismatch: Measures the histocompatibility between the donor and the potential recipient. A lower number of mismatch means better compatibility and gives higher priority.
- Blood Type: Higher priority will be given to candidates with permissible or compatible blood type.
- Prior Living Donor: Candidates who were living donors will be given higher priority.
- Waiting Time: Candidates with longer wait time will be given higher priority.
- Distance to the Donor Hospital: Candidates who are closer to the donor hospital will receive higher priority.

However, the Kidney Allocation Score mentioned above is not the only component used to determine the priority. Medical Urgency also needs to be considered, which is defined as:

- Medical Urgency: Indicating whether the patient is on dialysis and has exhausted all available dialysis methods. If the nephrologist and transplant surgeon determines that dialysis no longer works, the patient can be classified as medically urgent.

Within the same category, candidates who are medically urgent will always have priority over candidates who are not medically urgent. Then, among medically urgent candidates, a longer time in the urgency status means higher priority. Then, candidates are sorted based on the Kidney Allocation Score.

1.5 Ongoing Work on Allocation Policy

In December 2018, the OPTN Board of Directors approved the continuous distribution framework for allocation of all organs. Continuous distribution will rank waiting list candidates based on points related to various factors, such as medical urgency, post-transplant survival, candidate biology, patient access, and placement efficiency. Continuous distribution will remove the hard boundaries built into the current framework to increase equity for patients and transparency in the system.

Namely, the goal is to:

- Remove the hard definition of classifications as shown in figure 1.5, 1.6 and 1.7.
- Remove the hard definition of geographical boundary of 250 nautical miles.

As a result, all candidates will be given a score calculated by:

$$Score_i = \sum_j \{R_j(x_{ij}(candidate_i, donor)) \times W_j \times M_j(donor)\}$$

where i iterates through all donors and j iterates through all metrics. R_j is the rating scale, which is a function of the candidate metrics and donor metrics. W_j is the weight of metrics j and M_j is the donor weight modifier of metrics j .

Currently, the included metrics are summarized in the table 1.8.

Attributes	Goal	Modeling Objective
Medical Urgency Definition	Medical Urgency	Maintain high priority similar to current policy
DR Matching	Post-Transplant Survival	Maintain similar priority to current policy Minimize graft failure
EPTS/KDPI	Post-Transplant Survival	Match low KDPI kidneys to low EPTS candidates Maintain transplant rates for EPTS 0-20 Equalize access for EPTS 21+
Blood Type	Candidate Biology	No decrease in access, especially for O and B blood type candidates
CPRA	Candidate Biology	Equalize access across CPRAs Maximize access for CPRA 99.9+
Prior Living Donors	Patient Access	Maintain high priority, similar to pediatric access
Pediatrics	Patient Access	Maintain high priority, similar to PLD access
Safety Net	Patient Access	Maintain similar priority to current policy
Qualifying Time	Patient Access	Maximize median qualifying time at transplant
Proximity Efficiency	Placement Efficiency	Minimize distance traveled, especially for high KDPI kidneys Relax constraint for pediatric and highly sensitized candidates

Figure 1.8: Metrics Table used in the Composite Allocation Score.

Chapter 2

Dataset Description

2.1 Kidney and Pancreas

This dataset only includes the description of the most used and studied dataset, and for each dataset listed here, only a selected variables of interest are described here. A complete list of datasets and variables can be found via this link <https://www.srtr.org/requesting-srtr-data/saf-data-dictionary/>:

1. **TX_KI**: This file includes one record per transplant. Only kidneyt records are included, without any kidney-pancreas transplant records, though any other multi-organ transplantation are included. Information includes characteristics of the patient at the time of transplant and the transplant operation itself. A total of 604,267 records were provided in this file, ranging from October 1987 to February 2025.

From our experience, usually transplant data from the last few months of the dataset is not very reliable, and we refrain from including them in the analysis. For example, the current dataset ends at the end of February 2025, and we usually do not use the last 6 months of data. This process is a precaution taken from an empirical perspective, and users may choose if they would like to take similar measures or not.

The plot 2.1 used the cyan color to highlight the pre-transplant mortality rate from the most recent update of the SRTR data. The most recent update of the data ended at the end of February 2025. As we can see, the cyan line shows a downward trend. This phenomenon is often observed because of a lag in recording death's information. As a result, we often exercise caution and remove the last few months' (e.g. 6 months) data.

A total of 284 variables are recorded in the file. The table 2.1 summarizes the most important

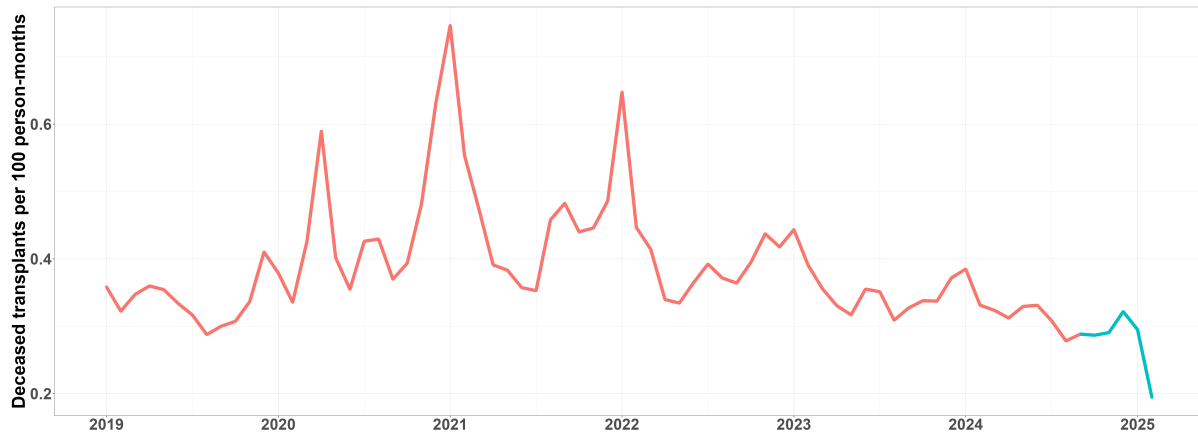


Figure 2.1: Pre-transplant Mortality Rate Highlighting the Last Few Months

variables recorded in the file.

Donor Info	Patient Info	Transplant Record	Outcome
Donor Age	Age at Listing	Age at Transplant	Follow-up Death Date
Donor Height and Weight	Gender	Transplant Date	SSA Death Date
Donor Race and Ethnicity	Race and Ethnicity	Body Mass Index	OPTN Death Date
Donor has hypertension	ABO Blood Type	Creatinine before Tx	Graft Failure Date
Donor has diabetes	Diabetes History	Creatinine at Discharge	Last Follow-up Date
Donor Serum Creatinine	Listing Date	Length of Stay Post-Tx	Last Follow-up Status
Donor HCV Status	Previous Transplant	Discharge Date	Cohort Censor Date
Donor Cause of Death			
Donor DCD Status			
Donor Type			

Table 2.1: Table of attributes recorded in the TX_KI dataset. A complete list of variables is provided in the dataset. Some abbreviations used above are listed below:

DCD: Donation after Cardiac Death; Tx: Transplantation; SSA: Social Security Administration

The donor info column contains all the variables needed to calculate the kidney donor privilege index (KDPI). KDPI is a score from 0 to 100 describing the quality of a kidney from a deceased donor. Attributes from Donor Age to Donor DCD Status are used in the KDPI formula. Detailed information on KDPI is provided in the Appendix. The last variable Donor Type tells users if the organ is from a living donor or a deceased donor.

The patient info column contains basic patient characteristics recorded when patients entered the

waitlist. The previous transplant indicated here is a set of variables that indicate if the patient has a previous transplant to the heart, kidney, etc. Users can decide if they want to include patients with multiple transplants by filtering using this variable.

The transplant record column contains patient medical information from the time of transplant to the time of discharge. The transplant date recorded here combined with the listing date in the patient info column, can be used to define a commonly used outcome that is time to transplant. Also, creatinine reflects patients' kidney function and is required to calculate patients' Estimated Glomerular Filtration Rate (eGFR). A formula of eGFR is provided in the appendix.

The outcome column contains information of patient follow up. Each transplant patient has follow-up at 6 month, 1 year and then annually. If a patient is found dead during one of the follow-ups, a follow-up death date is recorded. Also, SRTR uses external death data from the Social Security Administration (SSA) and OPTN to obtain extra death dates. Sometimes, the death dates do not necessarily match and users may decide how to define post-transplant death at their discretion. In addition, if the user is found to have a graft failure at follow-up, a follow-up graft failure date is recorded. Meanwhile, the last follow-up date combined with last follow-up status and cohort censor date can be used to define a censoring time.

Variable	Missing%	Description	Stat
Donor Age	0.003%	Age in years	Min: 0, Median: 39, Max: 95
Donor Height	11.952%	Height in centimeters	Min: 1, Median: 170.2, Max: 251.5
Donor Weight	9.384%	Weight in Kilograms	Min: 0.454, Median: 77.112, Max: 453.146
Donor Race	0.099%	Race in 6 categories	Asian: 0.025%,

2. CAND_KIPA: This file includes persons who are registered on the OPTN waiting list as well as additional candidates who have received a living donor organ, even if they have never been placed on the waiting list. All transplant types including kidney, pancreas and kidney-pancreas were included. The vast majority of candidate information comes from the candidate registration and waiting list information collected by the OPTN. Currently, there are a total of 1,199,290 candidates recorded. The time period covered is from March 1970 to February 2025. Attributes recorded candidate characteristics like age at listing, race/ethnicity, date of listing, date of removal, reason of removal etc. A total of 284 variables are recorded in the file. The table ?? summarizes the most important variables recorded in the file.

.1 General

The following datasets include general information applicable to all organs.

1. **DONOR_DECEASED**: This file includes information of all 303,014 deceased donors whose organs were recovered from October 1987 to February 2025. Attributes recorded including donor characteristics including donor age, donor race/ethnicity, donor blood type, date of recovery as well as donor medical history like the cause of death etc.
2. **DONOR_DISPOSITION**: Some organs recovered from deceased donors were not used in transplant and they were disposed instead. This file includes 2,486,650 records of discarded organs recovered from October 1987 to February 2025. Attributes recorded including the organ type, reason of disposition, date of recovery, storage solution etc.
3. **DONOR_LIVE**: Similar to the deceased donor file, but only focuses on the living donors. It includes data of all 200,510 living donors whose organs were recovered from October 1987 to February 2025.
4. **DON_LIV_FOL**: All living donor were followed to a minimum of 2 years. The file includes follow-up records at the time of 6-month, 1-year and 2-year post transplant. It includes 394,502 records of 200,510 living donors up until February 2025. Attributes recorded include various biomarkers like serum albumin, serum creatinine as well as other recorded diseases like diabetes etc.
5. **IMMUNO**: Transplant patients may be given immunosuppression medications at the time of transplant. This file contains the data about Immunosuppression medications being given a transplant recipient at the time of transplant. One row corresponds to one record of medication. It includes 3,605,340 records of medication for transplant patients. Attributes recorded include the type of drug given, the number of days for the drug etc.
6. **FOL_IMMUNO**: Similar to the IMMUNO dataset but instead includes the immunosuppression medication given at the time of transplant follow-up. A total of 9,124,602 medication records were recorded at transplant follow-up.
7. **MALIG**: This file contains data about any malignancies diagnosed during the period for the follow-up it is associated with. It includes 197,850 records of malignancy diagnosed at the time of follow-up. Attributes recorded include the type of malignancy, the type of treatment, the type of organ transplanted etc.

8. TREATMENT: For each De Nova Solid tumor reported on the MALIG file mentioned above, a treatment record was given in this file. A total of 190,606 records was provided in this table. Attributes recorded include the malignancy ID, best treatment response, date of diagnosis etc.

9. INSTITUTION: This file records institutions information. All institutions involved in the program were recorded. Currently, there are a total of 722 centers. Attributes recorded include center code, center name, center type, address of center, etc.

Bibliography

- [1] Optn policies effective march 27, 2025.