MPSC: Enhance Transplant Program Performance Monitoring System

Proposed Metrics

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Chair, Membership and Professional Standards Committee (MPSC)

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Director, Scientific Registry of Transplant Recipients (SRTR)

What are the goals of the OPTN MPSC Performance Monitoring Enhancement project?

- To develop a holistic review of member performance throughout all phases of transplantation.
- To identify real-time patient safety issues.
- To provide support and collaboration to transplant programs for identified opportunities for improvement.
- To evaluate and modify any system of review to ensure maximum support for increasing the number transplants, promoting equitable access to transplantation and fostering innovation.
- To not let perfect be the enemy of progress, the process will be iterative.

These new metrics are for the MPSC to perform its oversight responsibility.

These new metrics are not intended for use by the public or payers to "rate" transplant programs.

What makes a good metric?

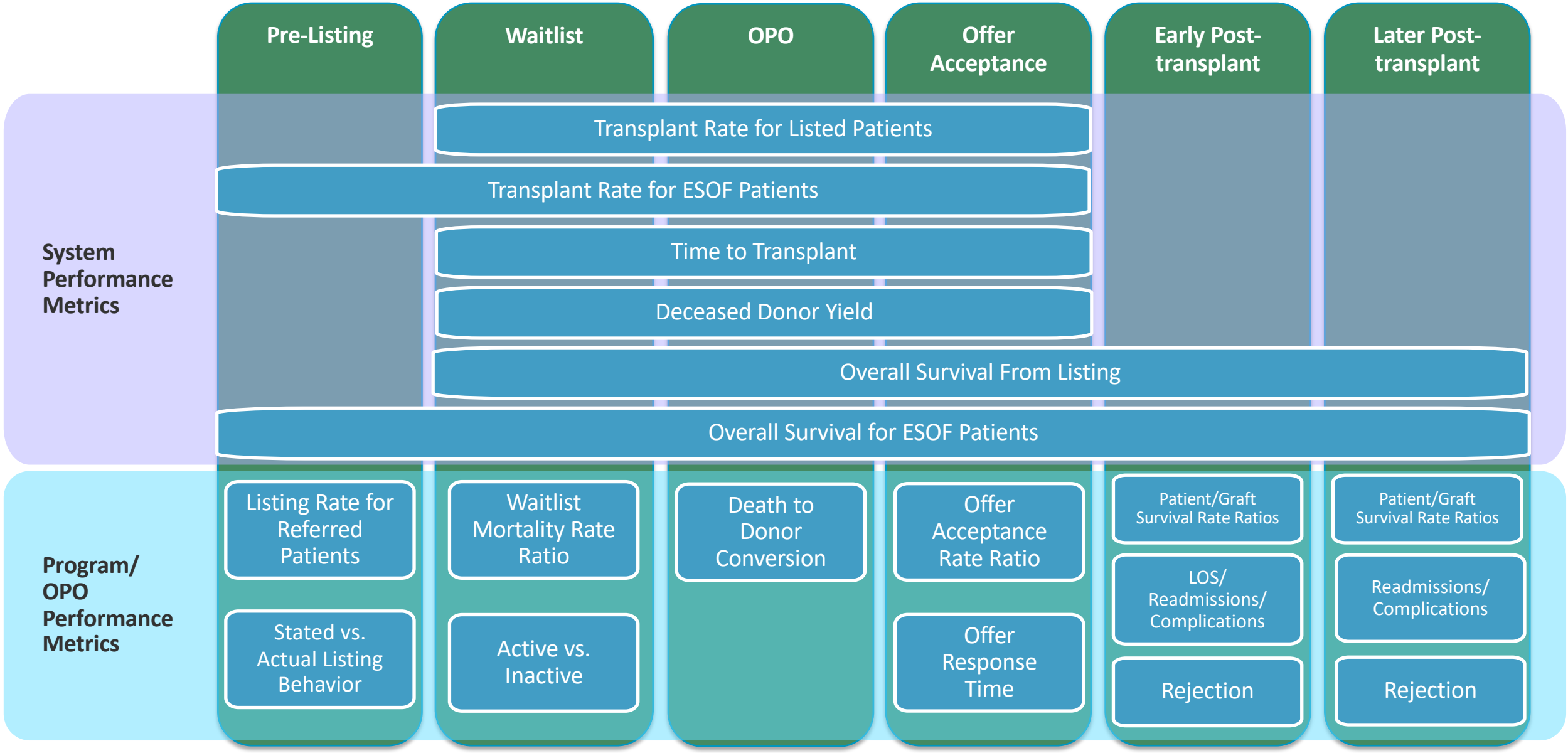
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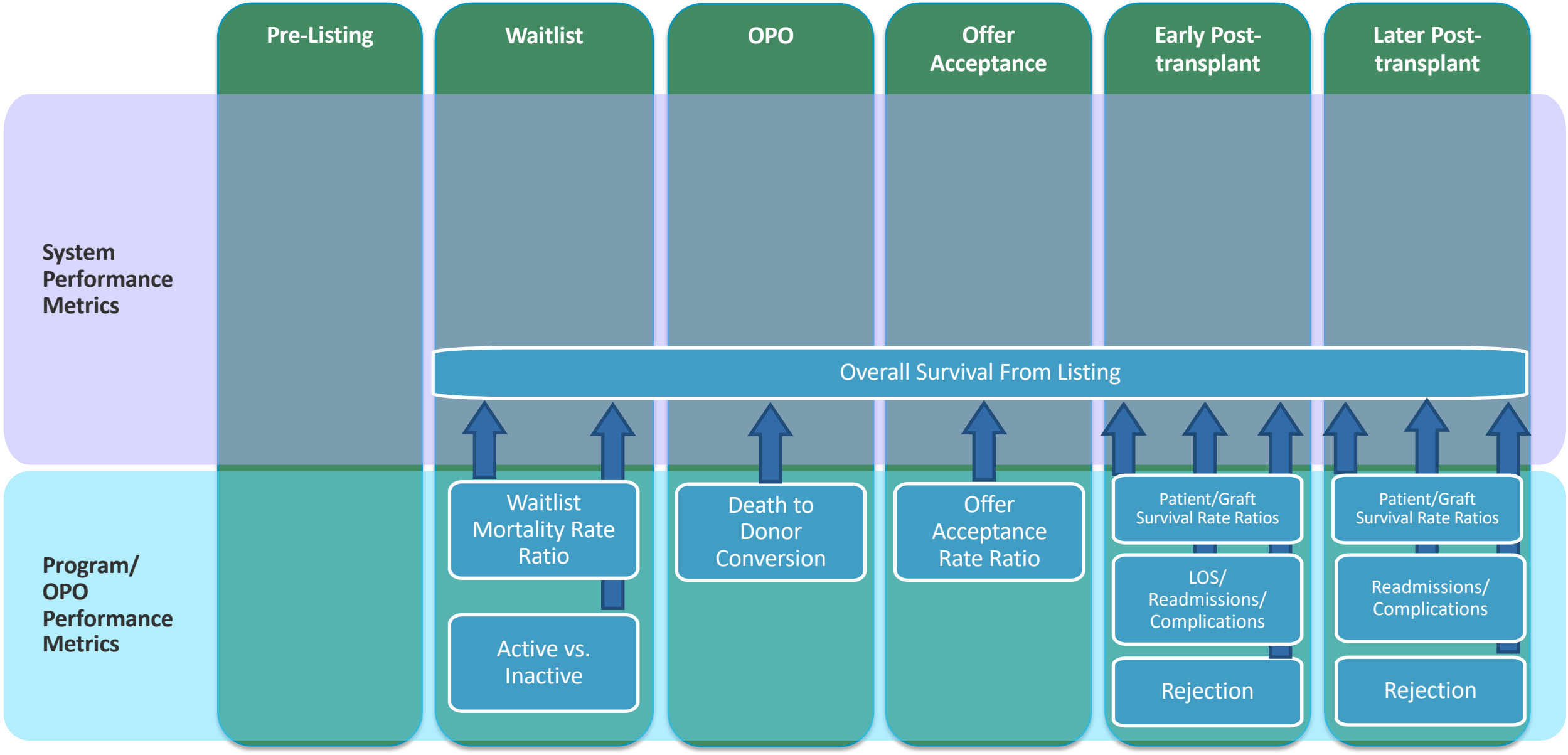
1. Something that is important.
2. Something that is reliably measured.
3. Something for which there is reliable data.
4. Something that the monitored entity can impact.
5. Something that the monitored entity accepts as important.

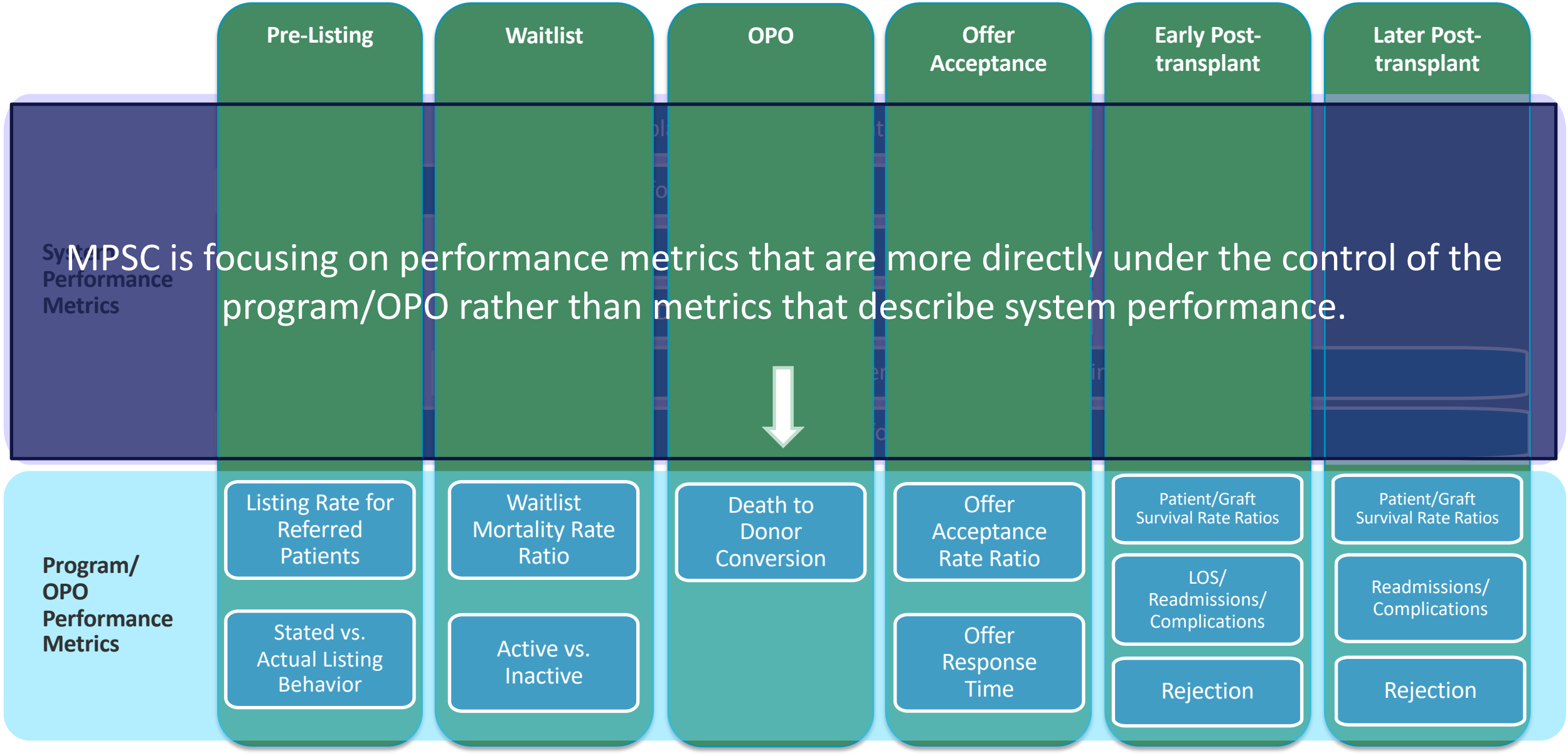
SCIENTIFIC REGISTRY OF TRANSPLANT RECIPIENTS

Metrics Overview

Jon Snyder, PhD
Director, Scientific Registry of Transplant Recipients
Director, Transplant Epidemiology
Chronic Disease Research Group
Hennepin Healthcare Research Institute


Pre-Listing
Waitlist
OPO
Offer Acceptance
Early Post-transplant
Later Post-transplant
System Performance Metrics
Transplant Rate for Listed Patients
Transplant Rate for ESOF Patients
Time to Transplant
Deceased Donor Yield
Overall Survival From Listing
Overall Survival for ESOF Patients
Program/ OPO Performance Metrics
Listing Rate for Referred Patients
Stated vs. Actual Listing Behavior
Waitlist Mortality Rate Ratio
Active vs. Inactive
Death to Donor Conversion
Offer Acceptance Rate Ratio
Offer Response Time
Patient/Graft Survival Rate Ratios
LOS/ Readmissions/ Complications
Rejection
Patient/Graft Survival Rate Ratios
Readmissions/ Complications
Rejection


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Rejection


Pre-Listing
Waitlist
OPO
Offer Acceptance
Early Post-transplant
Later Post-transplant
System Performance Metrics
MPSC is focusing on performance metrics that are more directly under the control of the program/OPO rather than metrics that describe system performance.
Program/ OPO Performance Metrics
Listing Rate for Referred Patients
Stated vs. Actual Listing Behavior
Waitlist Mortality Rate Ratio
Active vs. Inactive
Death to Donor Conversion
Offer Acceptance Rate Ratio
Offer Response Time
Patient/Graft Survival Rate Ratios
LOS/ Readmissions/ Complications
Rejection
Patient/Graft Survival Rate Ratios
Readmissions/ Complications
Rejection

MPSC has chosen these four as the proposed metrics to assess holistic transplant program performance.

All are risk-adjusted “rate ratios”… that is, they compare observed to expected performance.

	Pre-Listing	Waitlist	OPO	Offer Acceptance	Early Post-transplant	Later Post-transplant
System Performance Metrics						
Program/ OPO Performance Metrics	Listing Rate for Referred Patients Stated vs. Actual Listing Behavior	Waitlist Mortality Rate Ratio Active vs. Inactive	Death to Donor Conversion	Offer Acceptance Rate Ratio Offer Response Time	90 day Graft Survival Rate Ratios LOS/ Readmissions/ Complications Rejection	Day 90 365 Graft Survival Rate Ratios Readmissions/ Complications Rejection

Let’s Look at each metric…

Pretransplant Metrics

Posttransplant Metrics

- Pre-transplant (waitlist) mortality rate ratio
- Offer acceptance rate ratio
- 90-day graft failure rate ratio
- Conditional 1-year graft failure rate ratio

SCIENTIFIC REGISTRY OF TRANSPLANT RECIPIENTS

Pretransplant (waitlist) Mortality Rate Ratio

Pretransplant (Waitlist) Mortality



Question Being Addressed:

On days when a patient is not transplanted, are patients listed by this program more/less likely to die compared with similar patients nationally?

Pretransplant (Waitlist) Mortality Rate Ratio: Methodology

Compares Observed (O) deaths to expected (E) deaths from the time the patient is listed until they are transplanted.

O = Observed Deaths Between Listing and Transplant.

E = Expected Deaths Between Listing and Transplant.

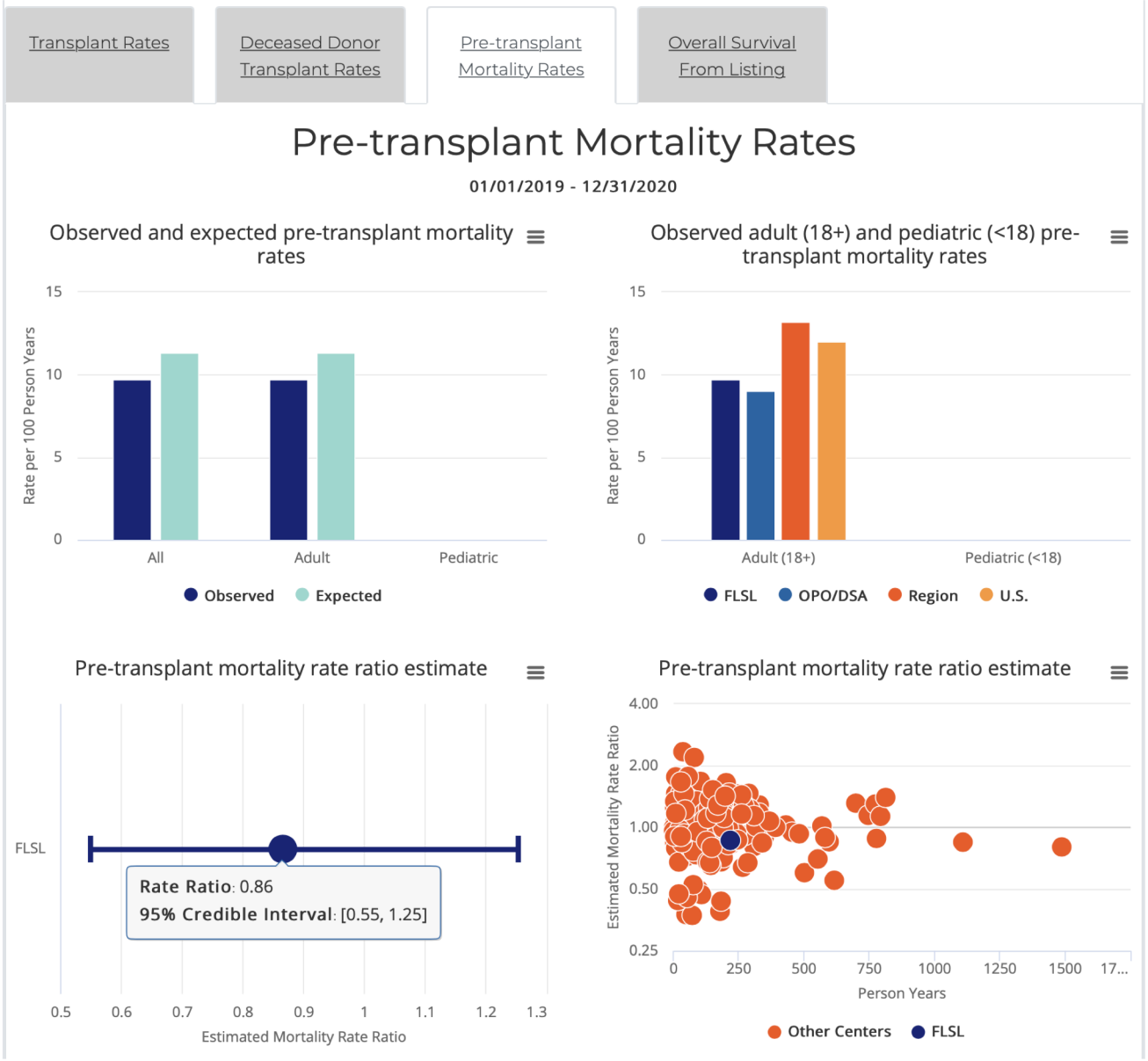
Waitlist Mortality Rate Ratio = (O+2)/(E+2).

Pretransplant (Waitlist) Mortality Rate Ratio: Methodology

Evaluation Window	2-year evaluation window
Days evaluated	Any day within the window from waitlisting until transplant.
Post-removal deaths	Deaths are evaluated post-removal unless transferred to another program. If a person is removed for reason of recovery (transplant no longer needed), deaths are evaluated for a maximum of 60 additional days.

SRTR Reporting

Pre-transplant mortality rates are reported with detail by adult and pediatric candidates (if applicable) and comparisons to outcomes within the donation service area (DSA), the OPTN region, and comparisons to all other programs.



Pretransplant Workbooks are Available to Perform Subgroup Analyses

Available on the SRTR Secure Site.

Programs can view evaluations within subgroups of choice. Example shown at right is by candidate age groups

Overall Waitlist Mortality Rate	
All candidates	
Number of Candidates	145
Observed Deaths (O)	9
Expected Deaths (E)	5.96
Overall Waitlist Mortality Rate Ratio	1.38
Candidate age: <40	
Number of Candidates	43
Observed Deaths (O)	2
Expected Deaths (E)	0.94
Overall Waitlist Mortality Rate Ratio	1.36
Candidate age: 40-<60	
Number of Candidates	46
Observed Deaths (O)	4
Expected Deaths (E)	2.01
Overall Waitlist Mortality Rate Ratio	1.5
Candidate age: ≥60	
Number of Candidates	55
Observed Deaths (O)	3
Expected Deaths (E)	3.01
Overall Waitlist Mortality Rate Ratio	1

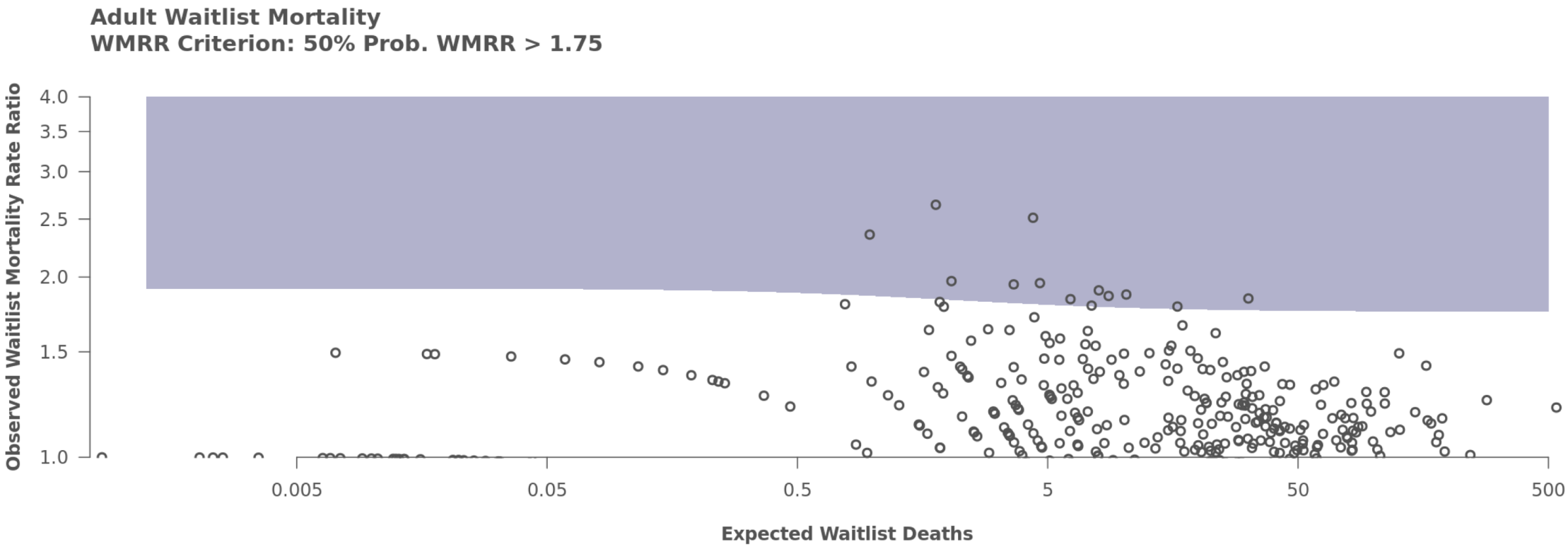
MPSC Screening Rule

A program will be reviewed for its waitlist mortality rate ratio if:

The probability is >50% that the program's waitlist mortality rate ratio is >1.75.

In other words, there is more than 50% probability that the program's mortality rate is at least 75% higher than expected.

MPSC's Screening Rule Visualized



Q: Does monitoring waitlist mortality disincentive listing of “risky” patients?

Intuitively, avoiding higher risk listings will lower the waitlist mortality rate.

However, SRTR compares **observed deaths to expected deaths** after adjusting for various patient characteristics.

For example, kidney waitlist mortality is adjusted for candidate age, blood type, BMI, diabetes, education level, employment status, sex, height, weight, history of malignancy, PVD, insurance coverage, race, albumin, cPRA, primary diagnosis, years since ESRD certification, time on the waitlist, history of transplant, and multi-organ candidacy.

SCIENTIFIC REGISTRY OF TRANSPLANT RECIPIENTS

FIND & COMPARE TRANSPLANT PROGRAMS

Select Organ | Search by Postal Code or Program Name (optional) | SEARCH

ABOUT SRTR | ABOUT THE DATA | REPORTS | TOOLS | NEWS & MEDIA | REQUESTING SRTR DATA | FAQS | CONTACT US

- Risk Adjustment Models
  - Posttransplant Outcomes
  - Waiting List
  - Offer Acceptance
  - Deceased Donor Yield
  - Mortality After Listing
- Kidney Transplant Decision Aid
- Liver Waiting List Calculator
- Acuity Circles Evaluation
- COVID-19 Evaluation

COV App

Includes a wide otive statistics.

COVID-19 APP

SRTR Risk Adjustment Model Documentation: Waiting List Models

Choose a PSR Release Date:

July 2021

Organ

- (•) Kidney
- ( ) Liver
- ( ) Heart
- ( ) Lung
- ( ) Pancreas
- ( ) Intestine
- ( ) Simultaneous Heart-Lung

Outcome

- ( ) Transplant Rate
- ( ) Deceased Donor Transplant Rate
- (•) Pre-transplant Mortality Rate*

Choose an age group:

- ( ) Pediatric (<18)
- (•) Adult (18+)

Model Elements | Model Coefficients | Model Element Plots | Baseline Hazard | Additional Info

Model Elements Table

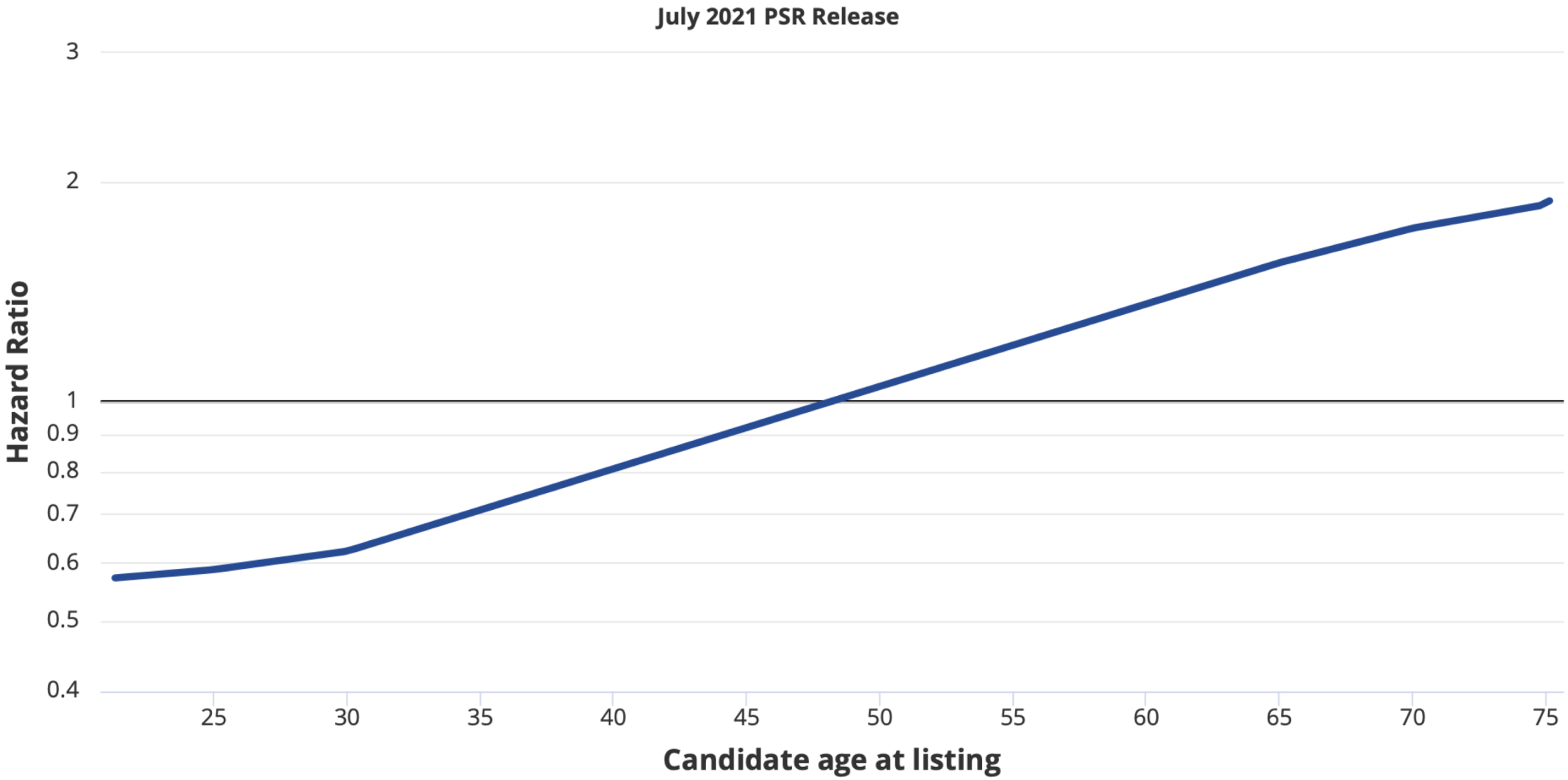
This table lists the elements included in the risk adjustment model and each element's data source. For additional information on the data sources, click the Additional Info tab.

Show 25 entries

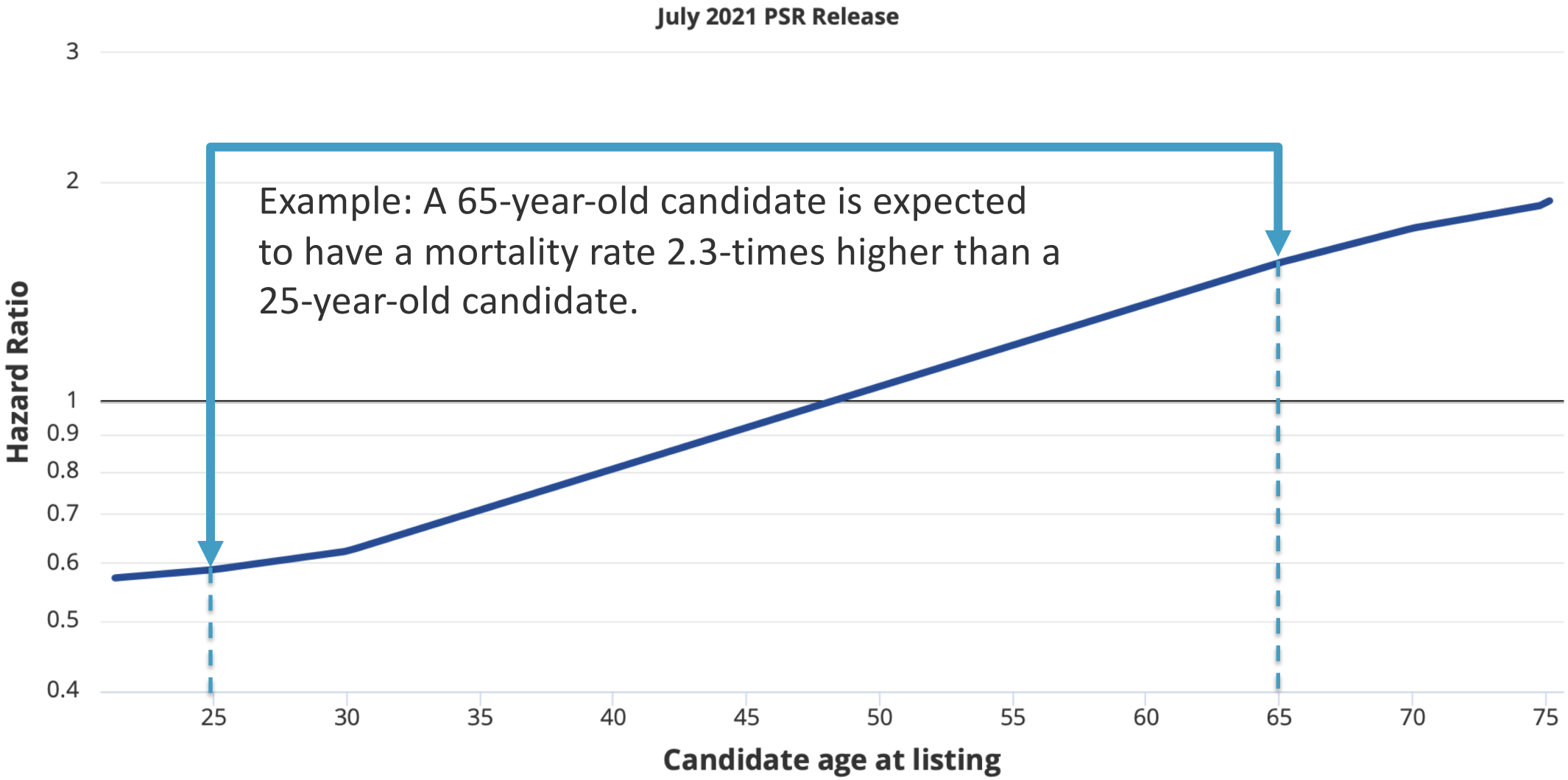
Search:

Element	Source
Candidate age at listing	TCR
Candidate blood type	TCR
Candidate BMI	Calculated
Candidate diabetes type	TCR
Candidate education	TCR
Candidate sex	TCR
Candidate height	TCR
Candidate previous malignancy	TCR
Candidate PVD	TCR
[illegible]	TCR

Adult (18+) Kidney Pre-transplant Mortality Rate*



Adult (18+) Kidney Pre-transplant Mortality Rate*



Q: Can I improve my waitlist mortality rate by transplanting patients faster?

Intuitively, programs with high transplant rates are more likely to transplant their candidates before they die on the waiting list.

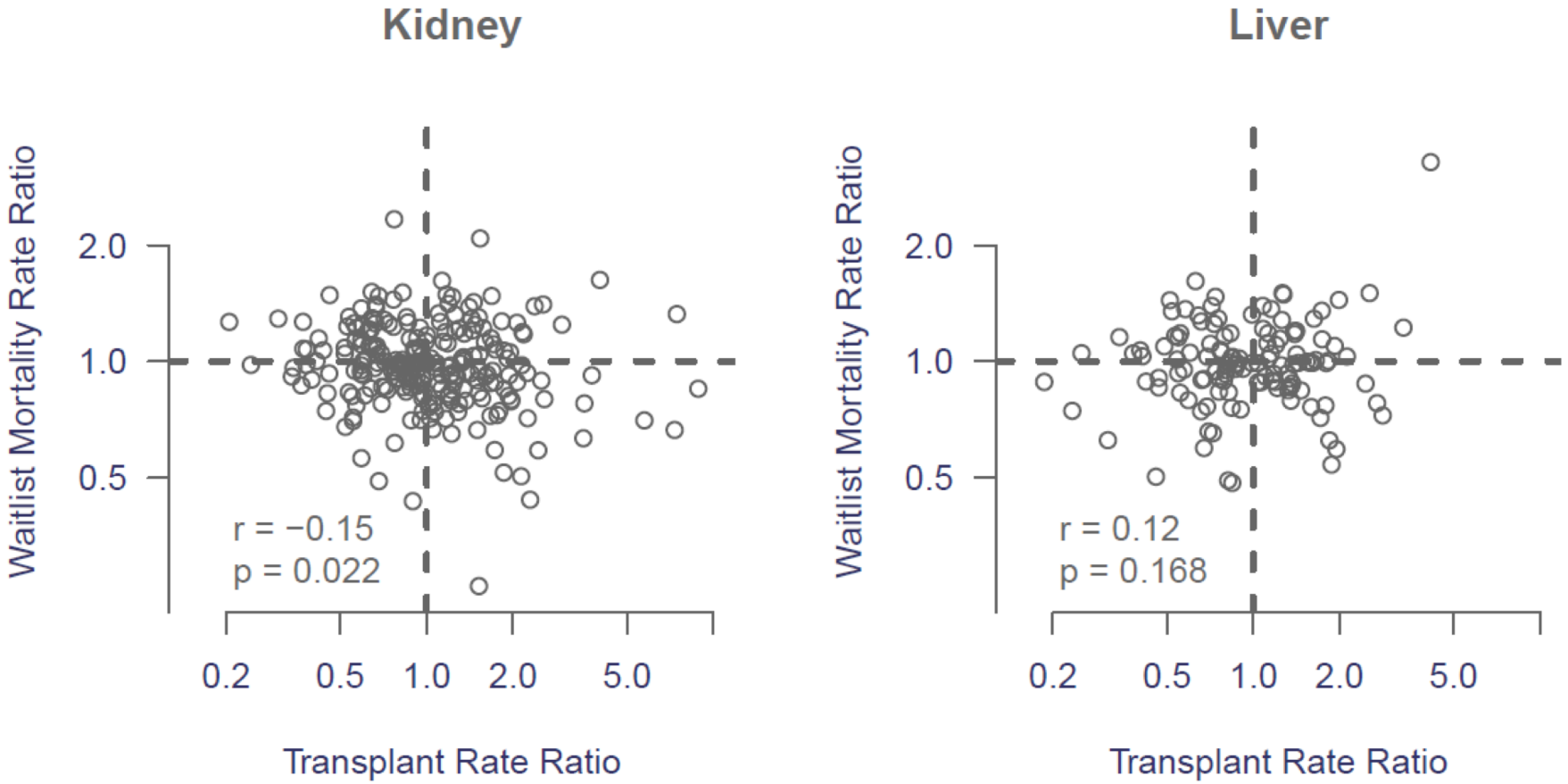
Waitlist mortality rate measures the risk of dying on given day if the patient is not transplanted on that day.

There is no mathematical reason for a program with a high transplant rate to have a low waitlist mortality rate.

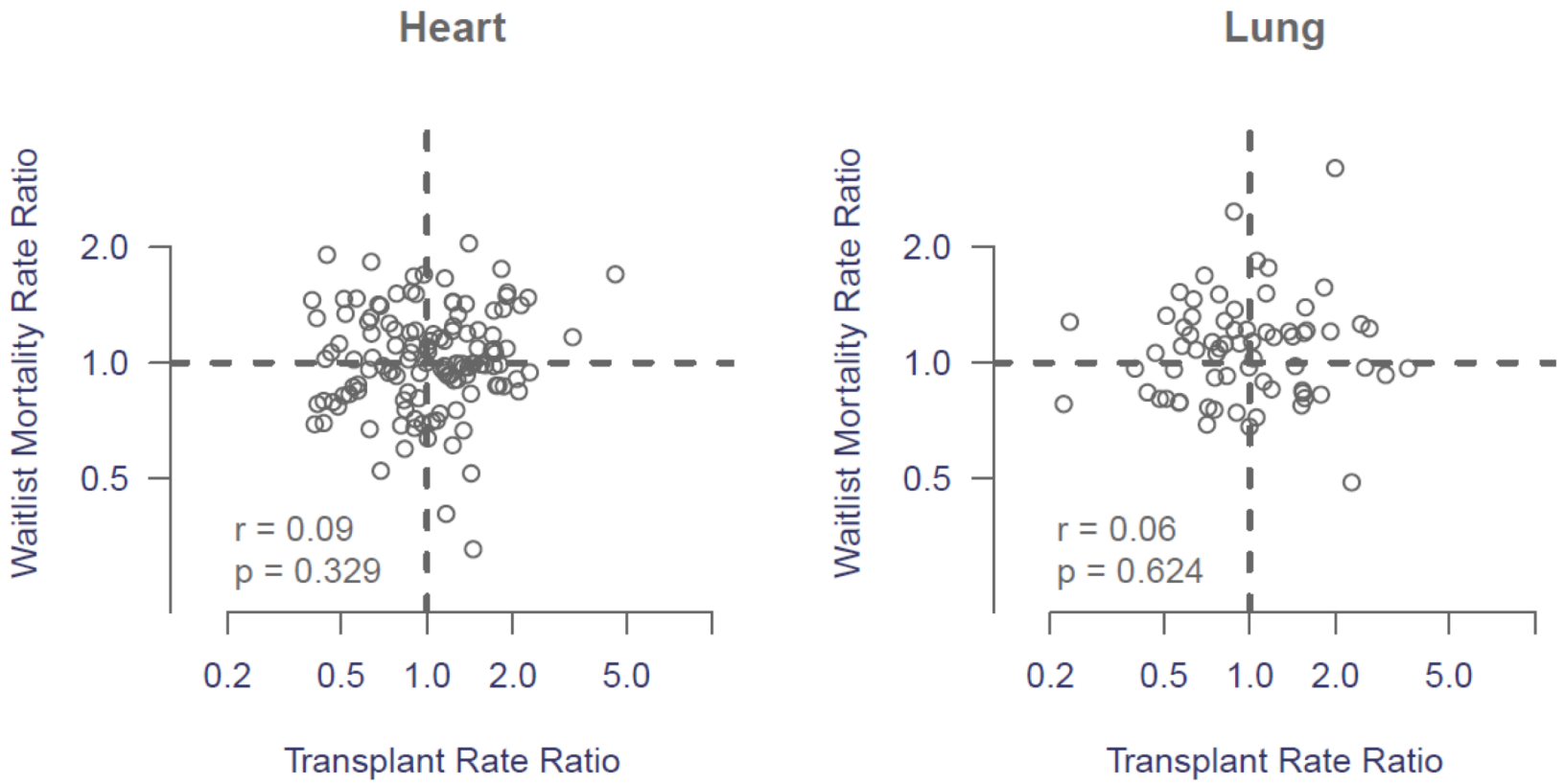
High transplant rates **can result in lower numbers of total deaths before transplant**, but this is not what the waitlist mortality rate is measuring.

Wey et al., "Program-specific transplant rate ratios: Association with allocation priority at listing and posttransplant outcomes," *American Journal of Transplantation*, 2018.

Q: Can I improve my waitlist mortality rate by transplanting patients faster?



Q: Can I improve my waitlist mortality rate by transplanting patients faster?



Q: Can I improve my waitlist mortality rate by transplanting patients faster?

Conclusion:

Risk-adjusted transplant and waitlist mortality rate ratios are not mathematically associated with each other. Therefore, they measure different processes of care, and it is possible to have good outcomes for both.

SCIENTIFIC REGISTRY OF TRANSPLANT RECIPIENTS

Offer Acceptance Rate Ratio

Offer Acceptance Rate Ratio



Question Being Addressed:

Given the types of offers received to the specific candidates, does this program accept offers at a rate higher/lower than national experience for similar offers to similar candidates?

Offer Acceptance Rate Ratio: Methodology

Compares Observed (O) offer acceptances to expected (E) offer acceptances.

O = Observed Offer Acceptances

E = Expected Offer Acceptances

Offer Acceptance Rate Ratio = (O+2)/(E+2).

Offer Acceptance Rate Ratio: Methodology

Evaluation Window	1-year evaluation window
Offers that are NOT evaluated	1. Bypassed offers 2. Match run had no acceptances 3. Offer occurred after the organ was accepted* 4. Duplicate offers across multiple match runs** 5. Offers to multi-organ candidates***
Notes	*Kidney offers declined under the Kidney Accelerated Placement Program may be included after the last acceptance if normal allocation restarted. **Kidney allocation may offer candidates dual kidneys after the single kidney. In this situation, the second offer to the candidates is kept in the cohort. ***Kidney-alone offers are include for KP candidates if the program indicated the patient will entertain kidney-alone offers.

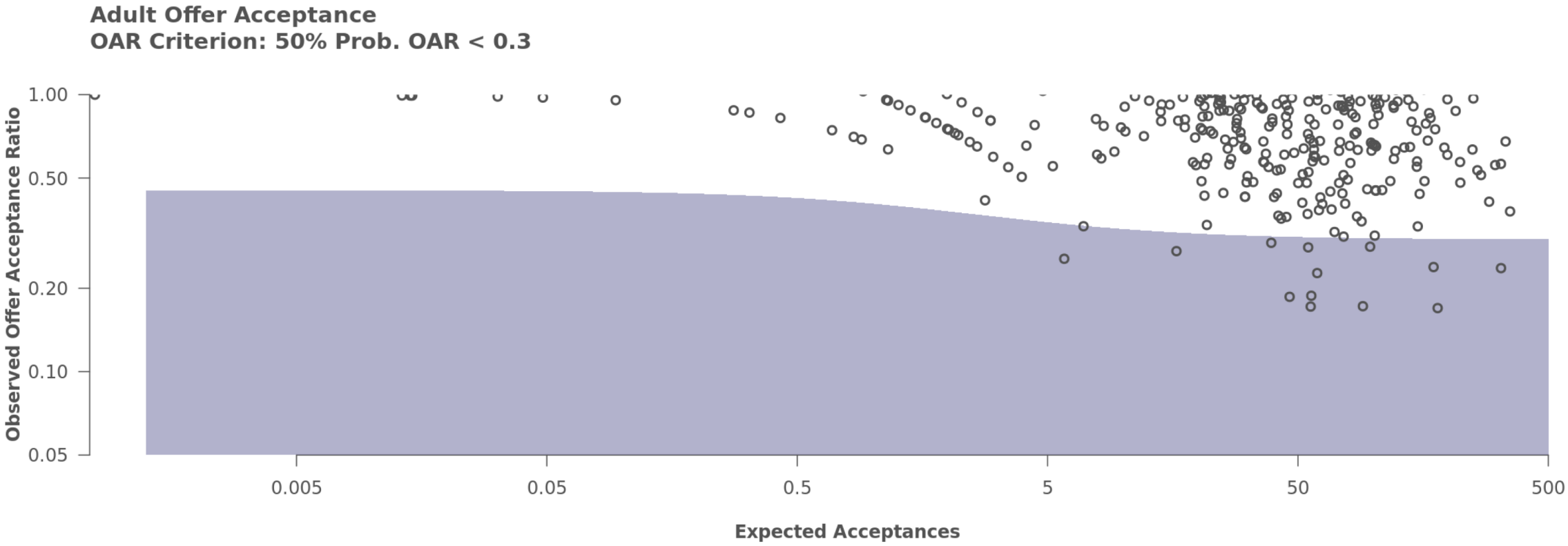
MPSC Screening Rule

A program will be reviewed for its offer acceptance rate ratio if:

The probability is >50% that the program's offer acceptance rate ratio is <0.30.

In other words, there is more than 50% probability that the program's offer acceptance rate is at least 70% lower than expected.

MPSC's Screening Rule Visualized



SCIENTIFIC REGISTRY OF TRANSPLANT RECIPIENTS

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COV App

Includes a wide otive statistics.

COVID-19 APP

SRTR Risk Adjustment Model Documentation: Offer Acceptance Models

Choose an organ of interest:

- (•) Kidney
- ( ) Liver
- ( ) Heart
- ( ) Lung
- ( ) Pancreas

Kidney Model Strata

- ( ) Pediatric
- ( ) Adult: KDRI < 1.05
- (•) Adult: 1.05 < KDRI < 1.75
- ( ) Adult: KDRI > 1.75

Model Elements | **Model Element Plots** | **Model Fitting Process** | **Additional Info**

Q: Can I Improve my Offer Acceptance Ratio by Filtering Offers, but ultimately harming my candidates?

There is a perception that limiting offers to those a program will accept may improve the offer acceptance ratio while ultimately harming the patient by limiting their access to transplant.

Q: Can I Improve my Offer Acceptance Ratio by Filtering Offers?

- Offer acceptance rate ratios are adjusted for many donor and candidate factors.
    - Adjustment is also made for logistical issues like **offer number** and **distance from the recipient**.

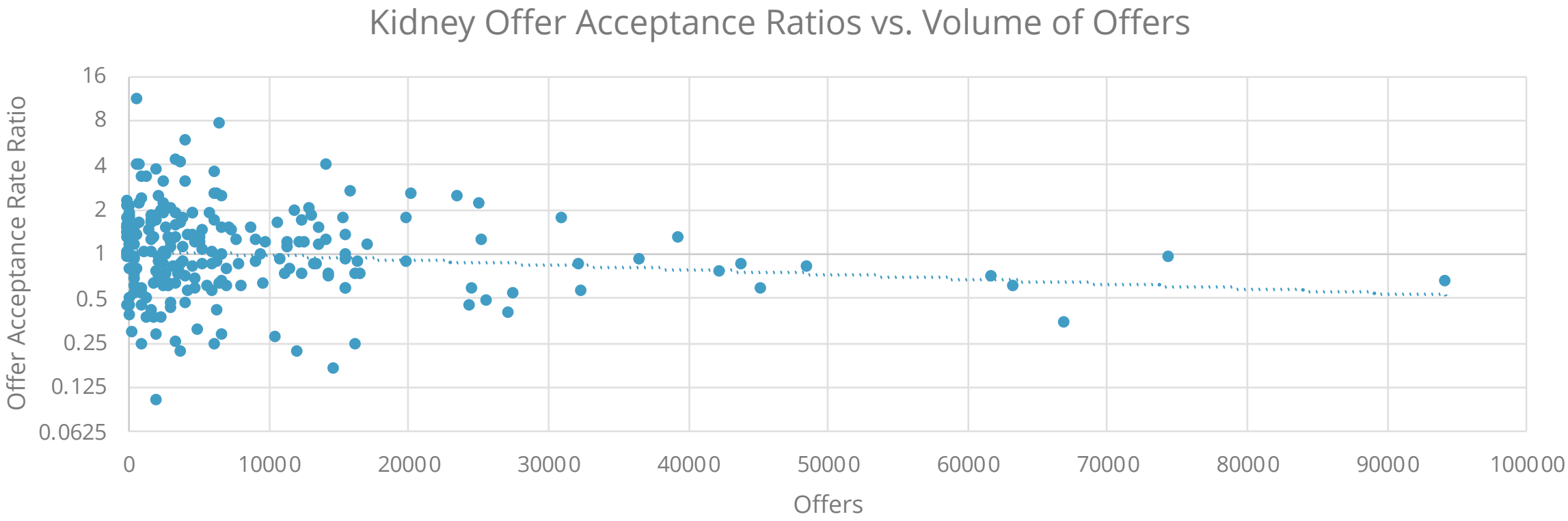
- Offers you are very likely to accept are offers all programs are very likely to accept. Filtering offers can potentially raise a poor offer acceptance evaluation to average, but not necessarily better than average.

- In addition, filtering offers the program is very unlikely to accept has the potential to speed up the allocation process, thereby benefiting all patients.

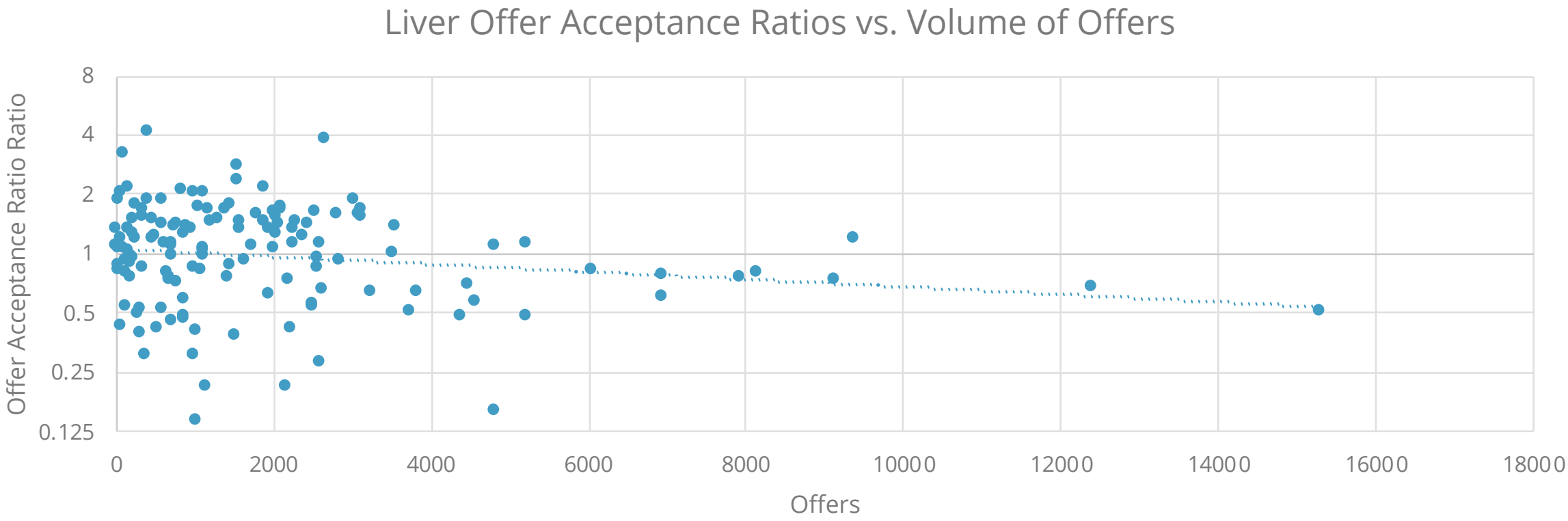
Q: Do larger programs have an advantage for the offer acceptance evaluations?

There is a perception that larger programs will have better offer acceptance evaluations because they have more chances to accept the organ for someone on their list.

Q: Do larger programs have an advantage for the offer acceptance evaluations?



Q: Do larger programs have an advantage for the offer acceptance evaluations?



Q: Do larger programs have an advantage for the offer acceptance evaluations?

Programs with larger lists do not have systematically better offer acceptance evaluations.

SRTR recommends “offer” acceptance ratios over “organ” acceptance ratios, which are biased in favor of larger programs.

SCIENTIFIC REGISTRY OF TRANSPLANT RECIPIENTS

90-day and Conditional 1-Year Graft Survival

90-Day and Conditional 1-Year Graft Survival



Conditional 1-year: Conditional on graft survival to day 90, evaluates graft survival from day 90 to 1-year.

Graft Failure Rate Ratio



Question Being Addressed:

Given the types of recipients and the types of donors transplanted, is the failure rate at this program higher/lower than expected based similar transplants nationally?

Graft Failure Rate Ratio: Methodology

Compares Observed (O) graft failures to expected (E) graft failures. Graft failure is defined as the earlier of graft loss or death.

O = Observed Graft Failures

E = Expected Graft Failures

Graft Failure Rate Ratio = (O+2)/(E+2).

Graft Failure Rate Ratio: Methodology

Evaluation Window	2.5-year (30 month) inclusion cohort (transplants occurring within the 30-month period).
Transplants NOT evaluated	1. Multi-organ recipients (KP and HL evaluated separately)
Pancreas	Pancreas Patient Survival will be evaluated until SRTR has enough data following the implementation of the new pancreas graft failure definition.

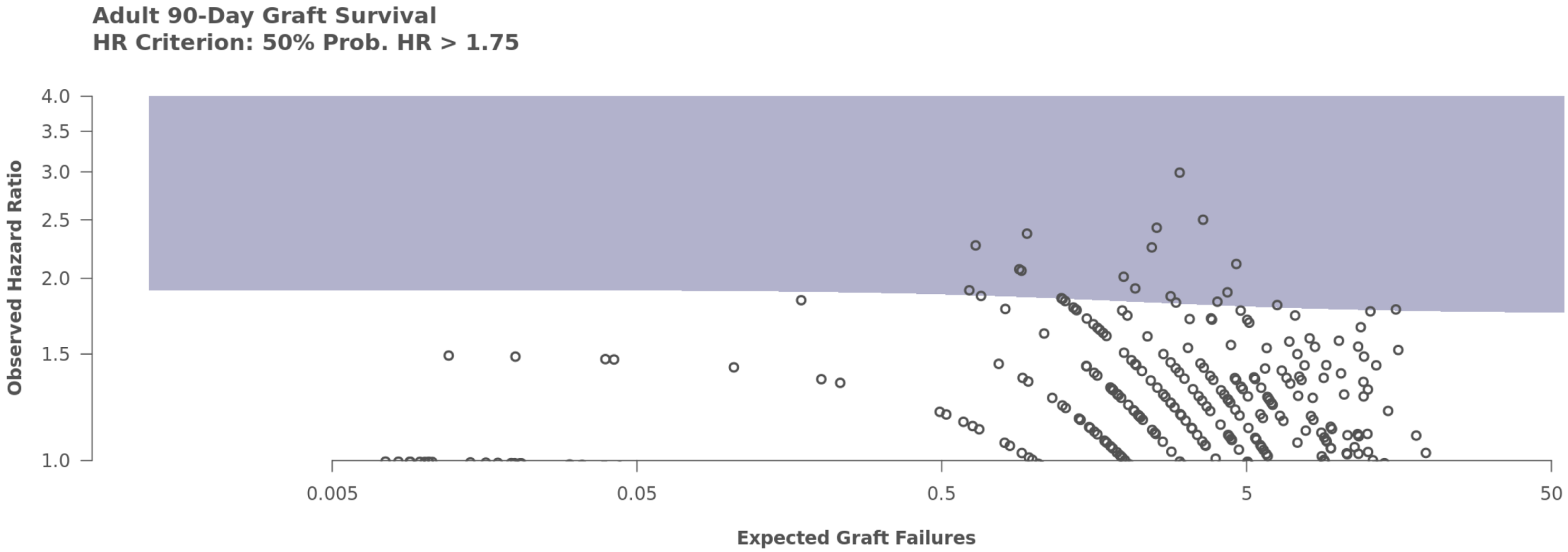
MPSC Screening Rule

A program will be reviewed for its graft failure rate ratio if:

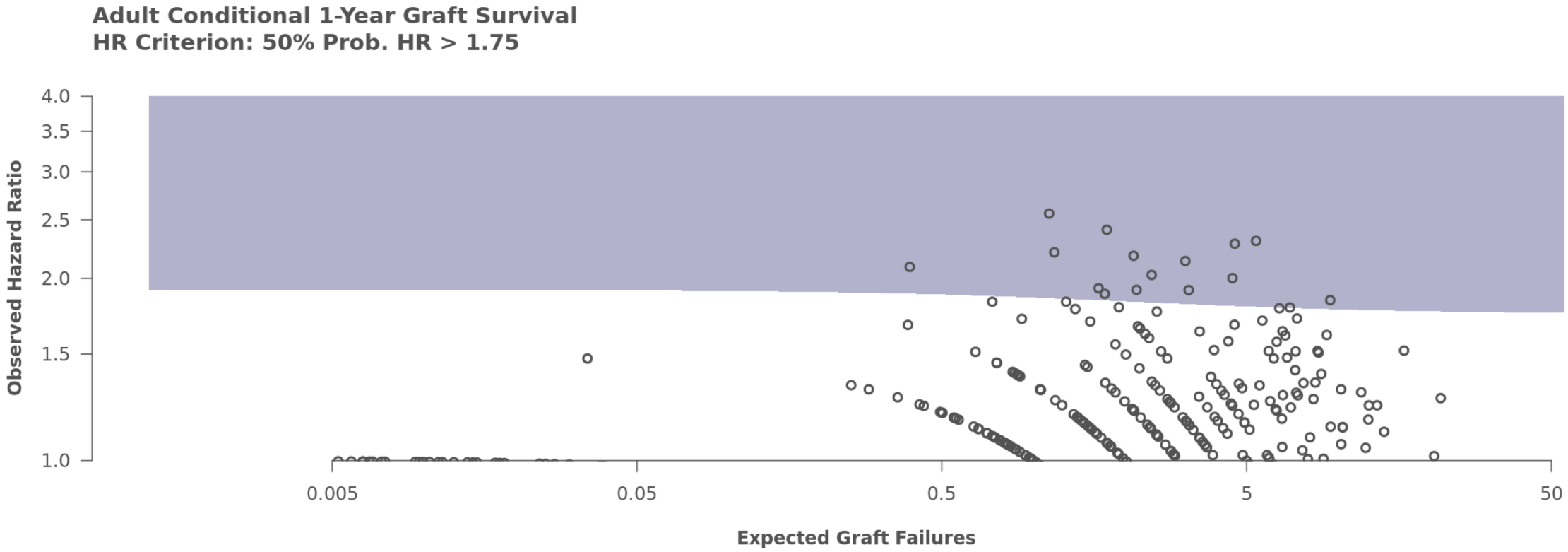
The probability is >50% that the program's graft failure rate ratio is >1.75.

In other words, there is more than 50% probability that the program's graft failure rate is at least 75% higher than expected.

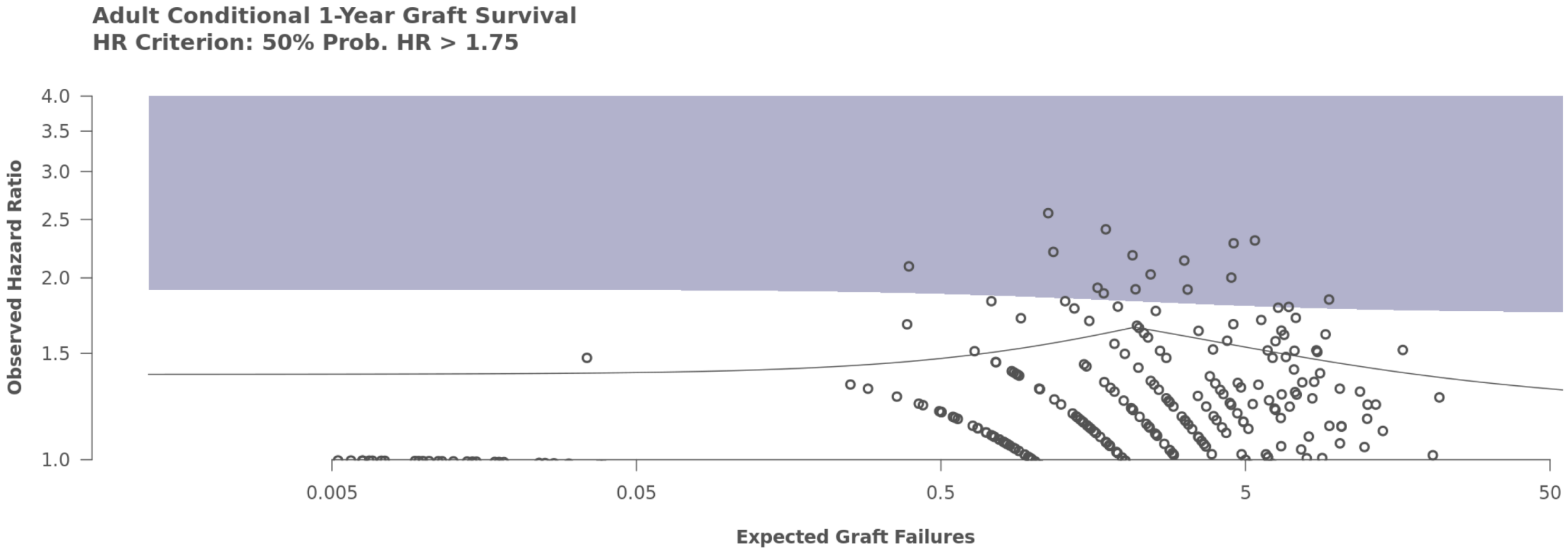
MPSC's Screening Rule Visualized: 90-day



MPSC's Screening Rule Visualized: Conditional 1 Year



MPSC's Screening Rule Visualized: Conditional 1 Year with Current MPSC Criteria



SCIENTIFIC REGISTRY OF TRANSPLANT RECIPIENTS

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COVID-19 APP

SRTR Risk Adjustment Model Documentation: Posttransplant Outcomes

Choose a PSR Release Date:

July 2021

Heart, Intestine, Kidney, Liver, and Lung | **Kidney-Pancreas and Pancreas**

Heart, Intestine, Kidney, Liver, and Lung

Choose a transplant type:

- ○ Heart
- ○ Intestine
- ○ Kidney
- ○ Liver
- ◉ Lung

Choose an outcome:

- ◉ Graft Survival
- ○ Patient Survival

Choose an age group:

- ◉ Adult (18+)
- ○ Pediatric (<18)

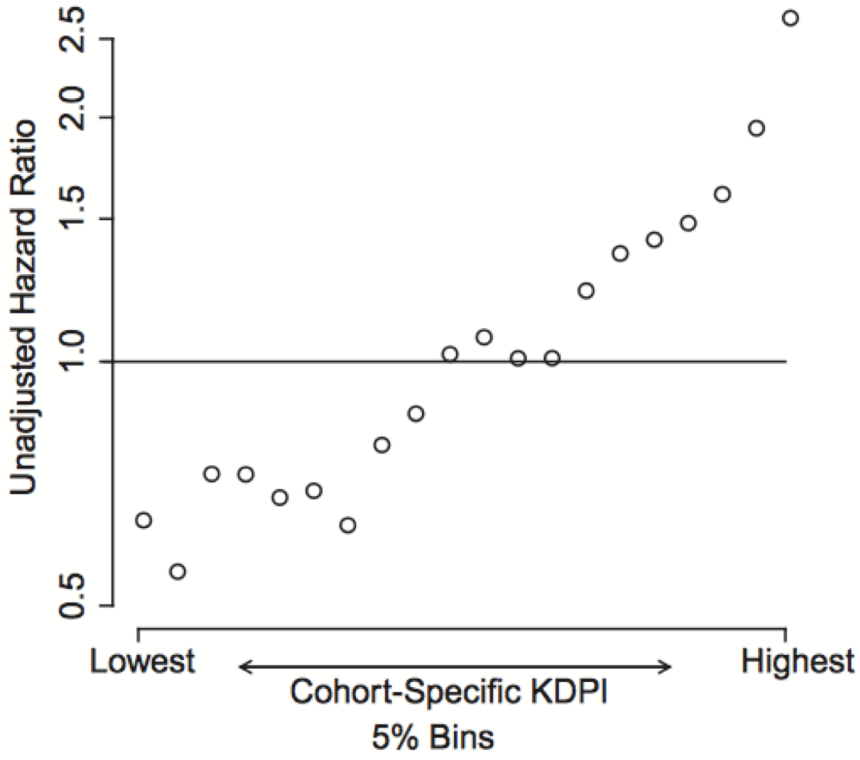
Choose a donor type:

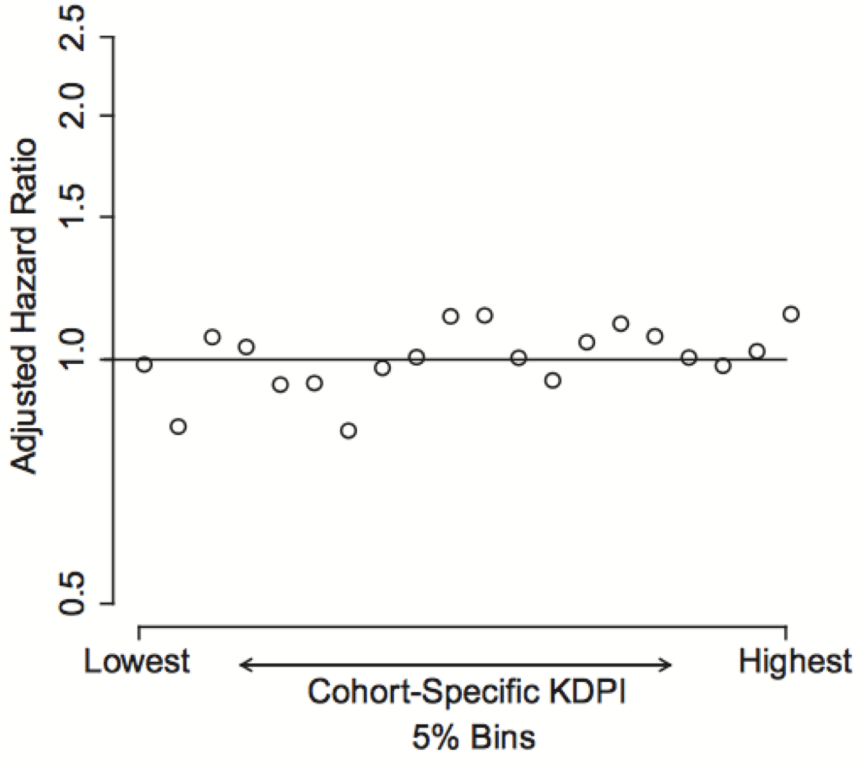
- ◉ Deceased Donor

Choose a time frame:

- ◉ First-Year Outcomes
- ○ Three-Year Outcomes

Q: How well to the models account for measured risk?





Snyder, et al. Effects of High-Risk Kidneys on Scientific Registry of Transplant Recipients Program Quality Reports. Am J Transplant 2016;16:2646-53.

Q: Are a certain percentage of programs flagged for each metric?

Metric	Heart	Kidney	Liver	Lung	Pancreas
Pretranspalnt Mortality Rate Ratio	5	0	3	5	0
Offer Acceptance Rate Ratio	1	6	5	2	2
90-Day Graft Failure Rate Ratio	3	10	4	2	0
Conditional 1-Year Graft Failure Rate Ratio	3	9	1	3	0

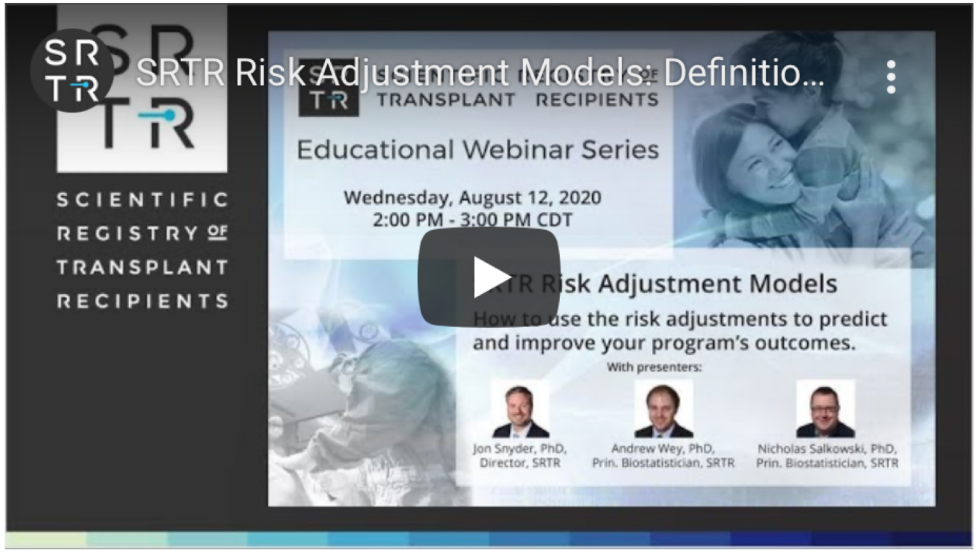
Answer: No. The boundaries were chosen by MPSC to review programs with meaningful deviations from expectation based on national experience. It is not required that a metric will flag any programs, e.g., zero kidney or pancreas programs were flagged for pretransplant mortality rates in the Spring 2020 cycle.

Webinars Available

May 6, 2020



August 12, 2020



https://www.srtr.org/news-media/webinars-and-educational-videos/webinar-items/webinars/

SCIENTIFIC REGISTRY OF TRANSPLANT RECIPIENTS

Thanks to SRTR colleagues supporting MPSC:

Andrew Wey, PhD
Nicholas Salkowski, PhD
Ryutaro Hirose, MD
Bryn Thompson, MPH

Best mode of contact: SRTR@SRTR.org


@SRTRNews

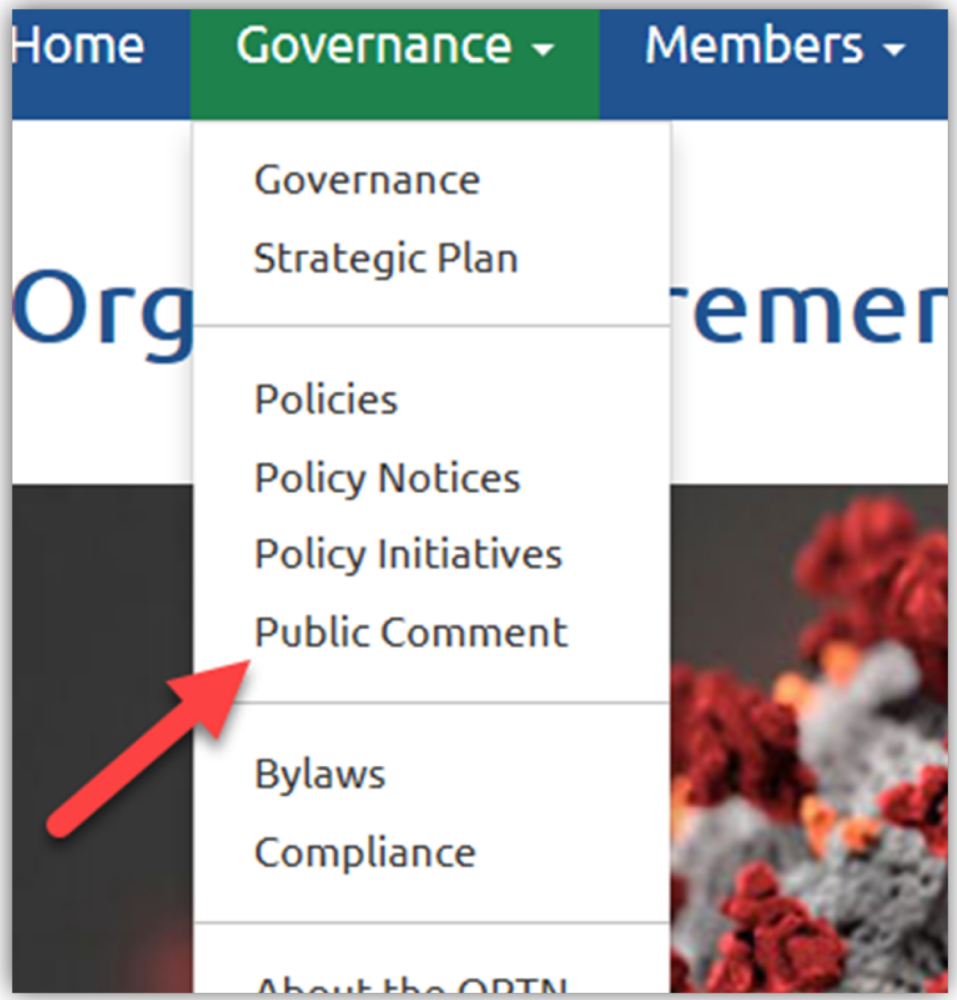

Scientific Registry of Transplant Recipients


SRTR

Provide Feedback

Submit public comments on OPTN website

- August, 3 – September 30, 2021
- http://optn.transplant.hrsa.gov/governance/public-comment/



Regional Meeting Information

- Regional Meetings for the summer 2021 cycle will be a hybrid of in-person and virtual
- We hope the convenience guarantees your participation!
- https://optn.transplant.hrsa.gov/members/regions/



Thank You For Listening!