

# Modify Lung Allocation by Blood Type

*OPTN Lung Transplantation Committee*

# Purpose of Proposal

- Provide more proportional access to lung transplant for candidates of all blood types
- Improve access to lung transplant for blood type O candidates

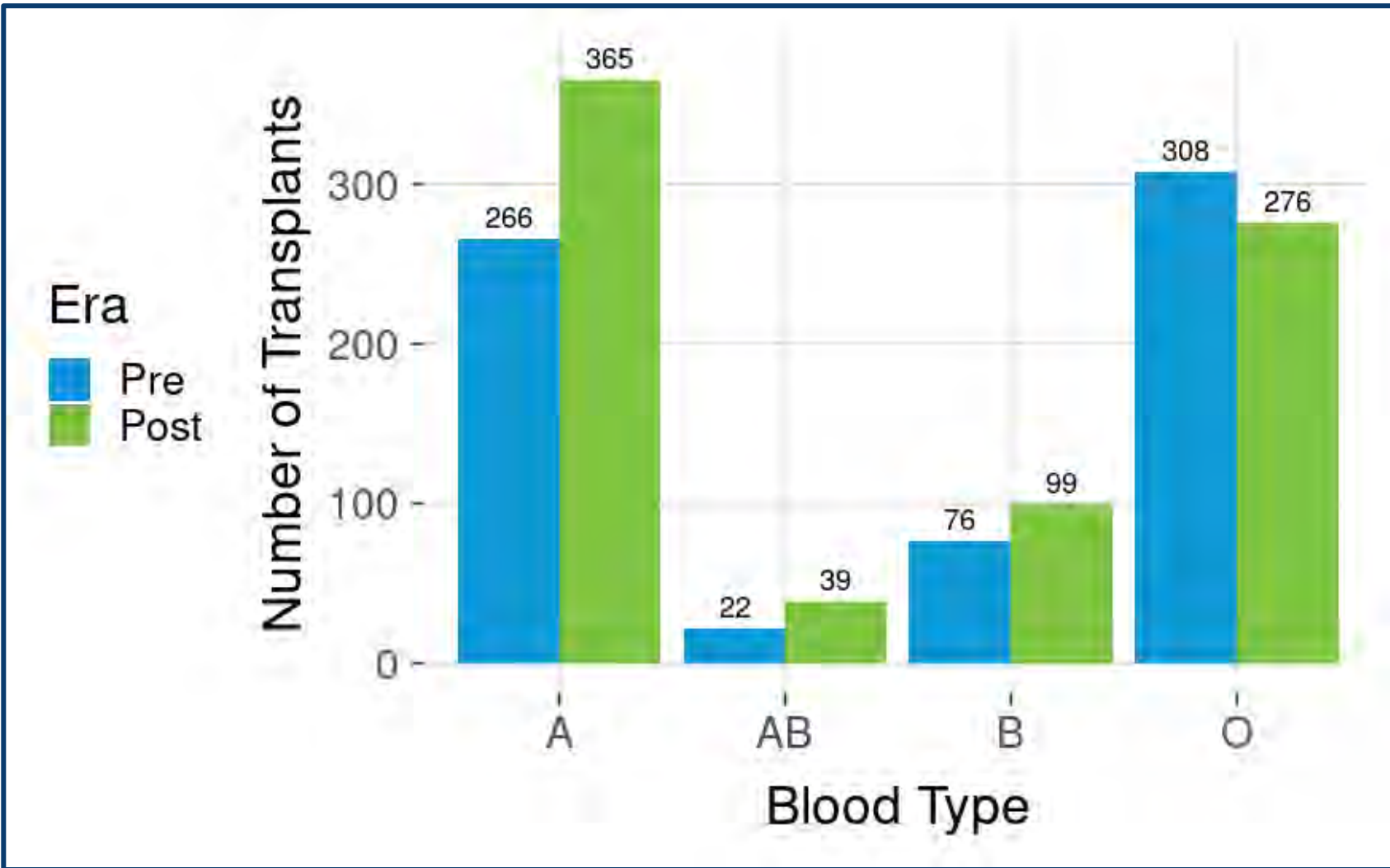
# Proposal

- Scale up the points assigned for blood type so that blood type O receives 5 points
- Adjust points for other blood types proportionally
- Change the shape of the blood type rating scale to have a bigger impact on the allocation score

# Rationale

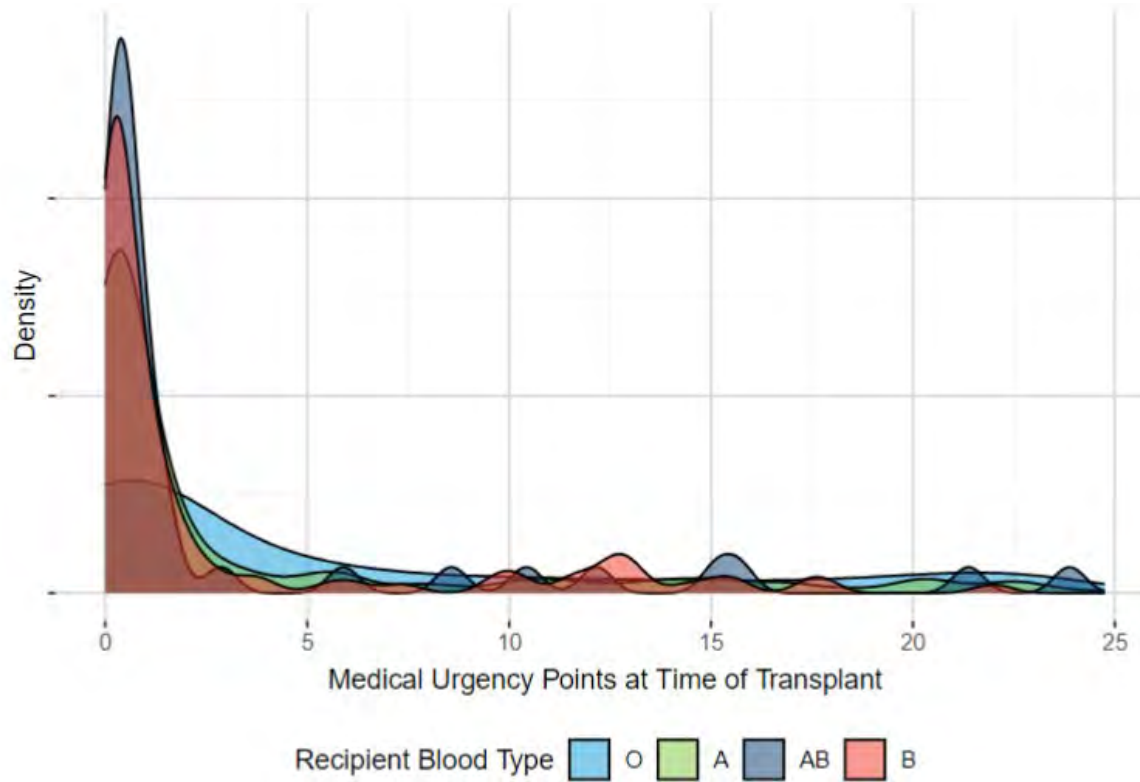
- Blood type O transplants declined following continuous distribution (CD) implementation
- Modeling reviewed during CD policy development suggested blood type O transplants would increase
- Blood type O candidates are waiting longer for transplant and are more medically urgent at transplant
- Proposed rating scale is expected to:
  - Improve transplant rates for blood type O candidates
  - Preserve reductions in waitlist mortality seen in CD relative to the previous allocation system
  - Limit increases in median donor-to-recipient distance relative to current policy

# Blood Type O Transplants Declined Under CD



Blood Type	Pre	Post
A	266 (39.6%)	365 (46.9%)
AB	22 (3.3%)	39 (5.0%)
B	76 (11.3%)	99 (12.7%)
O	308 (45.8%)	276 (35.4%)
Total	672 (100.0%)	779 (100.0%)

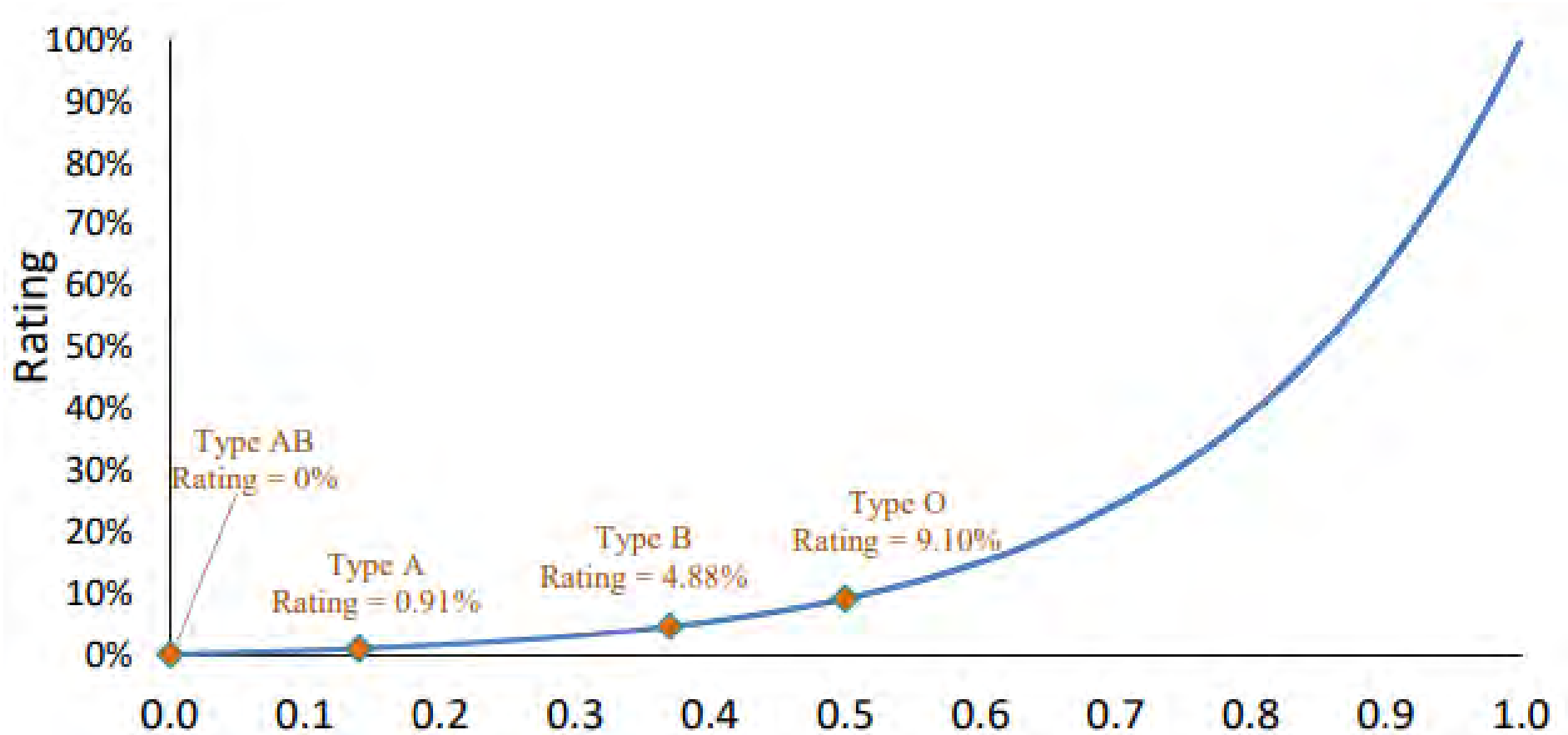
# Medical Urgency Points at Transplant



- Statistically significant difference in medical urgency points by blood type in 3 months post CD
- Kruskal-Wallis,  $p < 0.001$
- O recipients are sicker at the time of transplant

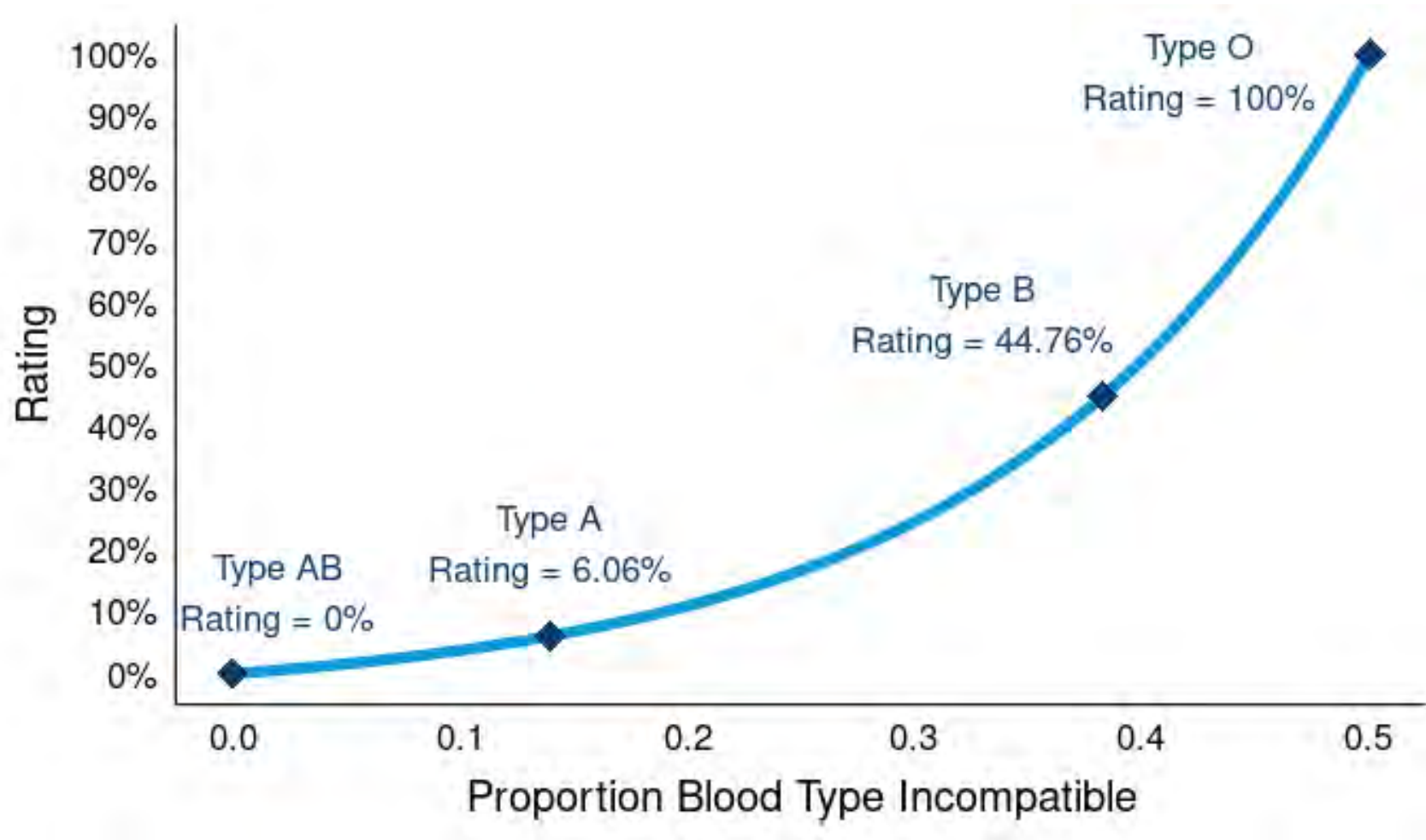
Recipient Blood Type	N Candidates	Min	25th Percentile	Mean	Median	75th Percentile	90th Percentile	Max
O	276	0.0275	0.25750	5.685288	1.2325	9.41500	20.01625	23.2250
A	365	0.0175	0.18000	3.679479	0.5925	3.42250	14.76950	24.7500
AB	39	0.0475	0.26375	3.379039	0.6200	1.46375	12.75850	23.8775
B	99	0.0000	0.18000	2.926818	0.4950	1.94625	12.52750	21.9750

# Current Blood Type Rating Scale and Points



Blood type	Points
O	0.4550
A	0.0455
B	0.2439
AB	0

# Proposed Blood Type Rating Scale and Points



Blood type	Points
O	5.0000
A	0.3032
B	2.2382
AB	0



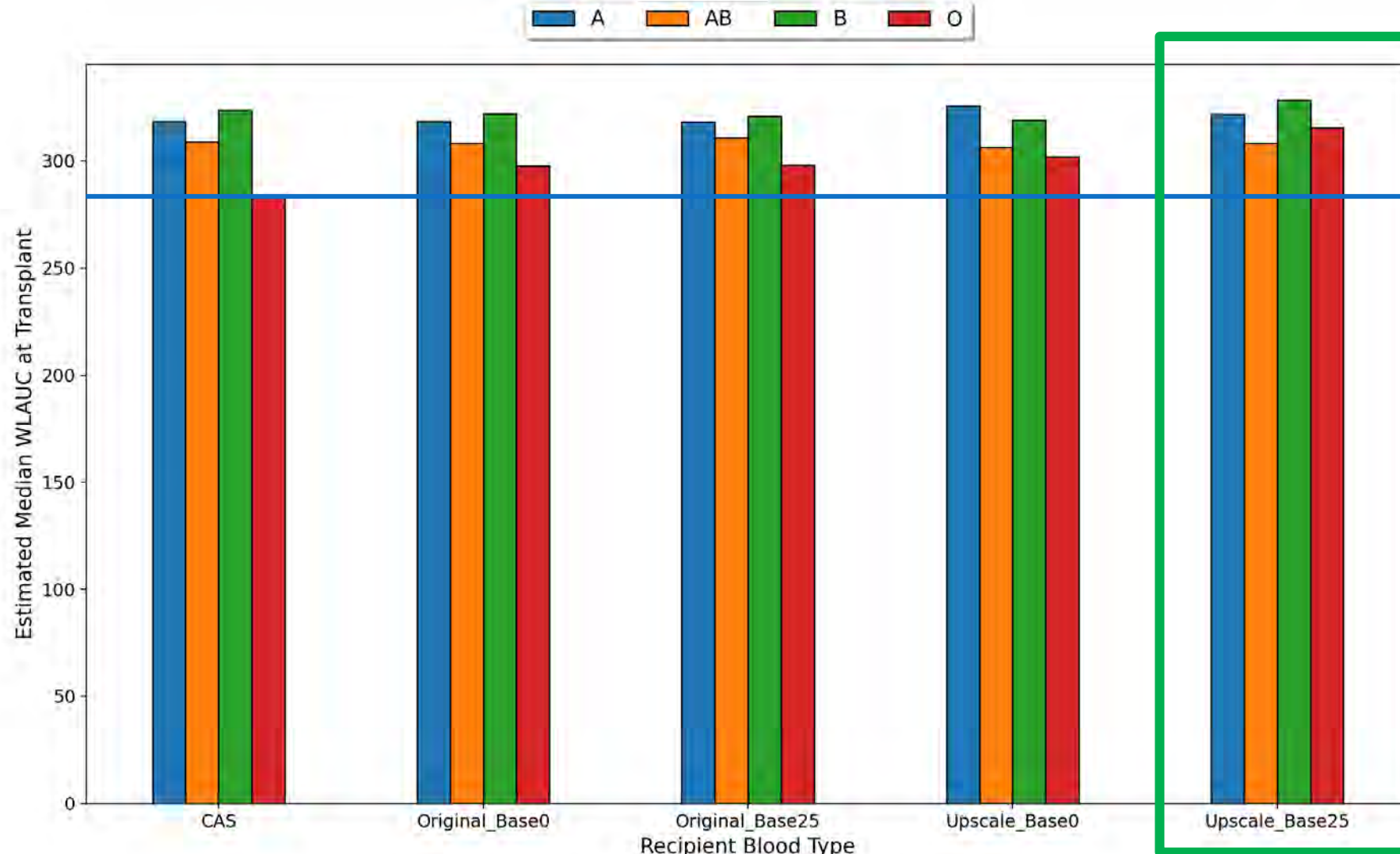
# How the Proposed Points were Determined

- Scaled up the proportion of incompatible donors by dividing by the range of incompatibility so that blood type O achieves a rating of 1.000
  - Blood type O:  $(0.5002)/(0.5002 - 0) = 1.0000$
  - Blood type B:  $(0.3828)/(0.5002 - 0) = 0.7653$
  - Blood type A:  $(0.1396)/(0.5002 - 0) = 0.2791$
  - Blood type AB:  $(0)/(0.5002 - 0) = 0$
- Applied a nonlinear curve using the following equation:
  - $(25^{(\text{upscaled proportion incompatible})} - 1)/24$
- Multiplied these ratings by the 5-point weight assigned to blood type

# Proposed Blood Type Points

Blood type	Rating x Weight =	Points
O	$1.0000 \times 5 =$	5.0000
A	$0.06064 \times 5 =$	0.3032
B	$0.44764 \times 5 =$	2.2382
AB	$0 \times 5 =$	0

# Median Waitlist Survival Days at Transplant



# Options Considered

- Assessed varying the weight on blood type in the overall CAS
  - Keeping the weight at 5% and modifying the rating scale best balances the goals
- Assessed 11 rating scales
  - Used three different approaches to develop rating scale options
    - Identical vs. compatible: Prioritize blood type identical transplants over compatible transplants
    - ABO: Adjust points assigned by blood type by changing the shape of the rating scale and/or scaling up points
    - Ratio: Assign points based on estimate of how many candidates are listed per compatible donor
- Proposed rating scale keeps weight at 5% and follows ABO approach

# Member Actions

- Transplant programs would need to:
  - Update educational materials
  - Review candidates to assess if any approved exceptions should be withdrawn or if new exception requests should be submitted
- Any pending exception requests to the biological disadvantages score at the time of implementation would be withdrawn
  - Pending = exception requests in the system that have not yet been approved or denied
  - Transplant programs would be notified by the OPTN

# What do you think?

- Do you support implementation of the proposed blood type rating scale?
- Would you propose an alternative blood type rating scale?
- Do you support the transition plan for candidates with pending biological disadvantages exception requests?
- What should the Committee consider when monitoring this change?