

# The Impact of Local Heart Allocation On Post-Transplant Survival

Vidang Nguyen, MD<sup>1</sup>, Todd Dardas, MD<sup>2</sup>

<sup>1</sup>Cedars-Sinai Heart Institute, <sup>2</sup>University of Washington

ISHLT 2020

The authors have no financial disclosures

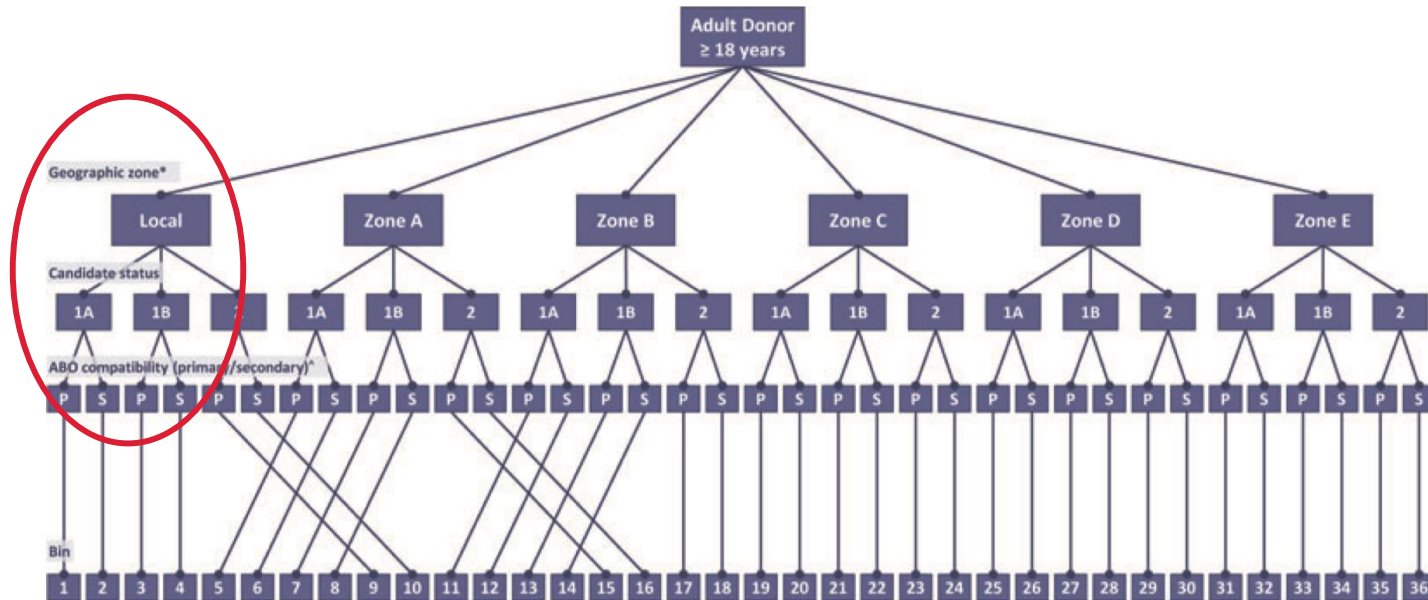
# Introduction

The Organ Procurement and Transplant Network (OPTN) regulates organ allocation to ensure just and equal distribution of donors hears.

The Final Rule States:

*“Allocation should not be based on the candidate’s place of residence or place of listing except to the extent required by sound medical judgment, achieving the best use of donated organs, preserving the ability of transplant programs to decline an organ, and avoiding the waste of organs”*

# Donor service areas (DSAs) have received preferential allocation



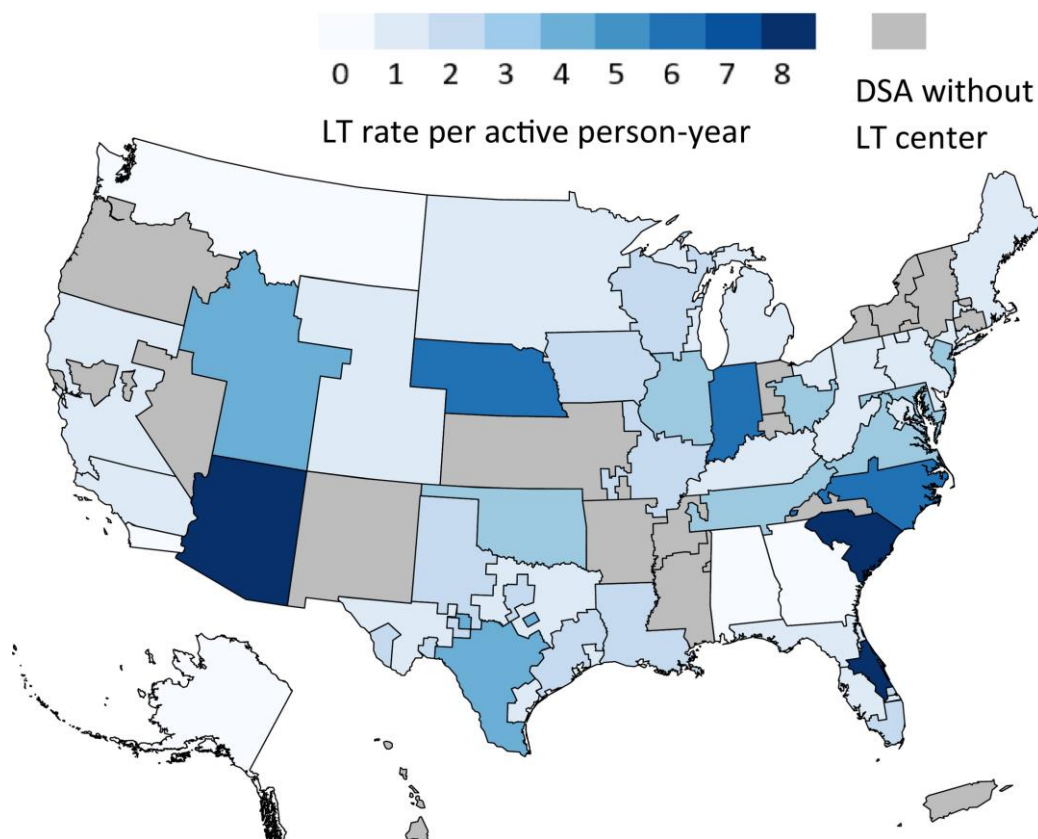
Hearts will be allocated within priority bin to candidates with the longest active waiting time within current medical urgency status or higher status

\* Geographic zones are defined by the distance between the donor hospital and transplant centers.  
Local: same donor service area  
Zone A: 0 – 500 miles  
Zone B: > 500 – 1000 miles  
Zone C: > 1000 – 1500 miles  
Zone D: > 1500 – 2500 miles  
Zone E: > 2500 miles

\* Primary includes all donor/candidate ABO pairs as shown in policy 3.7.8 (i)-(iv). All other compatible donor/candidate ABO pairs are secondary. Primary includes all 4 identical combinations and O donor/B candidate, A donor/AB candidate, and B donor/AB candidate. Secondary includes only O donor/A candidate and O donor/AB candidate.

Although unlikely, the match run for an adult donor heart can include ABO incompatible and in utero candidates. Although not shown above, these candidates would fall into bins 37- 62 according to the corresponding rules shown in the heart allocation flow chart for pediatric donors.

# DSAs abolished in lung allocation after regional disparities in lung transplant rates seen as a result of DSAs



# Purpose

This study sought to assess whether donor heart allocation within the DSA is associated with a survival benefit.

We hypothesize that DSA allocation did not lead to lower post-transplant survival when adjusted for ischemic time, recipient, donor and recipient-donor matching characteristics.

# Methods

## **UNOS data of Scientific Registry of Transplant Recipients (SRTR)**

- Recipients 18 years of age or older
- January 2010 - June 30<sup>th</sup> 2018 (Prior to allocation change)
- Excluded dual-organ transplantations
- Stratified recipients by DSA allocation vs. non-DSA allocation
- SRTR 1-year survival calculated for all recipients
- Logistic regression model used to assess graft failure at one year

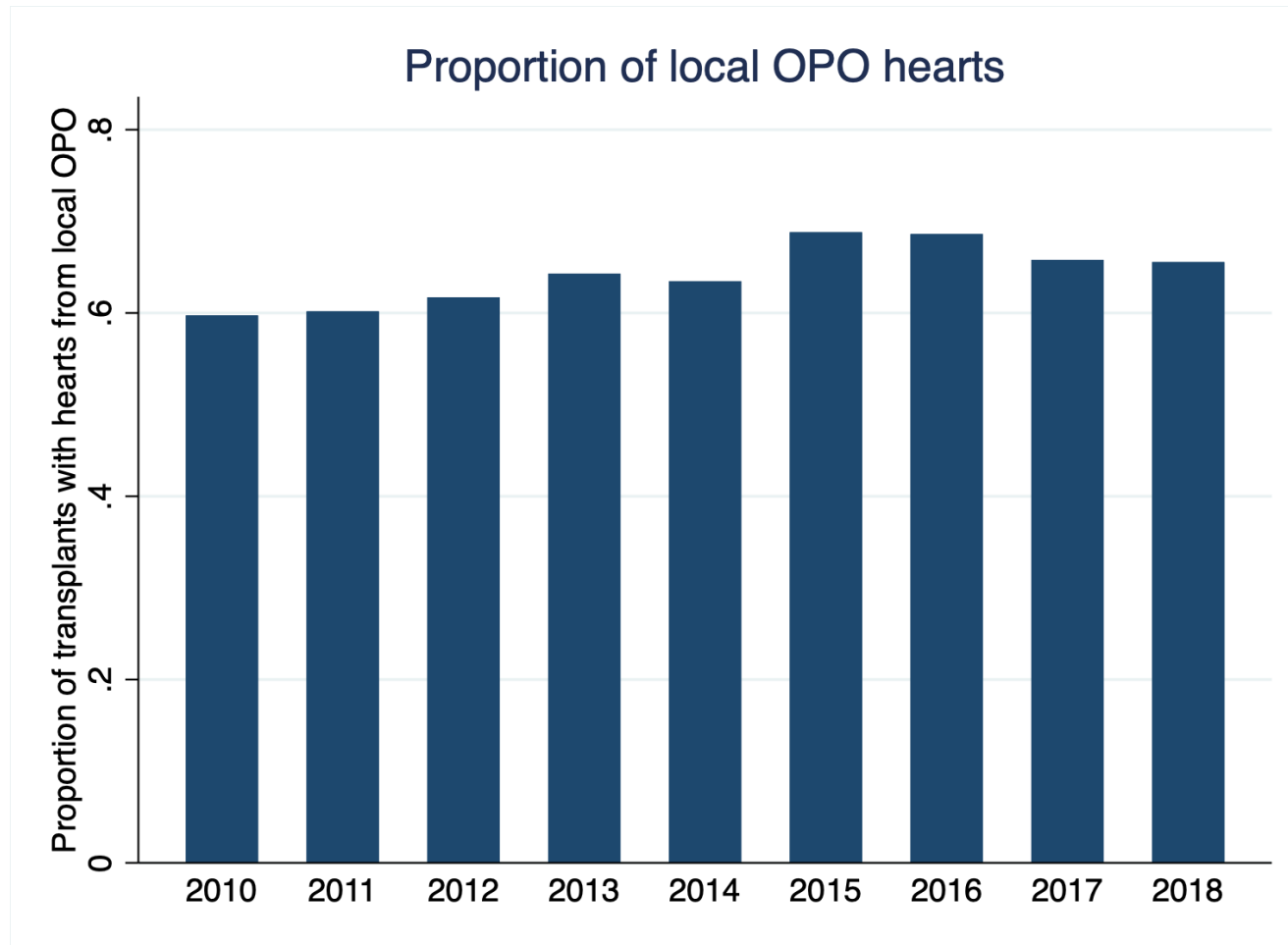
# Demographics: 19,545 transplant recipients

	Local DSA hearts	Imported hearts	p-value
<b>Recipient characteristics</b>	(n = 12,610)	(n = 6,935)	
Mean age (SD), years	53.4 (12.5)	53.7 (12.8)	0.0487
Male gender, %	76.0	69.4	<0.0001
Mean BMI (SD), kg/m <sup>2</sup>	27.5 (4.8)	27.0 (5.3)	<0.0001
Diabetes mellitus, %	28.3	28.9	0.3841
Smoking, %	45.9	45.3	0.4181
ECMO, %	0.9	0.7	0.1548
Ventricular assist device, %	57.0	52.4	<0.0001
Status prior to transplant			
Status 1A, %	61.5	68.8	<0.0001
Status 1B, %	35.5	25.4	<0.0001
Status 2, %	3.0	5.8	<0.0001



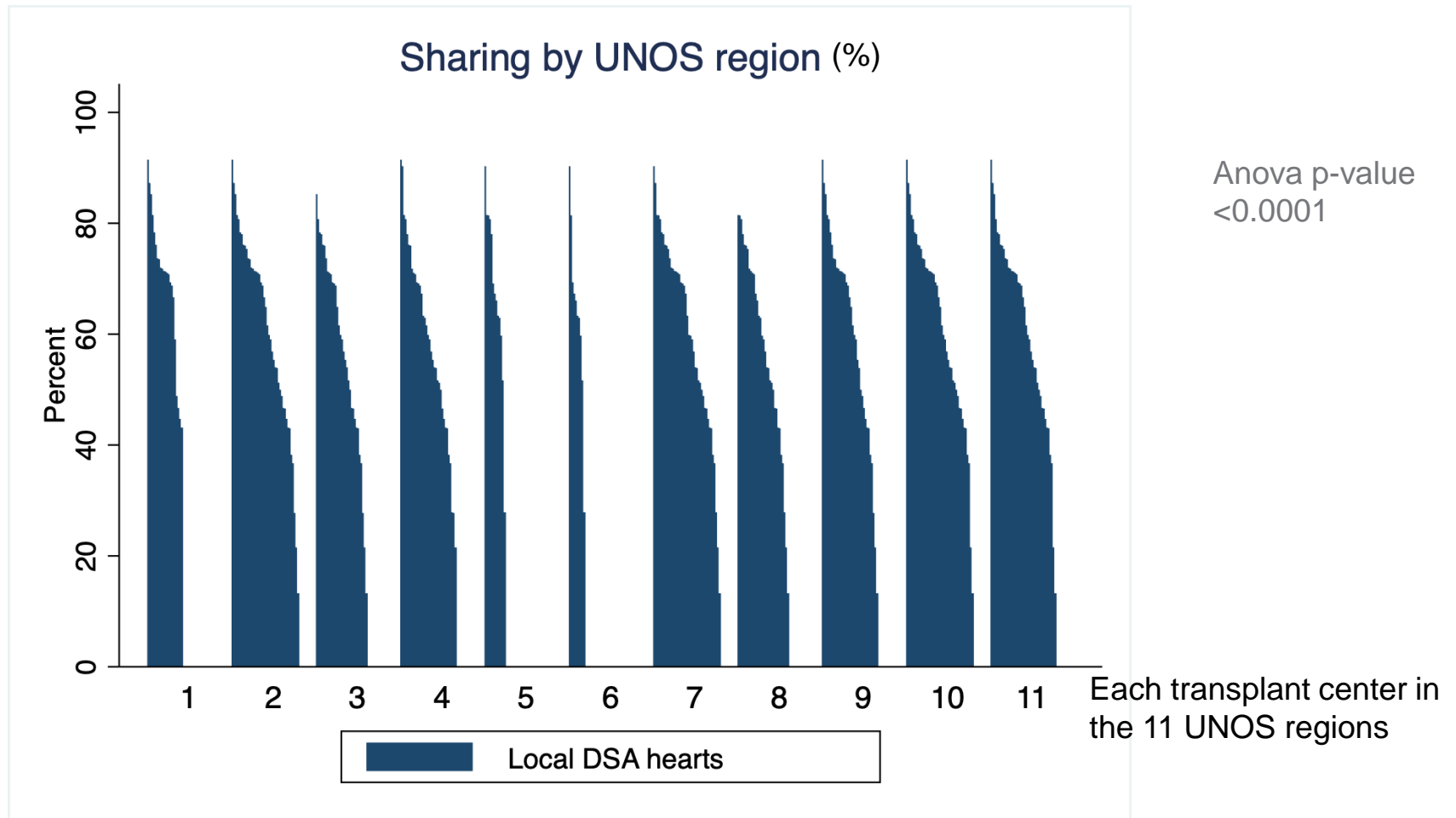


# Local transplantations within DSAs have increased over time



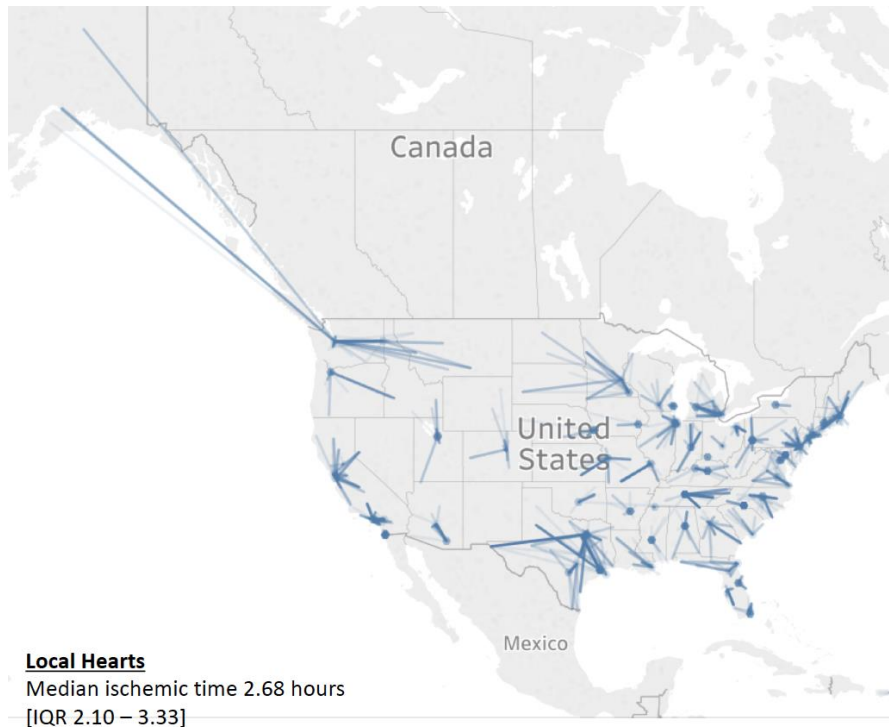
Average increase  
of 4.6%  
transplants per  
year

# Variation of sharing by DSA exists between regions

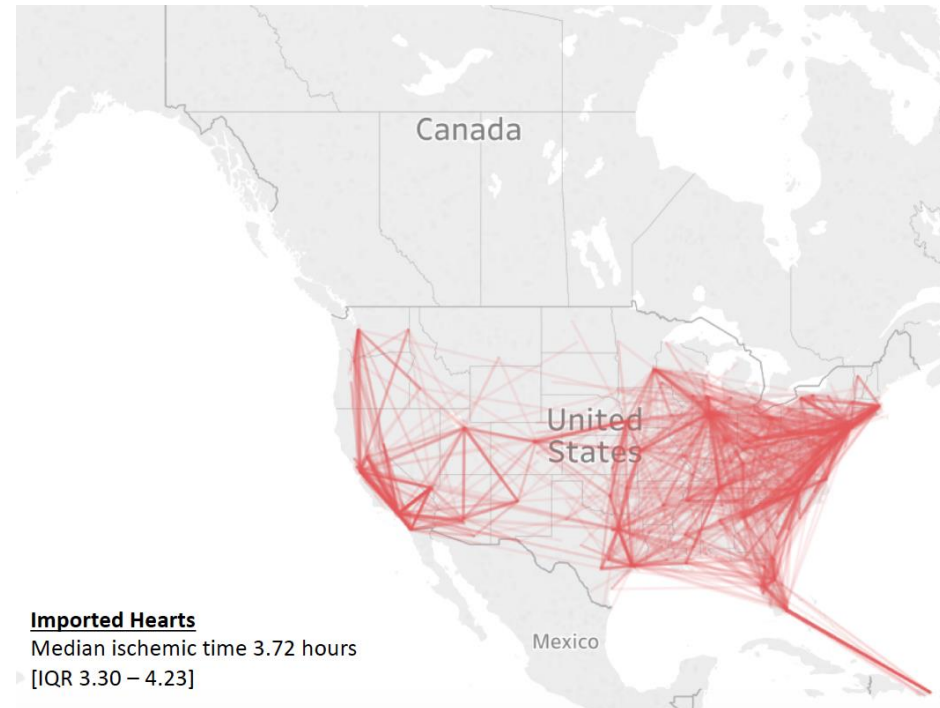


# Distance traveled and mean ischemic time: Local DSA vs. Imported transplantations

Heart procedure in local DSA



Heart imported from another DSA



# Preferential local allocation does not result in post-transplant survival benefit

## Effect of imported hearts on 1-year graft failure

	<b>Odds ratio</b>	<b>95% CI</b>	<b>P-value</b>
DSA effect (local vs. imported)	0.966	0.919-1.015	0.178
Center adjusted DSA sharing effect	0.966	0.909-1.051	0.269
DSA adjusted DSA sharing effect	0.966	0.907-1.029	0.287

# Summary

Following adjustment for recipient and donor factors, we found that allocation of organs within the DSA did not reduce one-year graft failure rates.

Thus preferential allocation of organs to local transplant programs in a DSA may be a violation of the Final Rule.

# Development following this analysis

As of January 9<sup>th</sup>, 2020:

The logo for the Organ Procurement and Transplantation Network (OPTN). It features the word "OPTN" in white, bold, sans-serif capital letters. The text is positioned on the left side of a dark blue rectangular background. The background has a subtle, wavy gradient that transitions from a darker blue on the left to a lighter, teal-like blue on the right.

**OPTN**

## **POLICY NOTICE**

***Eliminate the Use of DSAs in Thoracic Distribution***

# Future direction and questions for study

1. Evaluate the impact of the new allocation system after October 2018 on regional donor heart allocation
2. Did the elimination of the Donor Service Area have the intended effect?
3. Should linear geographical sharing be favored over concentric circular allocation zones?