

Overview and Current Trends of the Organ Transplantation System

David C. Mulligan, MD, FACS, FAST, FAASLD

President, Organ Procurement and Transplantation Network (OPTN)

United Network for Organ Sharing (UNOS)

Professor of Transplantation and Immunology

Yale University

Chronic Diseases in the U.S. 2019

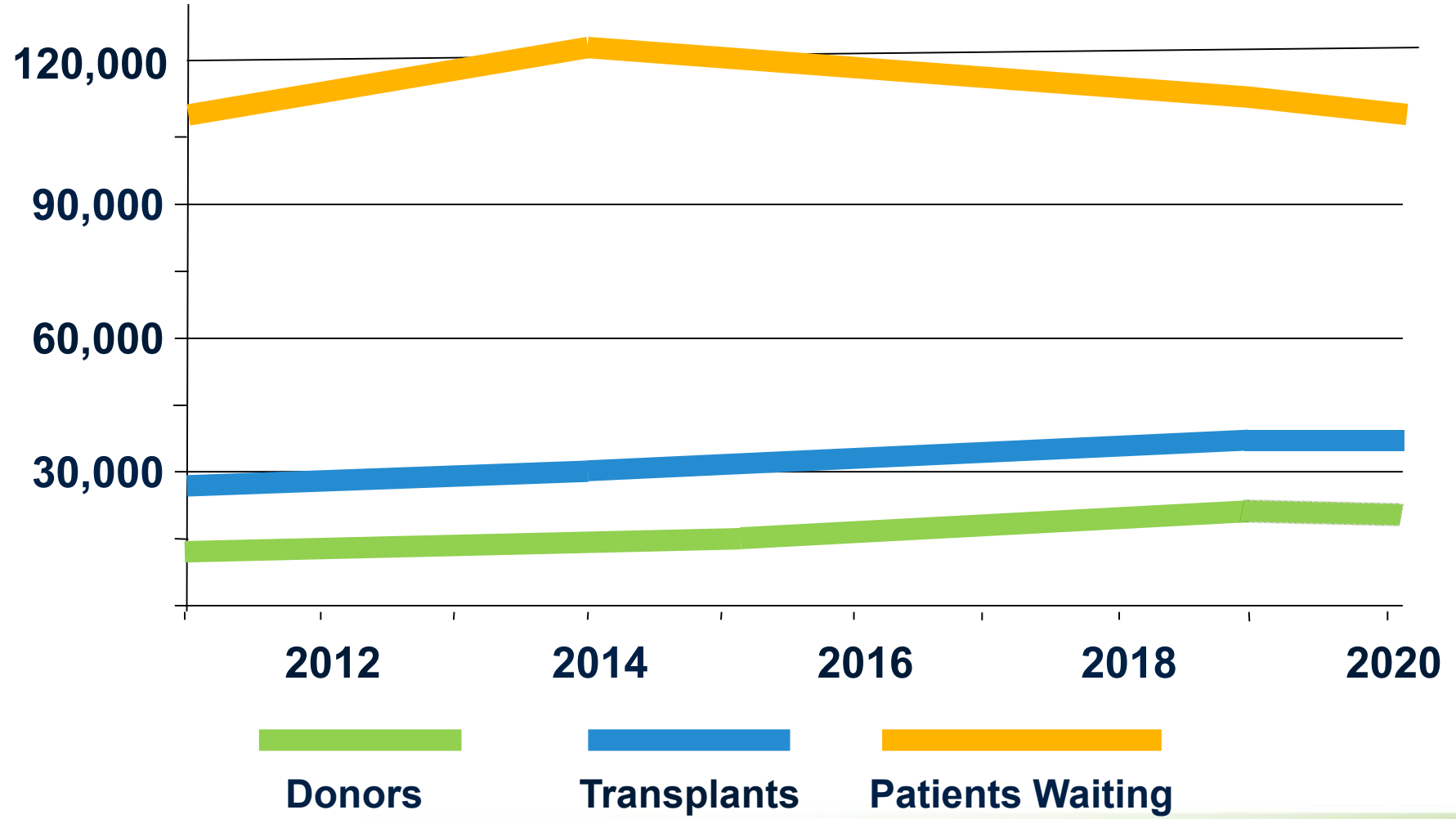


Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

- **Kidney** – 15% of US adults – 37 million people – are estimated to have CKD
 - Most (9 in 10) adults with CKD do not know they have it
- **Liver** – 1.8% of US adults – 4.5 million people are diagnosed with liver disease
- **Heart** – 12.1% of US adults – 33.3 million people diagnosed with heart disease
 - #1 cause of death in the US – over 660,000 deaths
- **Lung** – 1.5% of US adults – 3.8 million people diagnosed with COPD

Our Challenge

The U. S. Organ Shortage



UNOS Organization

Non-profit and charitable

Membership organization

Government contractor (OPTN)

- *Organ Procurement and Transplantation Network*

Who are our members?

As of February 2021

Transplant Hospitals	251
Organ Procurement Orgs.	57
Histocompatibility Labs	142
Public Orgs.	8
Medical/Scientific Orgs.	11
Individual Members	8

<https://optn.transplant.hrsa.gov/members/>

What OPTN Does

Maintains national transplant list

Facilitates organ distribution, transplantation

Establishes equitable policies and membership standards

Monitors members for policy compliance

Collects/validates/reports transplant data

Promotes most/best use of available organs

What UNOS Does

Supports the transplant profession

- Research
- Conference planning
- IT projects and services

Supports/educates transplant patients and families

Honors and supports organ donors

Actively participates in the Richmond community

Reaches out via social media

Early transplant history

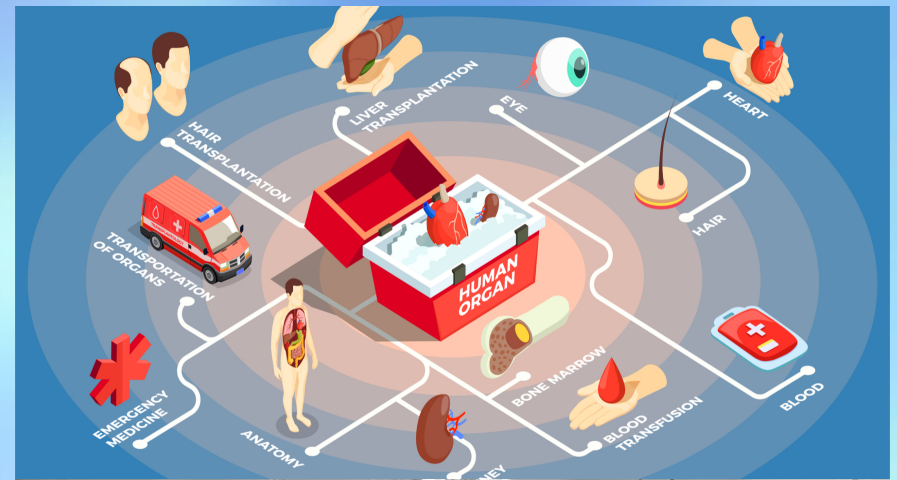
Through mid-1970s: Local placement/allocation decisions; “sharing” very informal

UNOS (1977): database of kidney patients at participating transplant centers

1982: Organ Center established to help place organ offers

1984: UNOS incorporated as independent organization

1984: National Organ Transplant Act calls for national allocation network (OPTN)



Methods of Donation

Living donation

- Directed donation
- Non-directed (“Good Samaritan”)
- Kidney paired donation (KPD)

Deceased donation

- Brain death
- Circulatory death (DCD)

OPTN Roles in Living Donation

Maintaining quality standards and requirements

- Training/experience for key personnel at living donor programs
- Minimum requirements for donor evaluation, informed consent

Collecting Data

KPD Pilot Program (also supported by private, charitable funds and efforts)

Organ Matching

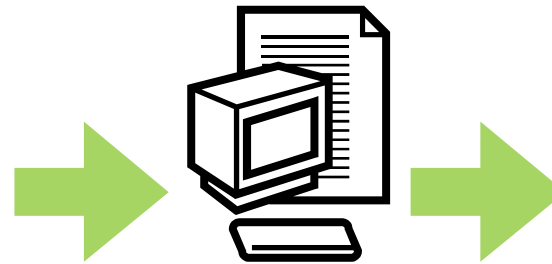
Donor organ



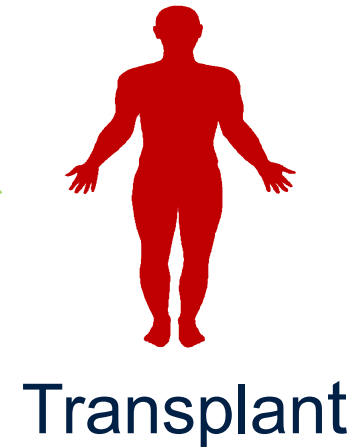
UNOSSM

UNITED NETWORK FOR ORGAN SHARING

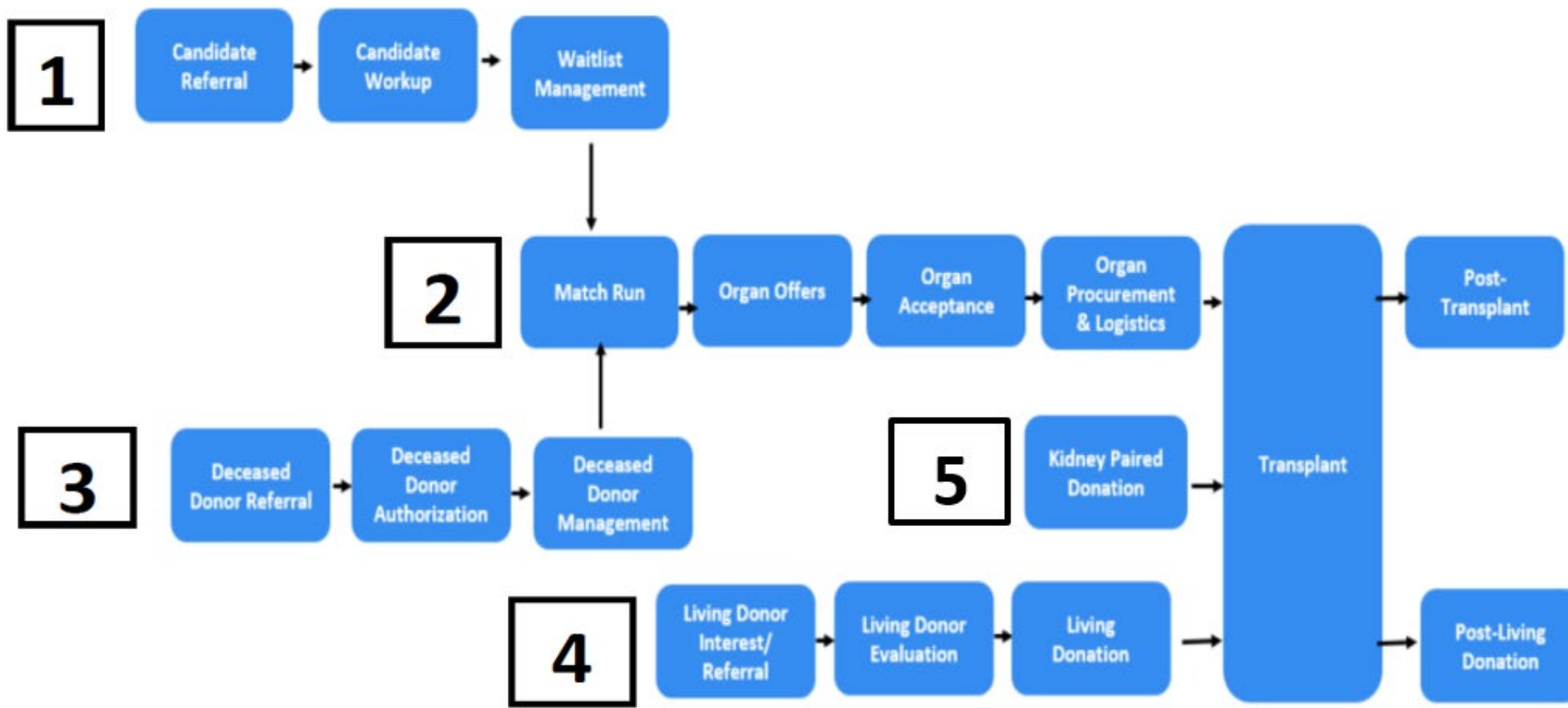
National
computer
matching
system



Potential
recipient list



Transplant Life Cycle





Organ Matching Criteria



Medical urgency

Blood type

Organ size

Waiting time

Geographic distance

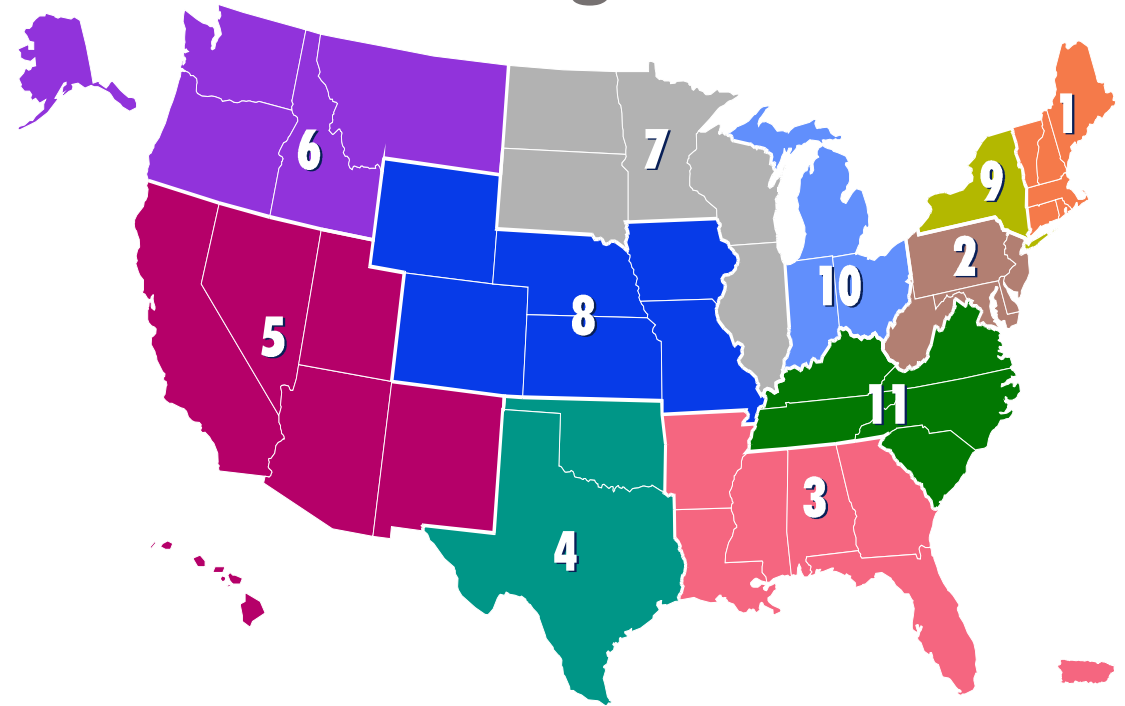
Map-based distribution

Local



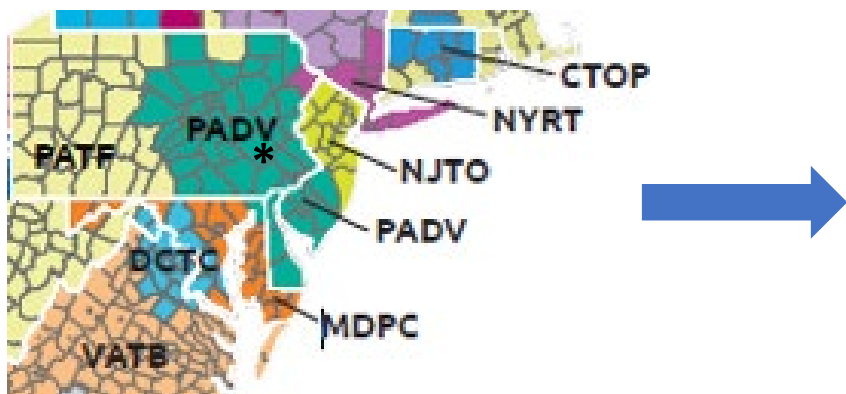
Donation Service
Areas

Regional



U.S. Kidney Allocation Policy Trajectory

DSA-based allocation



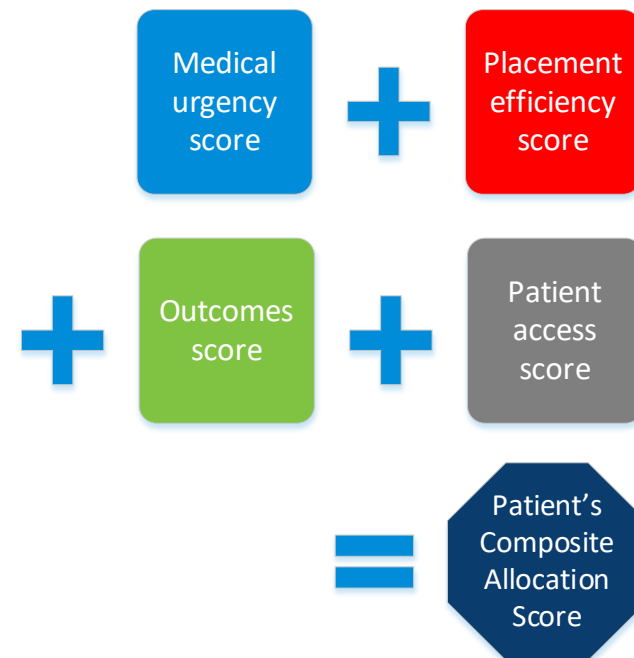
Today

Broad circles



Interim horizon

“Continuous distribution”



Ultimate destination

Organ Center's Roles



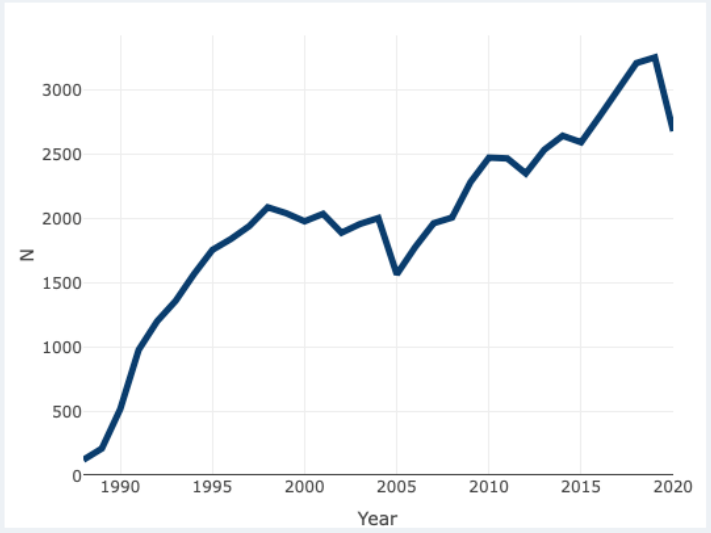
- Organ placement (25+ per day)
- Organ transportation
- 24/7 member support
- System troubleshooting

Registrations on the Waitlists

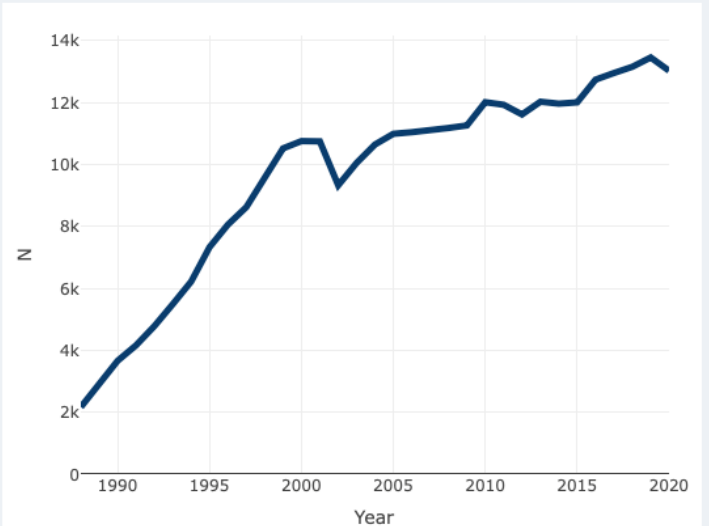
National Kidney Waitlist Additions by Year



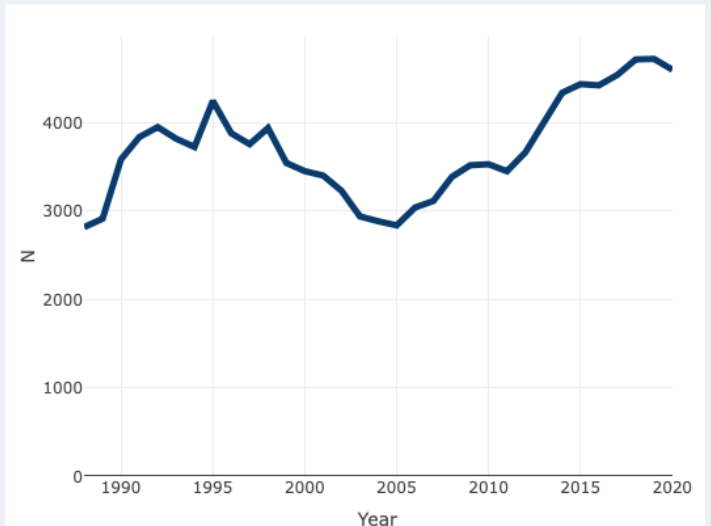
National Lung Waitlist Additions by Year



National Liver Waitlist Additions by Year



National Heart Waitlist Additions by Year



1 yr Survivals After Transplant

National Deceased Donor Kidney Patient and Graft Survival as of March 05, 2021

95.81

2019 1-Year
Patient Survival



93.57

2019 1-Year
Graft Survival



National Liver Patient and Graft Survival as of March 05, 2021

93.51

2019 1-Year
Patient Survival



91.58

2019 1-Year
Graft Survival



National Heart Patient and Graft Survival as of March 05, 2021

90.70

2019 1-Year
Patient Survival



90.36

2019 1-Year
Graft Survival



National Lung Patient and Graft Survival as of March 05, 2021

89.29

2019 1-Year
Patient Survival

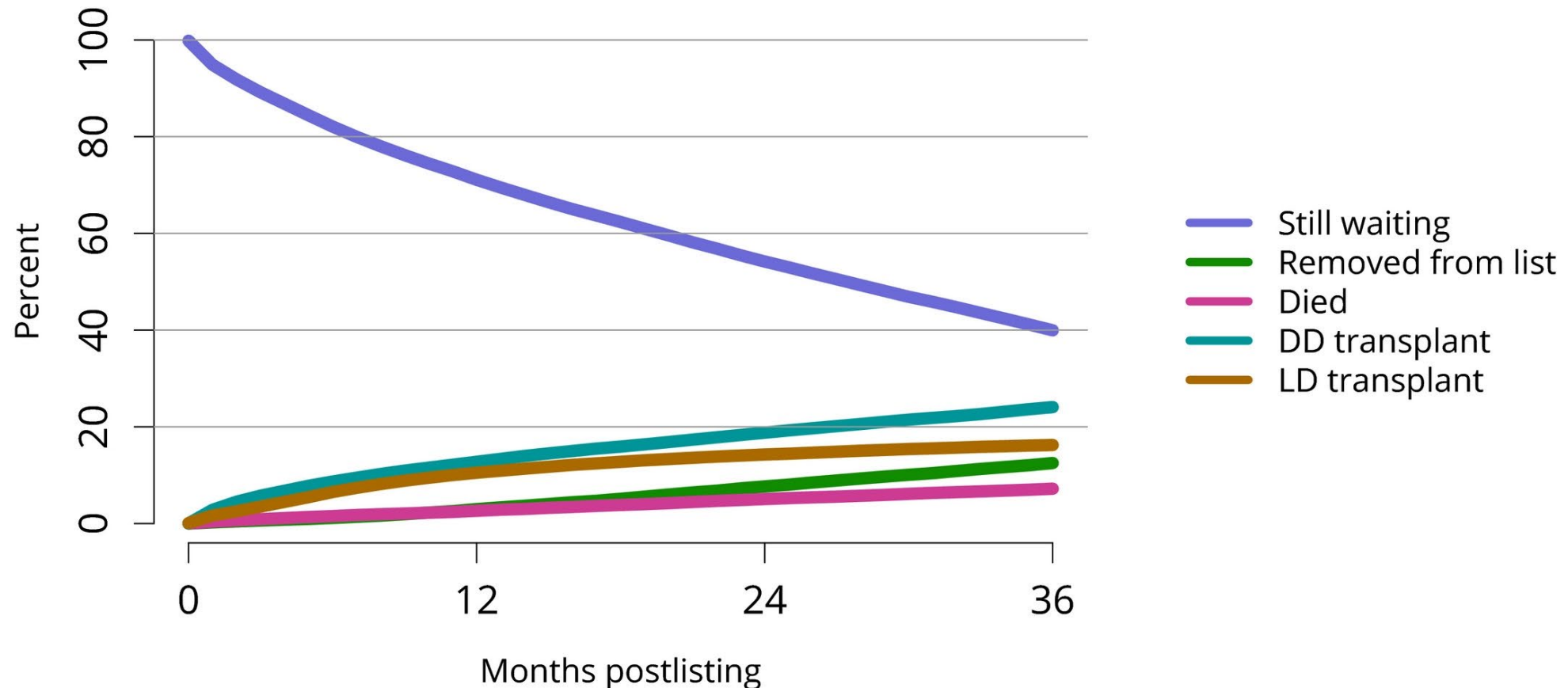


89.04

2019 1-Year
Graft Survival

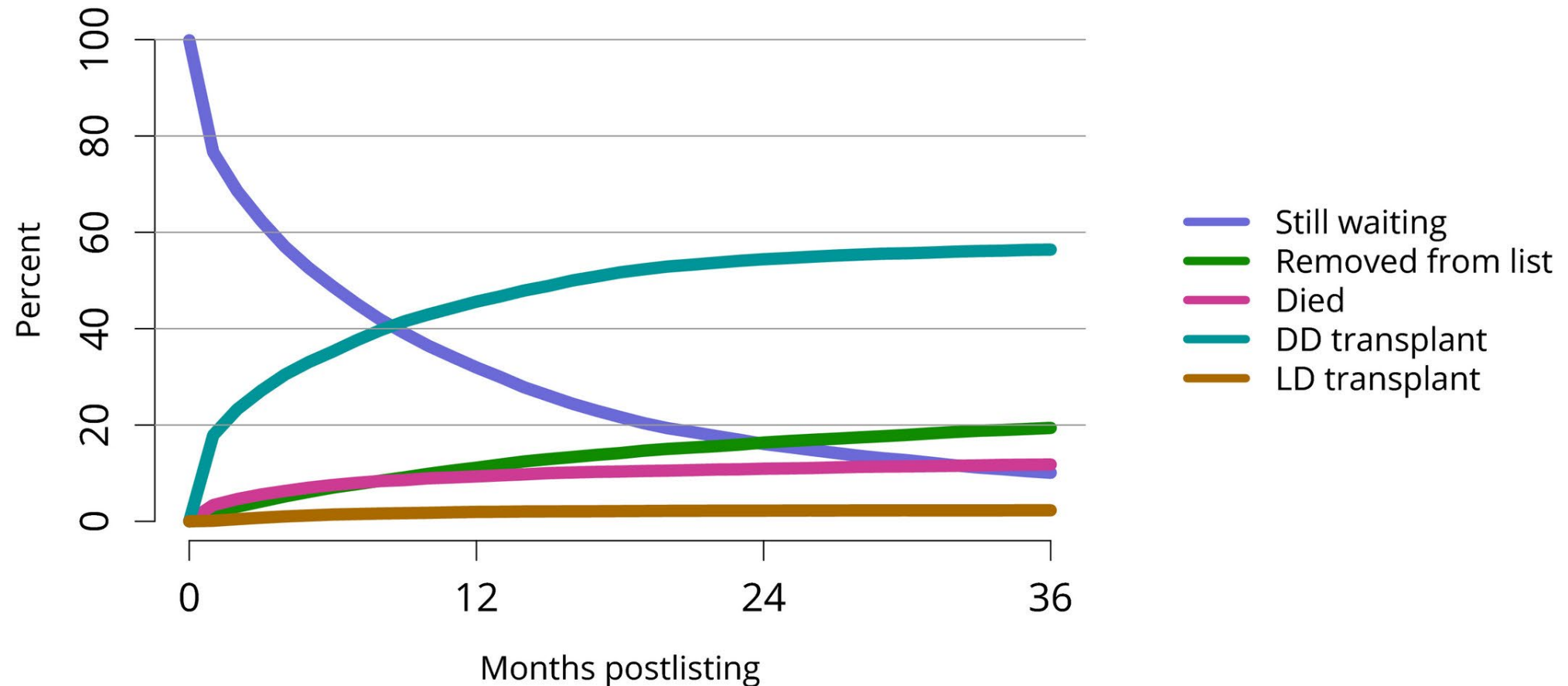


Waiting List Outcomes - Kidney



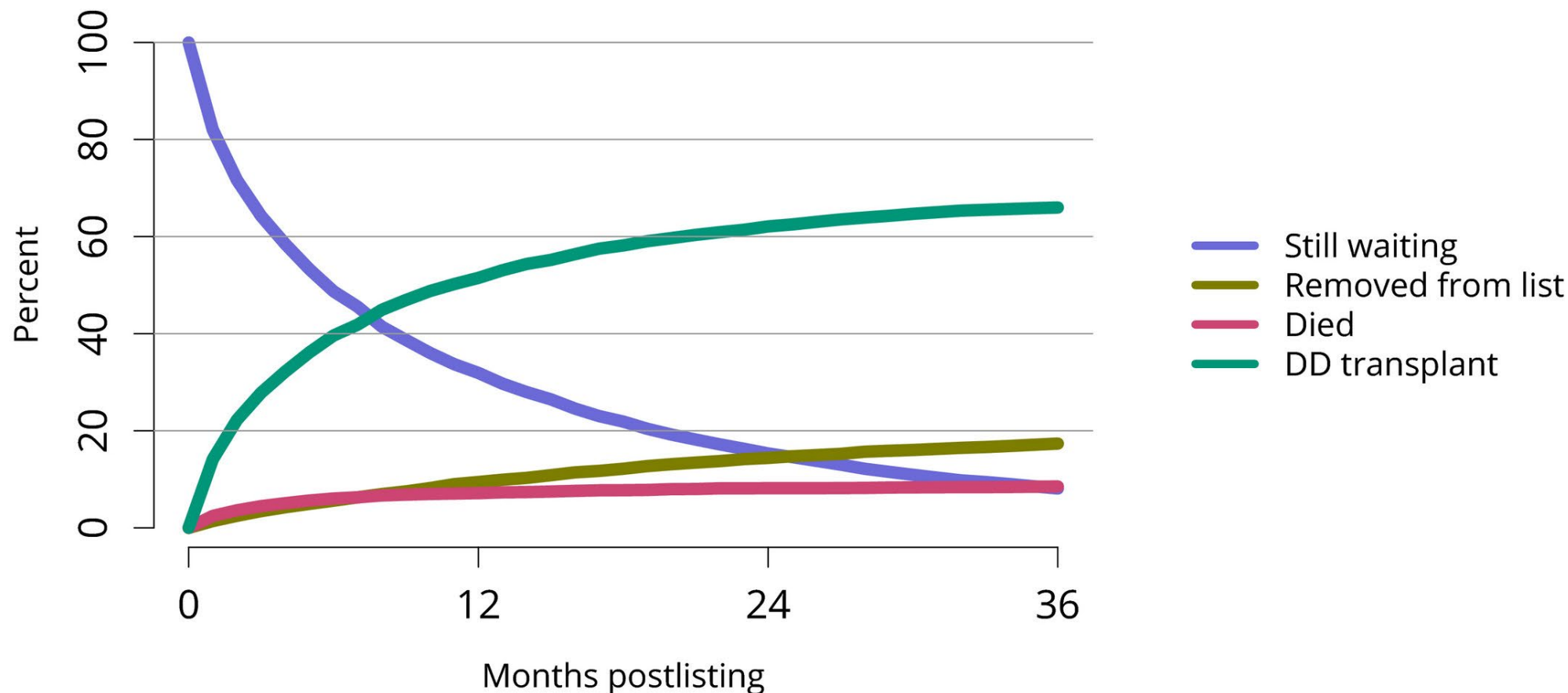
- Less than 25% of adult candidates receive a deceased donor kidney within 3 years.
- The average adult kidney waiting time tends to be around 5 years.
- About 30% of kidney transplant recipients receive a living donor kidney transplant.

Waiting List Outcomes - Liver



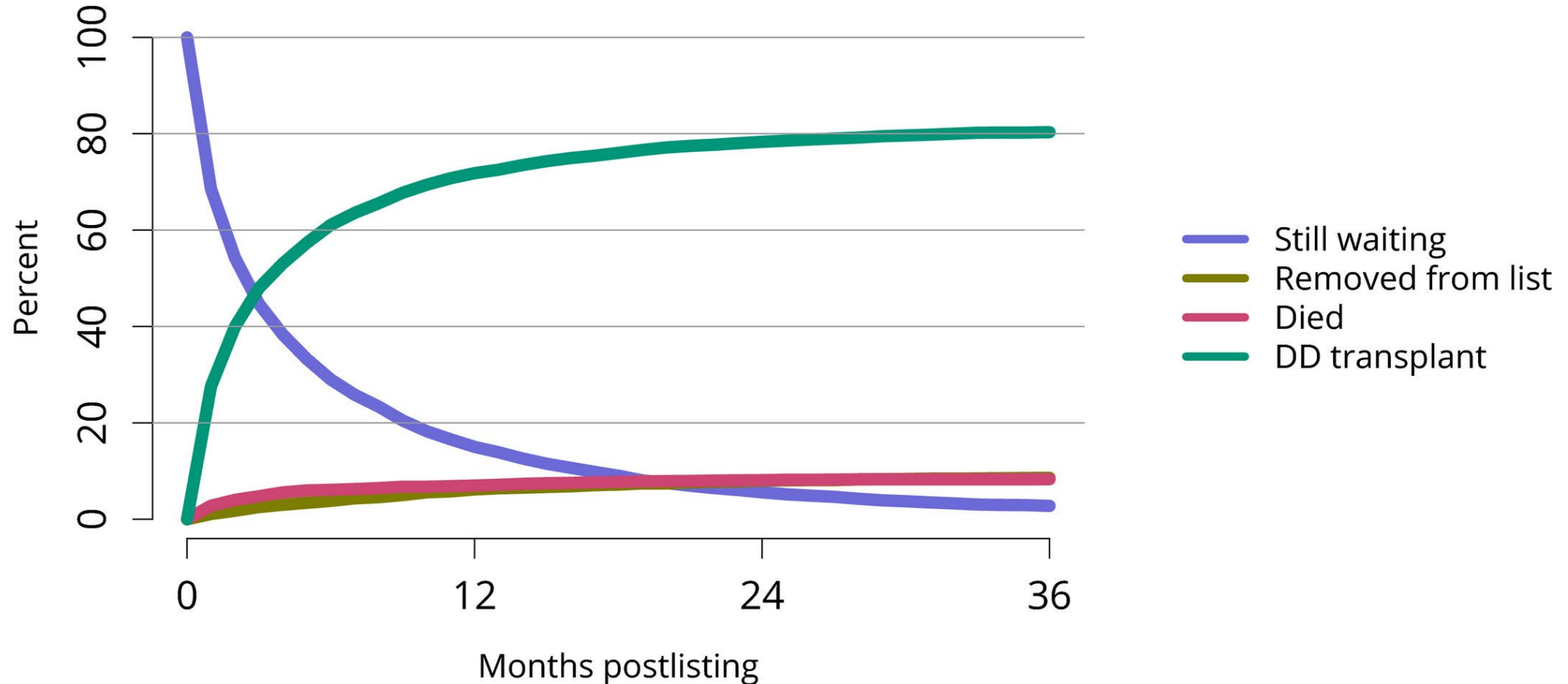
- About 60% of adult liver candidates receive a deceased donor liver transplant by 3 years.
- The median time to transplant is a little over a year.
- About 6% of liver recipients receive a living donor liver transplant.

Waiting List Outcomes - Heart



- Over 60% of adult candidates receive a deceased donor heart transplant within 3 years.
- The median time to heart transplant is about a year.

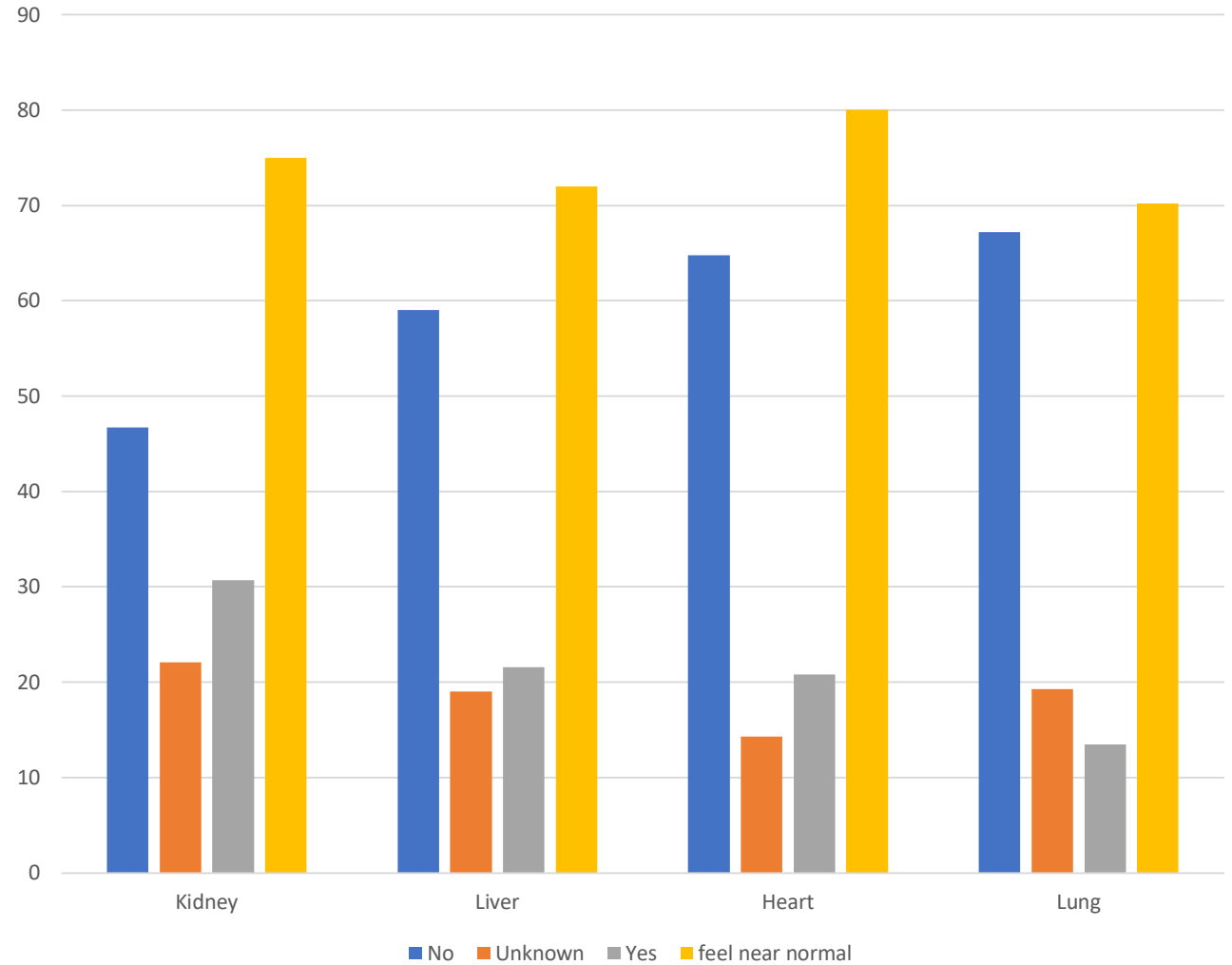
Waiting List Outcomes - Lung



- 80% of adult candidates receive a deceased donor lung transplant within 3 years.
- The median time to lung transplant is less than 6 months.

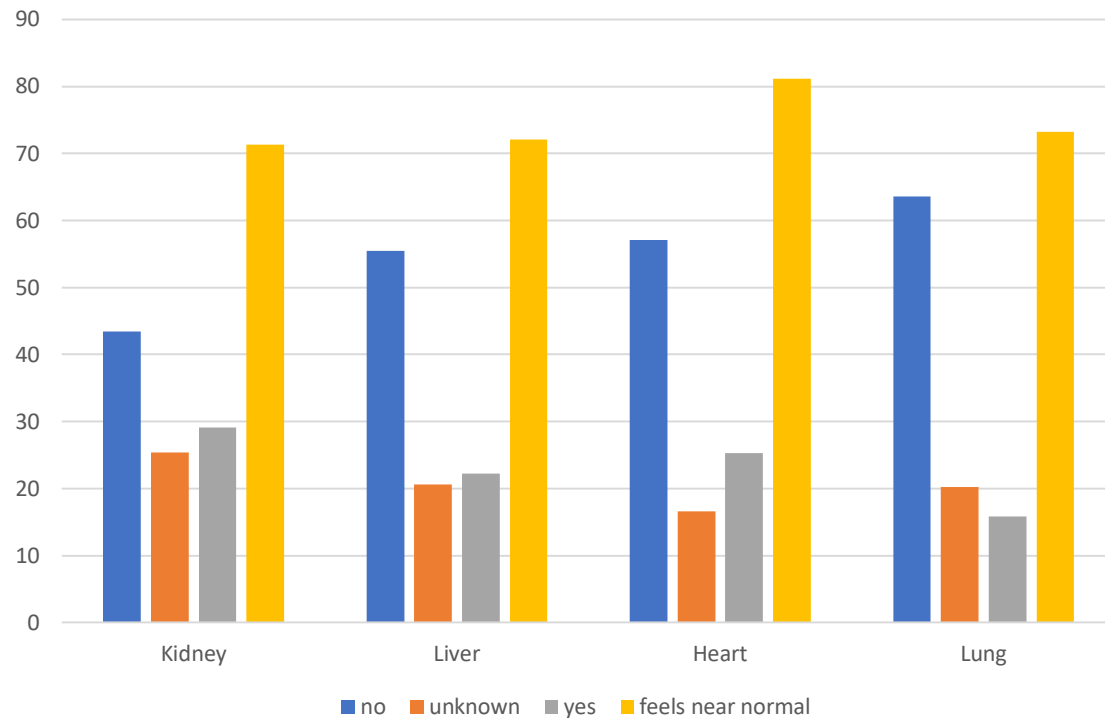
Return to Work and QOL at 1 year post transplant

Return to Work and QOL at 1yr(%)
Age 18-65yrs

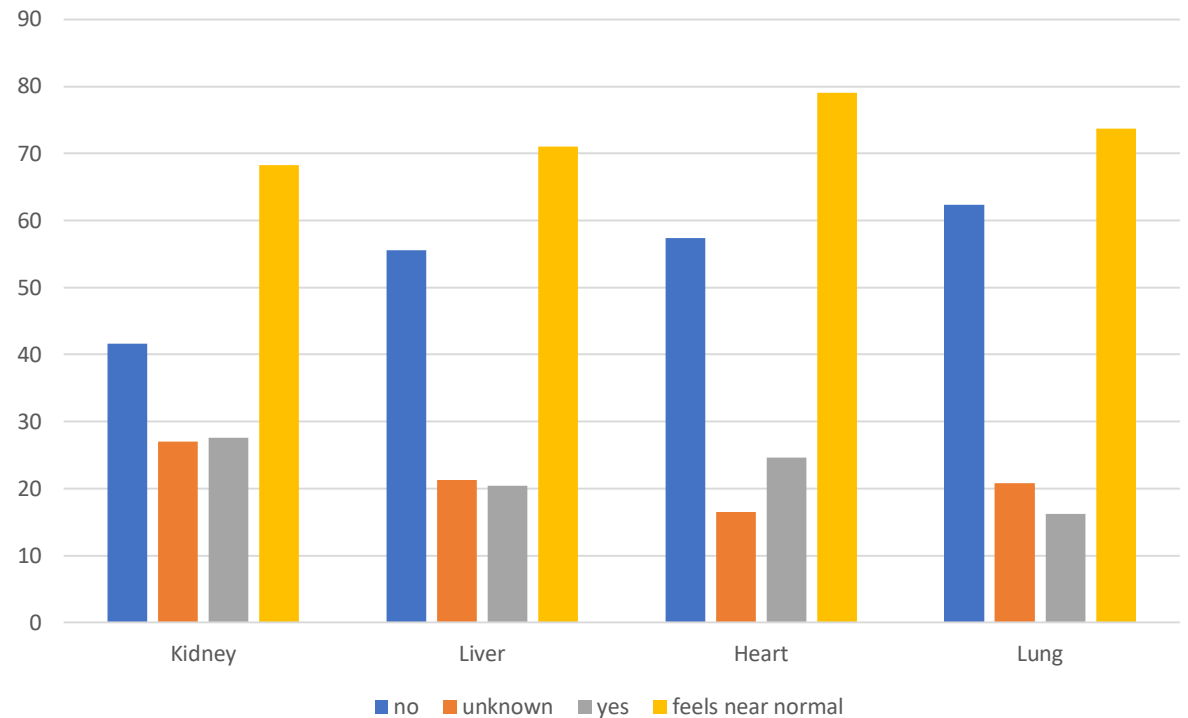


Return to Work and QOL at 3 and 5 years

Return to Work at 3yrs & QOL(%)
ages 18 - 65yrs



Return to Work & QOL 5 yrs(%)
Ages 18 - 65yrs



Summary

Growing incidence of solid organ diseases in the United States is causing high morbidity and mortality

Success of Solid Organ Transplantation as measured by patient and graft survivals have achieved record heights

Collaborations between OPO's and Transplant Centers through work with UNOS/OPTN has increased deceased donors and transplants every year for the past decade

More than half of transplant recipients feel normal to nearly normal, yet only about 1/3rd actually return to work

Important information about functional status in transplant patients remains unknown for 16 – 27% out 5 yrs and beyond
