

Liver Transplant Overview

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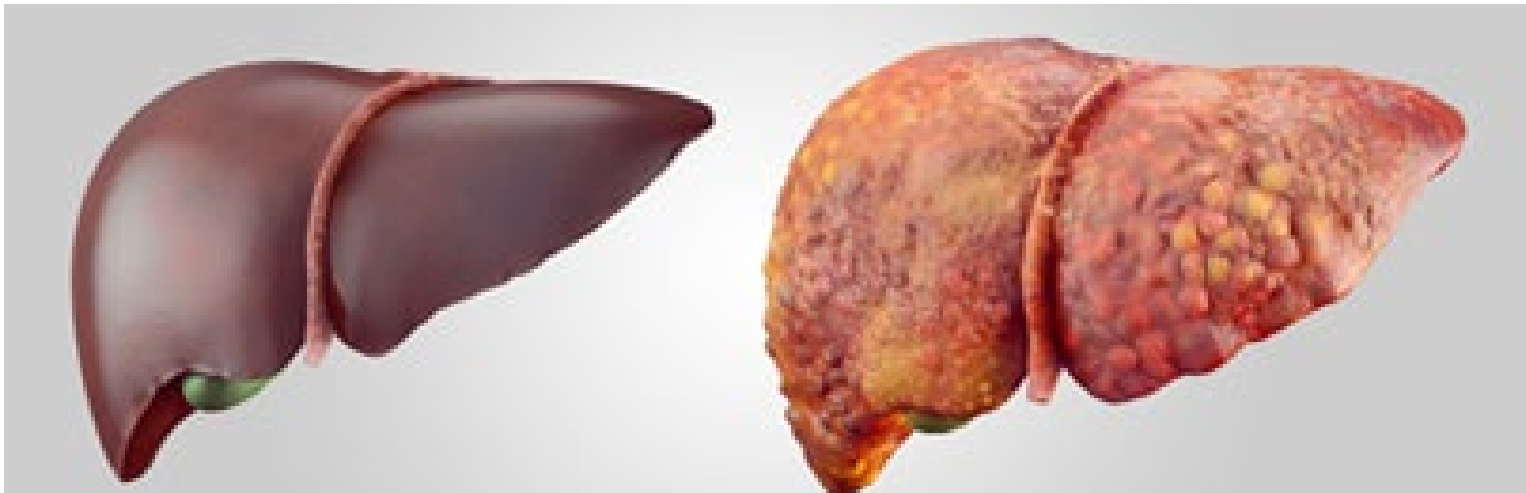
Center for Health Equity Research and Promotion

VA Pittsburgh Healthcare System

University of Pittsburgh

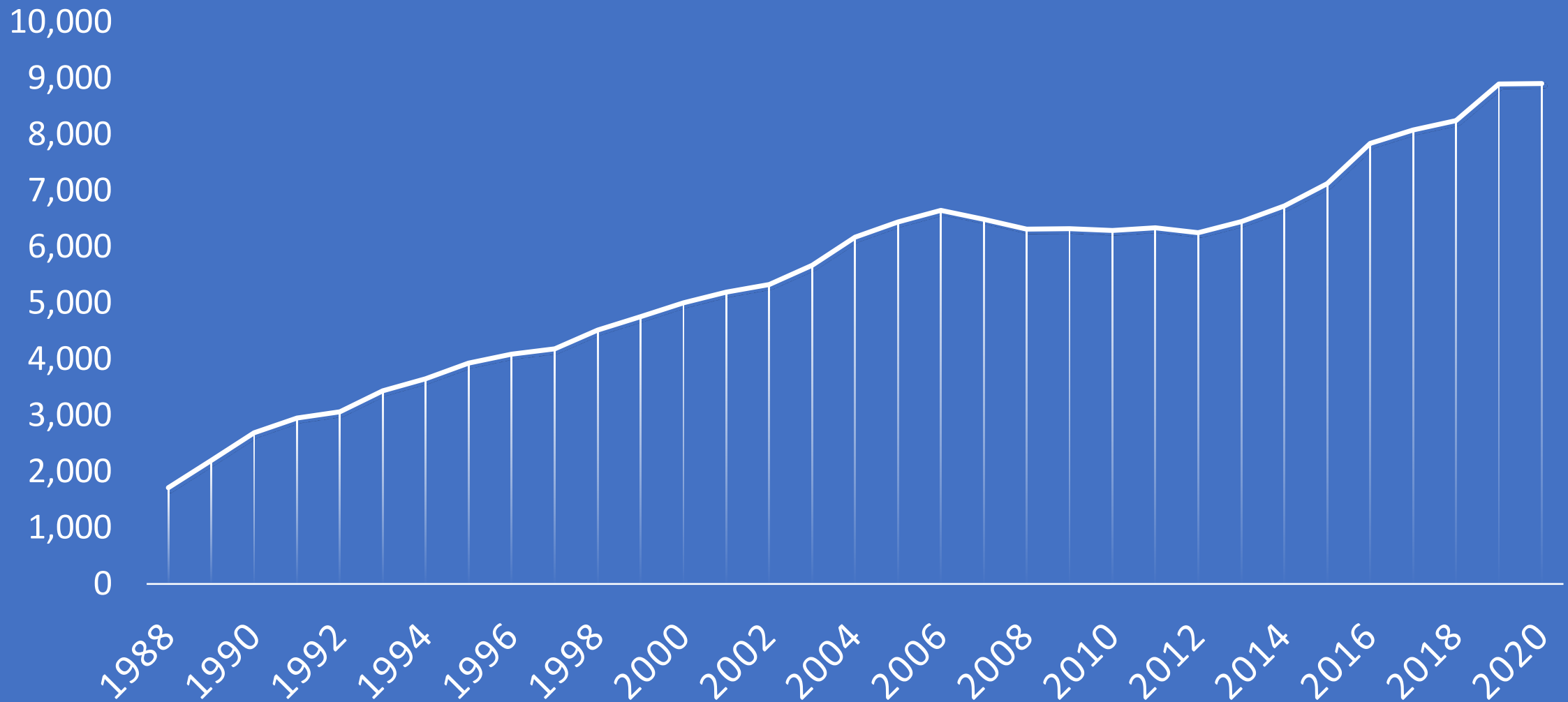
Liver disease is common

- 12th leading cause of death
- ~4 million people in the US have cirrhosis
- Many more people in the US are at risk
 - 25% have fatty liver disease
 - 15 million have alcohol use disorder
 - 2.4 million have chronic HCV
 - HCC is the fastest rising cause of cancer

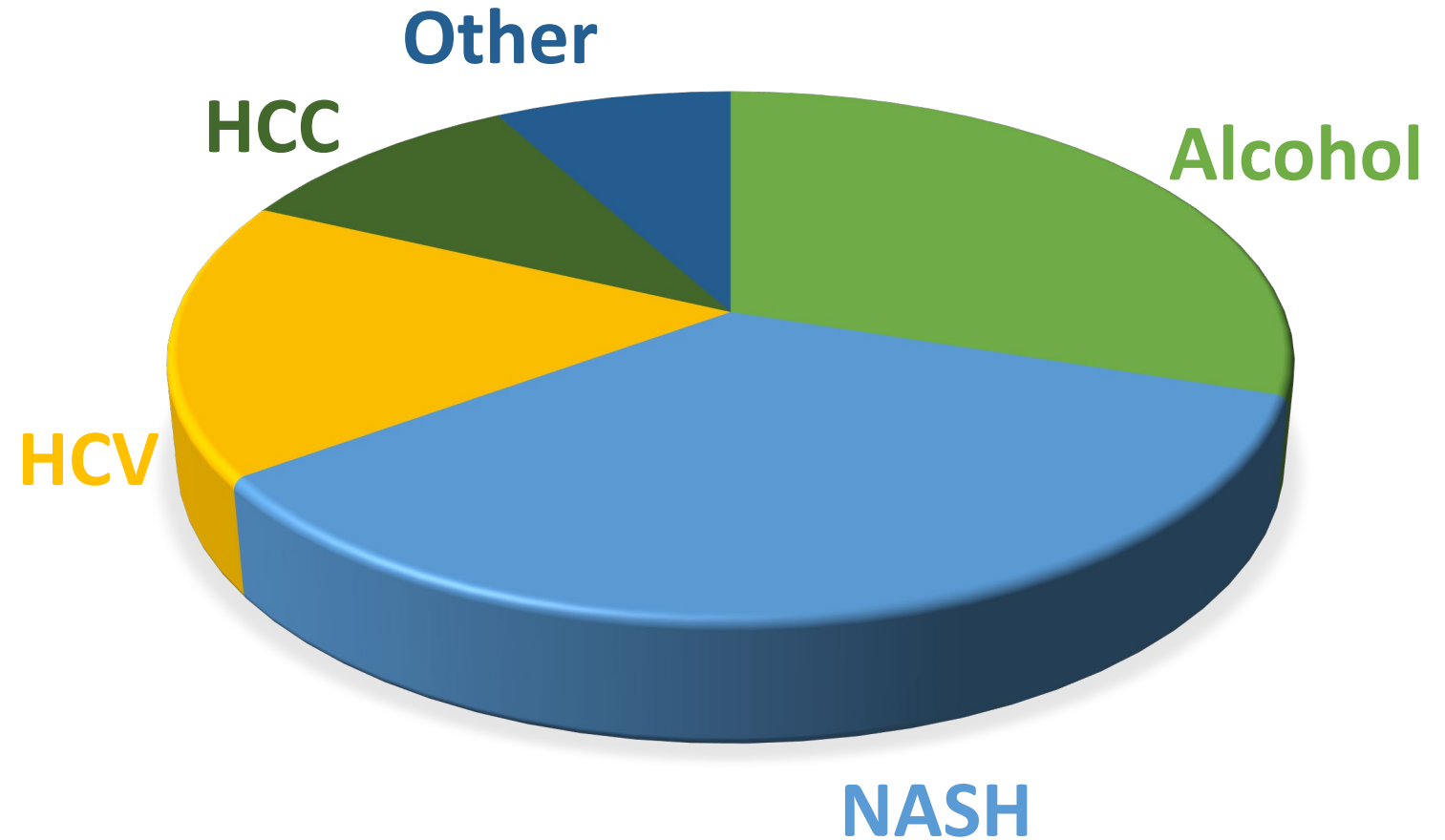


Photos and statistics are from
CDC and NIH websites

US LIVER TRANSPLANTATION IS INCREASING

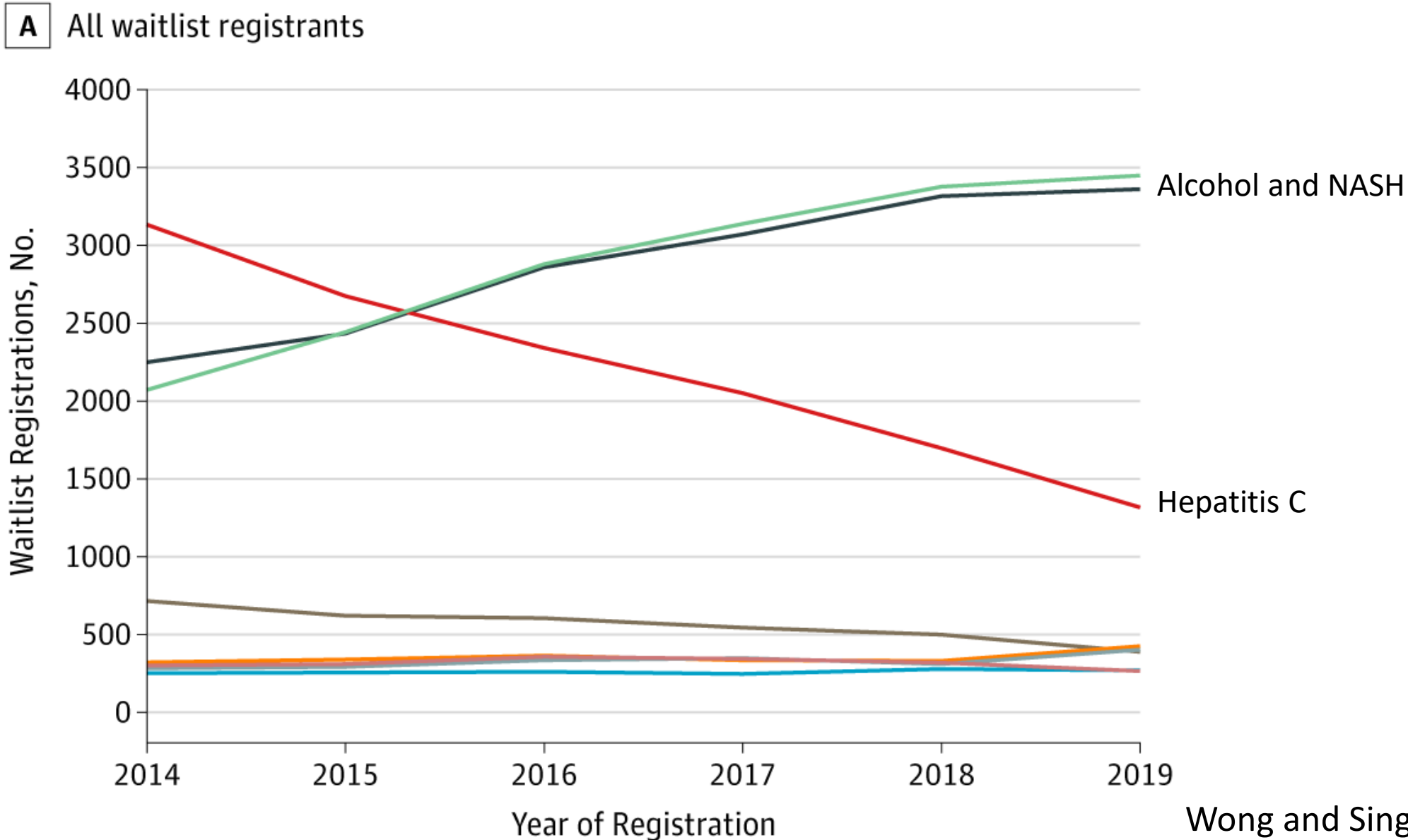


Current
Etiologies of
Patients on
the Waitlist



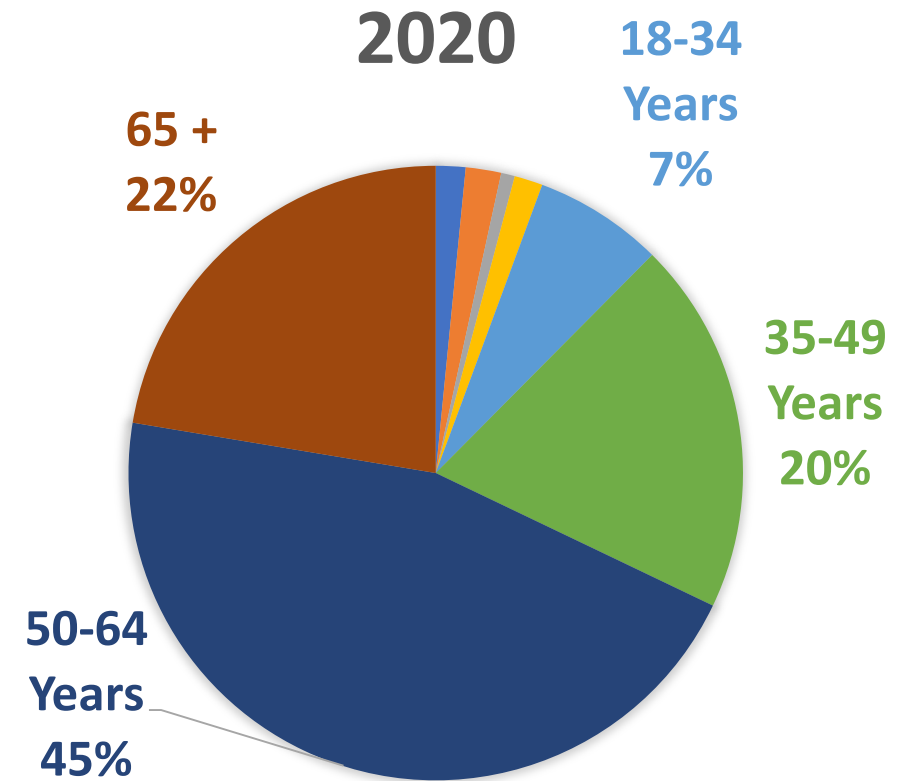
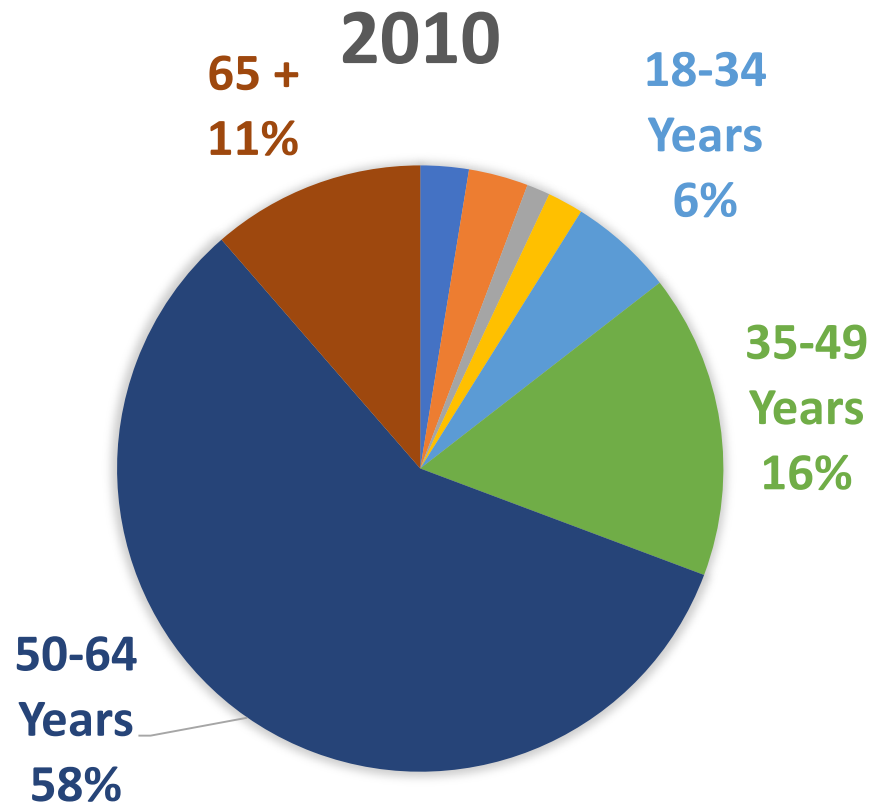
Data to make the graphic were pulled from OPTN/SRTR 2018 Annual Report

Liver disease is changing in the US



Wong and Singal (2020) JAMA open network

The recipient population is aging

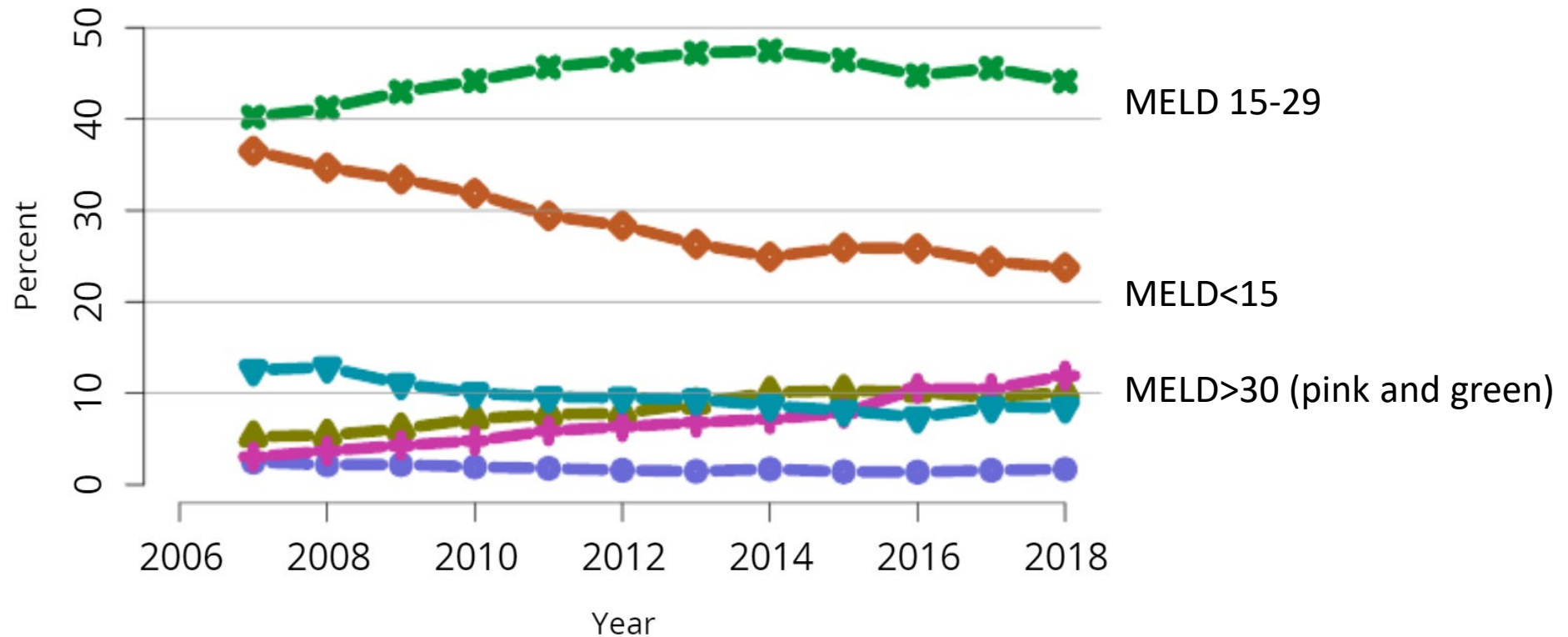


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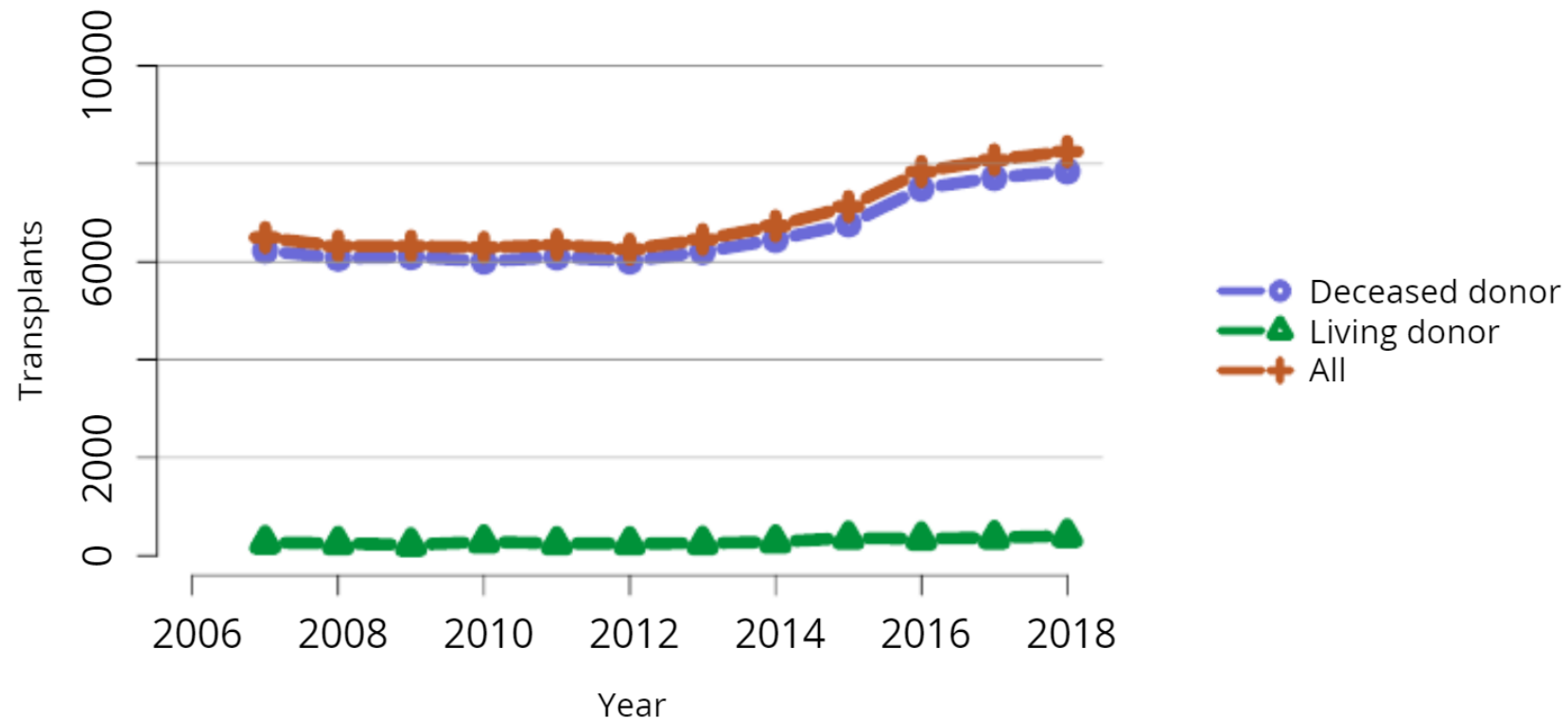
MELD at transplant is increasing

Model for End-stage Liver Disease (MELD)

$$3.78 \times \ln[\text{serum bilirubin (mg/dL)}] + 11.2 \times \ln[\text{INR}] + 9.57 \times \ln[\text{serum creatinine (mg/dL)}] + 6.43$$



Living donor liver transplant is increasing

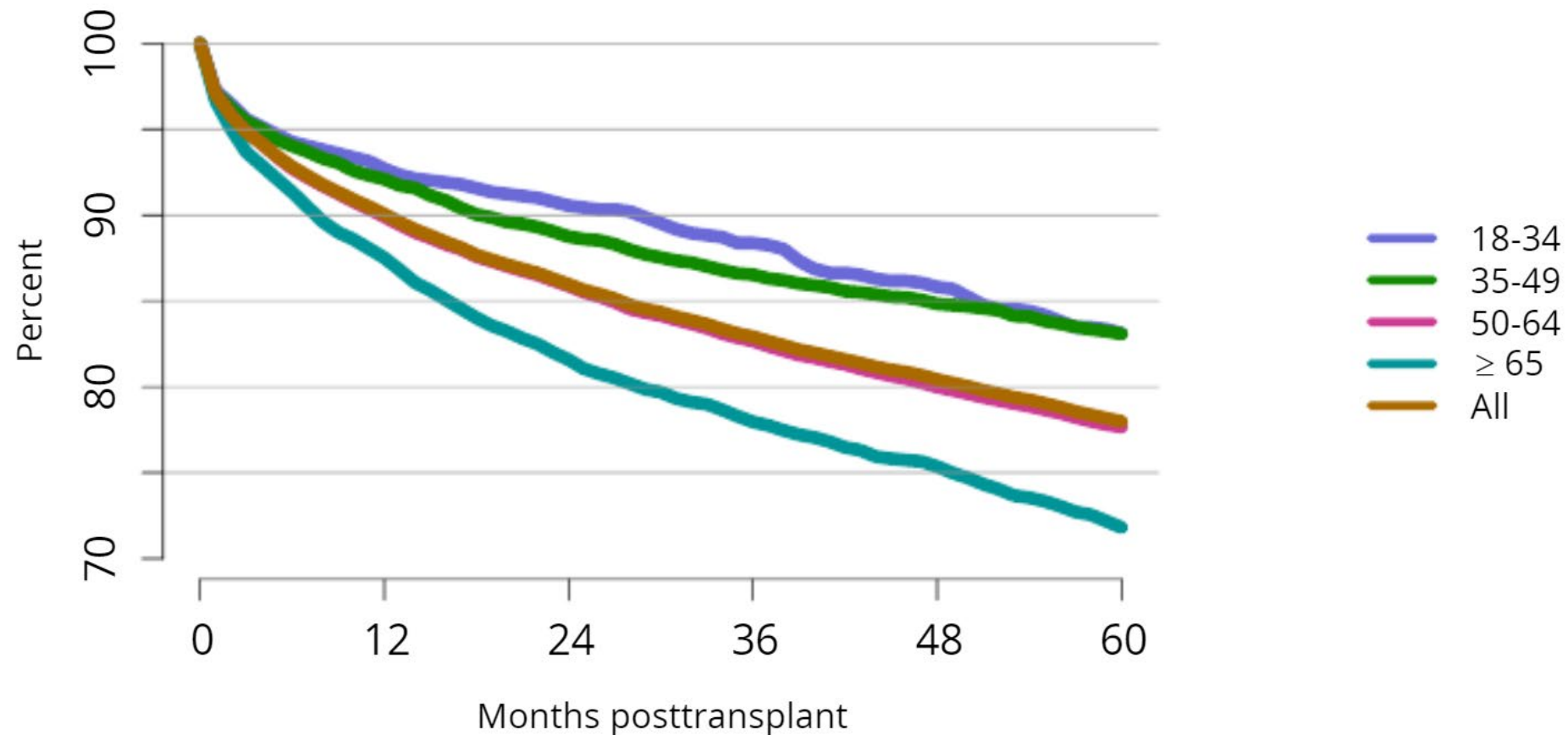


- 
- 1 year: 86%
 - 3 years: 78%
 - 5 years: 72%
 - 20 years: 53%

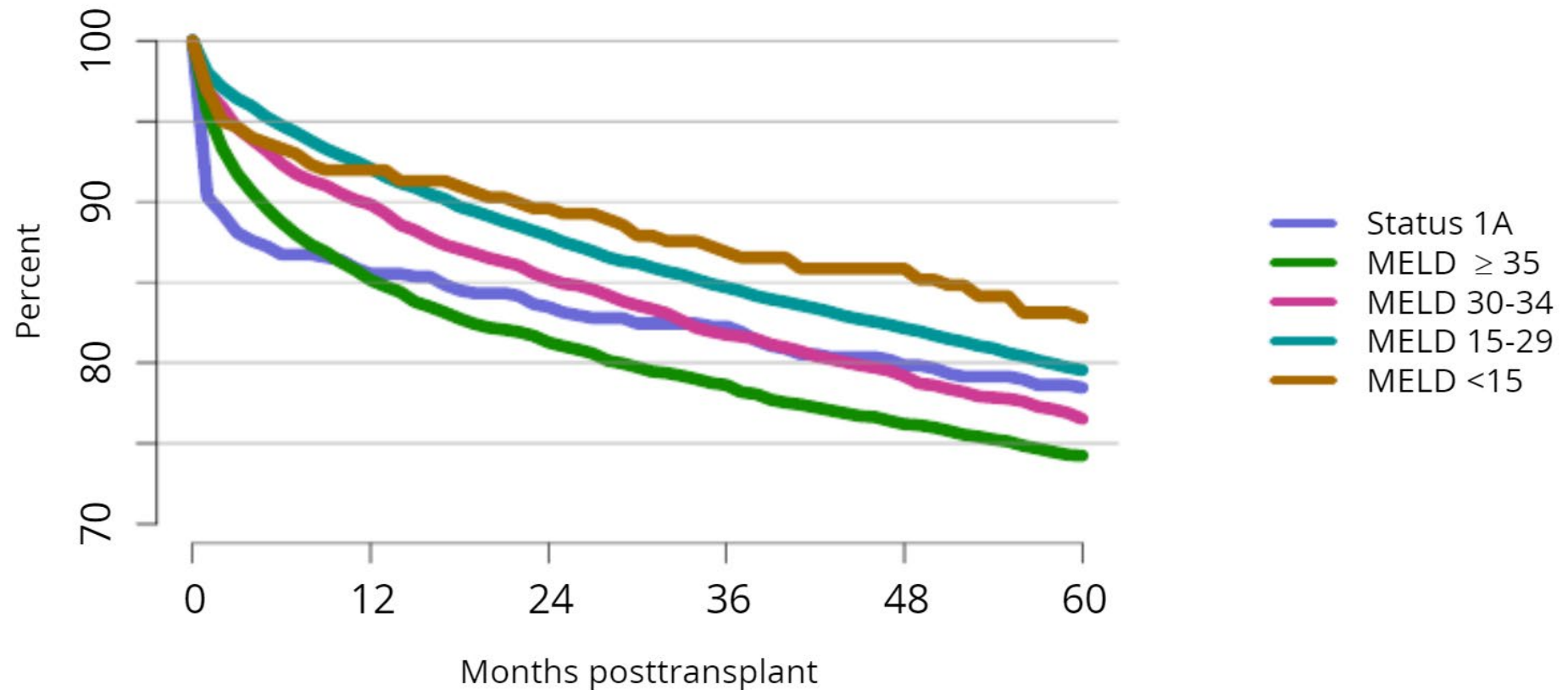
Transplant Survival

Kwong et al. (2018) OPTN/SRTR Annual Data Report: Liver
<https://onlinelibrary.wiley.com/doi/epdf/10.1111/ajt.15674#>

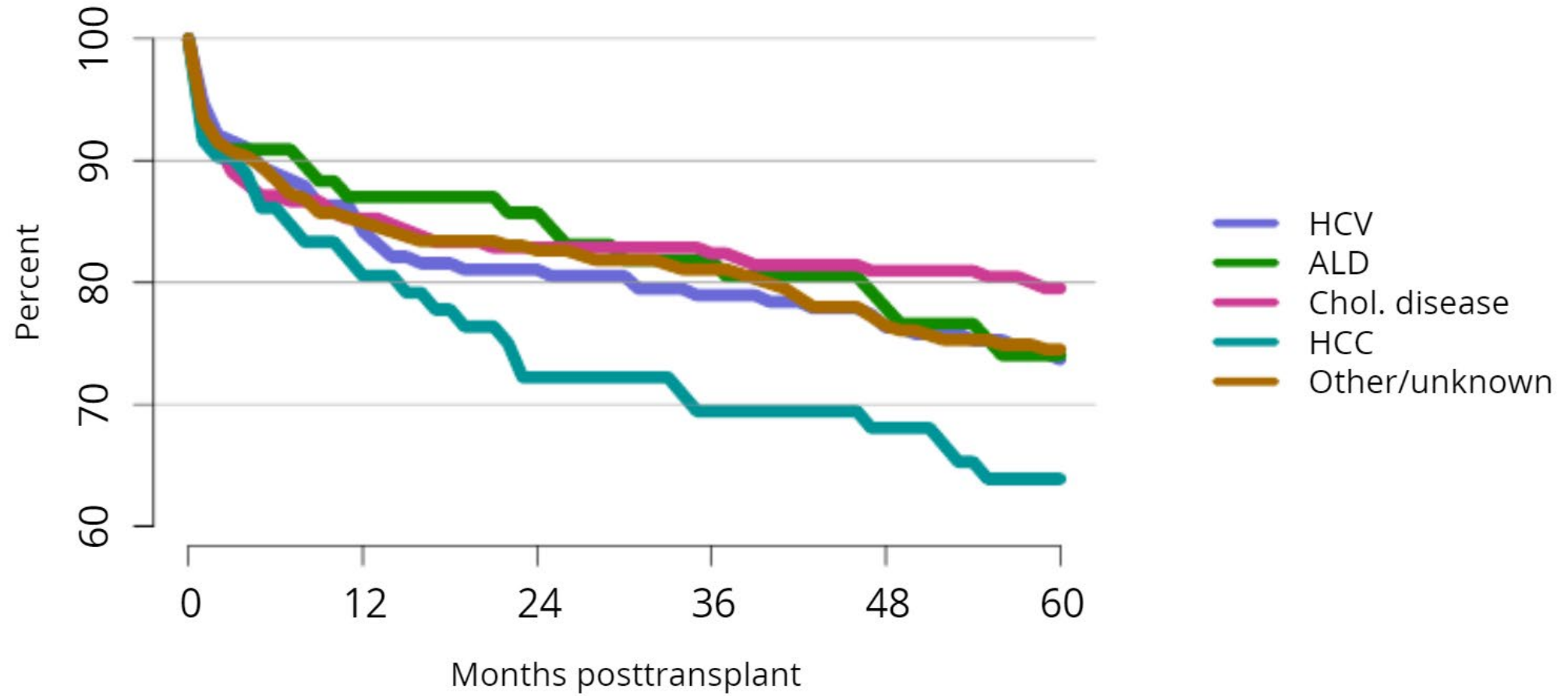
Survival depends on age at transplant



Survival depends on MELD at transplant

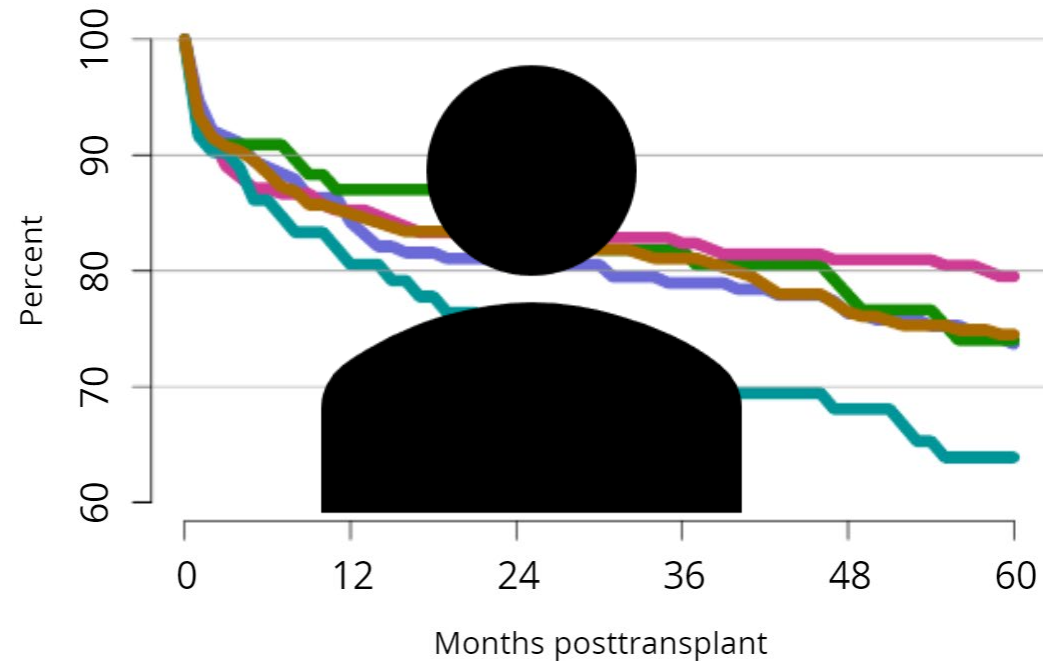


Graft survival depends on etiology



We can predict overall post-transplant survival

- MELD
- Age
- Multiorgan transplant
- HCC
- Weight, sarcopenia
- Depression
- Opioid prescription



Kwong et al. (2018) OPTN/SRTR Annual Data Report: Liver
Rogal et al. (2016) PlosOne; Rogal et al. (2013) AJT
Englesbey et al. (2010) Journal of the Am. College of Surgeons
Randall et al. (2017) Liver Transplantation

However, factors associated with post-transplant function have been less well established

- Transplants Cure

- Bleeding
- Ascites
- Liver cancer (sometimes)
- Metabolic diseases



- Transplants don't cure

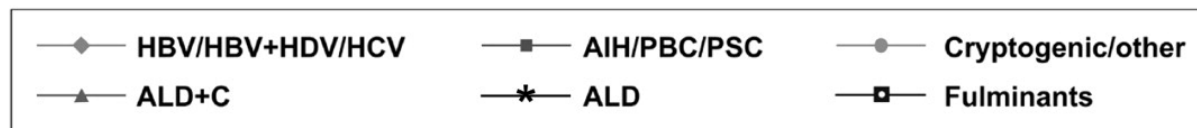
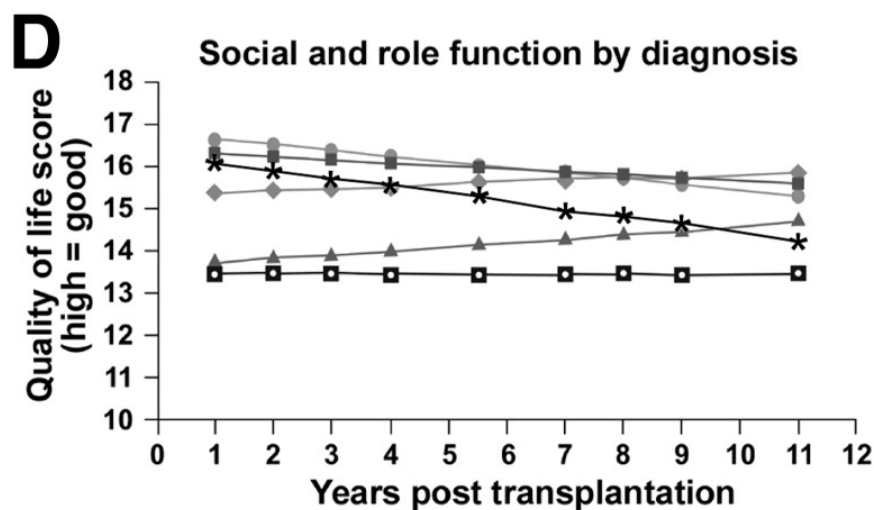
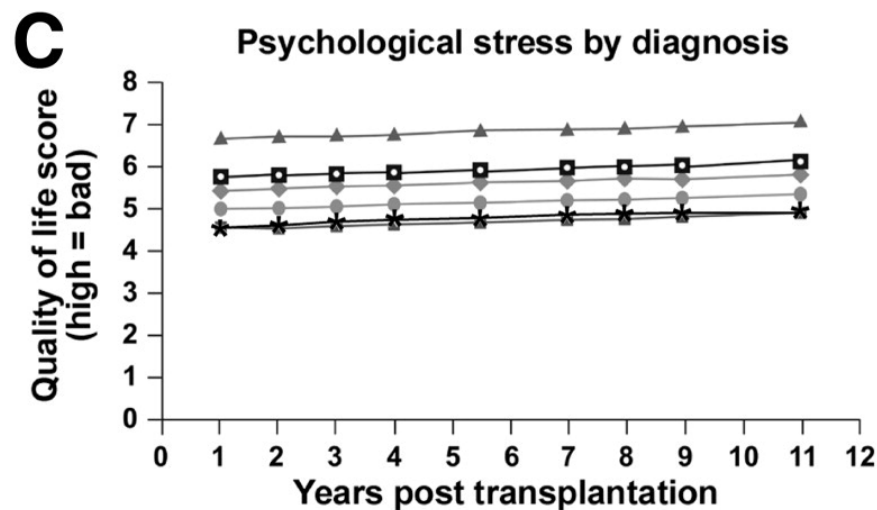
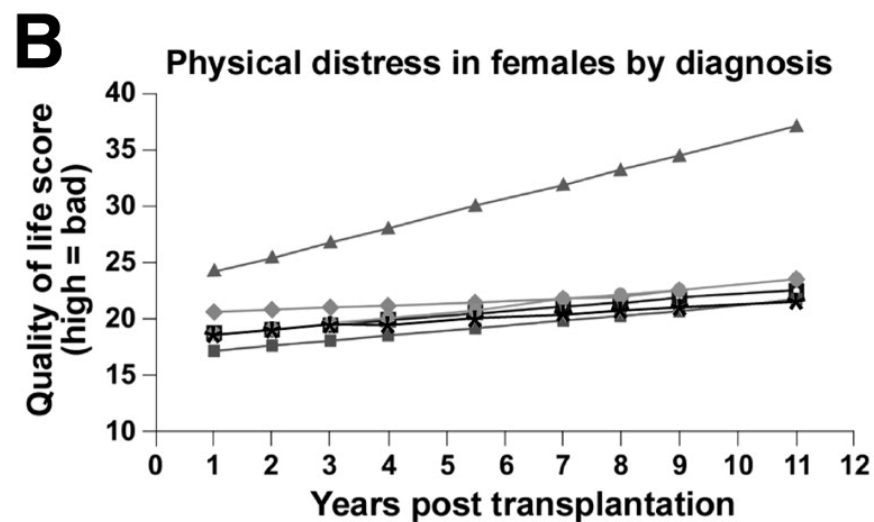
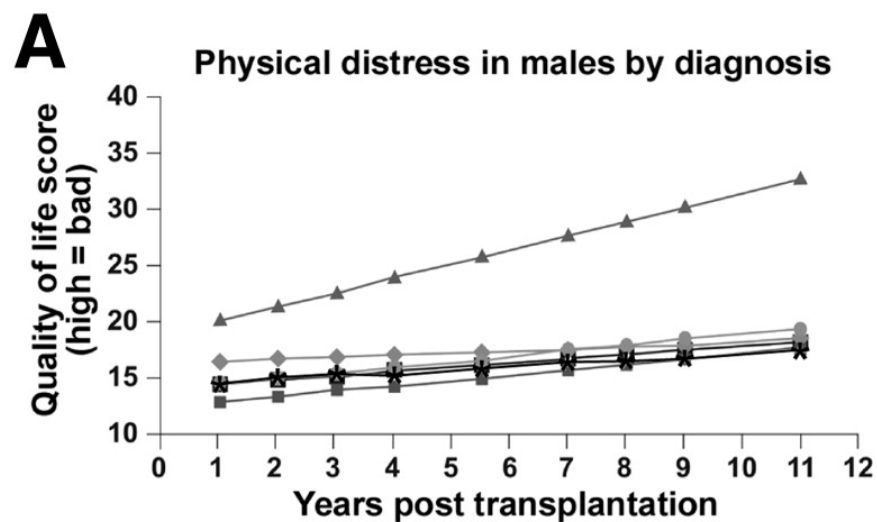
- Depression
- Anxiety
- Financial problems
- Alcohol use disorder
- Substance use disorder
- Chronic pain
- Obesity
- Diabetes

Functional status often remains poor 1-year post-transplant

- 77% limitations in vigorous activity
- 57% limited in the kind and amount of work they performed
- 36% prevented from attending work/school.
- 35% difficulty with stairs
- No improvement over 12 years of followup



Ruppert et al. (2010)
Gastroenterology



Summary

- Liver disease and transplantation are increasing in the US
- People with liver disease often have many other health issues that are not cured by transplant
- Survival is good but function can be poor
- \uparrow MELD at transplant + \uparrow survival time = more functional impairment post transplant