

# Changing Landscape of Liver Transplantation in the Post-DAA and Contemporary ART Era

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## Background

- Hepatitis C virus (HCV) and HIV coinfection is associated with 23-fold higher risk of progression of hepatocellular carcinoma and 6-fold higher risk of progression to end-stage liver disease, compared to HCV infection alone.
- HIV infection is reported to be an independent predictor of mortality in HCV-positive liver transplant recipients.
- Post-transplant, HIV-HCV coinfecting recipients have inferior survival rates, largely secondary to hepatitis C recurrence and associated mortality and graft failure.
- Combination antiretroviral therapy (ART) has improved outcomes of solid organ transplantation in persons living with human immunodeficiency virus (PLWH).
- Outcomes in HIV-HCV coinfecting transplant recipients have not been evaluated in the current DAA era.

## Aims

- Evaluate 1-year patient mortality in liver transplant recipients stratified by HIV and HCV infection status compared to their uninfected counterparts since 2000.
- Evaluate risk factors associated with 1-year mortality in all liver transplant recipients undergoing transplantation after 2015 to reflect the changing trends of transplant outcomes in the current era of DAA therapy and combination antiretroviral therapy.

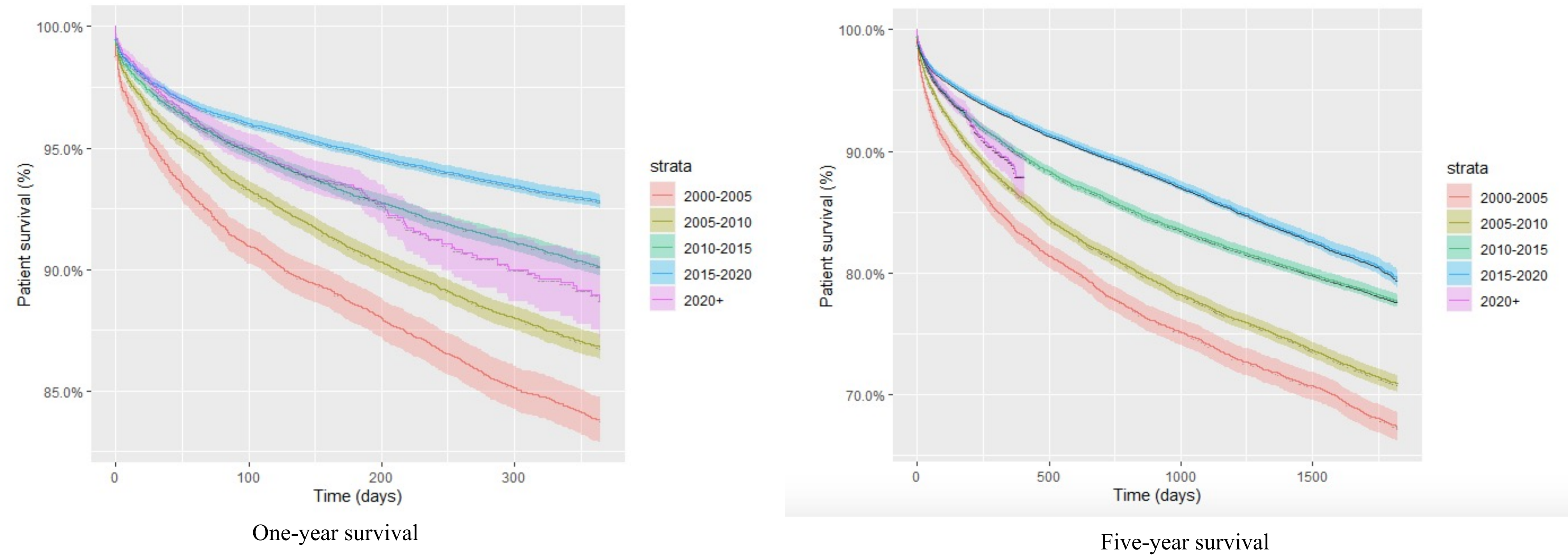
## Methods

- UNOS database was utilized to identify deceased donor liver transplant recipients between January 1, 2000 and September 30, 2020, and stratify them by HIV and HCV infection status.
- Kaplan-Meier curves, univariate and multi-variate logistic regression analyses were used for outcomes analysis and evaluation of risk factors.
- Inclusion criteria
  - Adult patients  $\geq$  18 years
  - Primary deceased donor liver transplantation
  - Documented pre-transplant HIV and HCV serologies
- Exclusion criteria:
  - Missing or unknown results of HIV and HCV serologies pre-transplant
  - Missing or incomplete 1-year follow-up data
  - Patients re-listed for transplant
  - Living-donor liver transplant

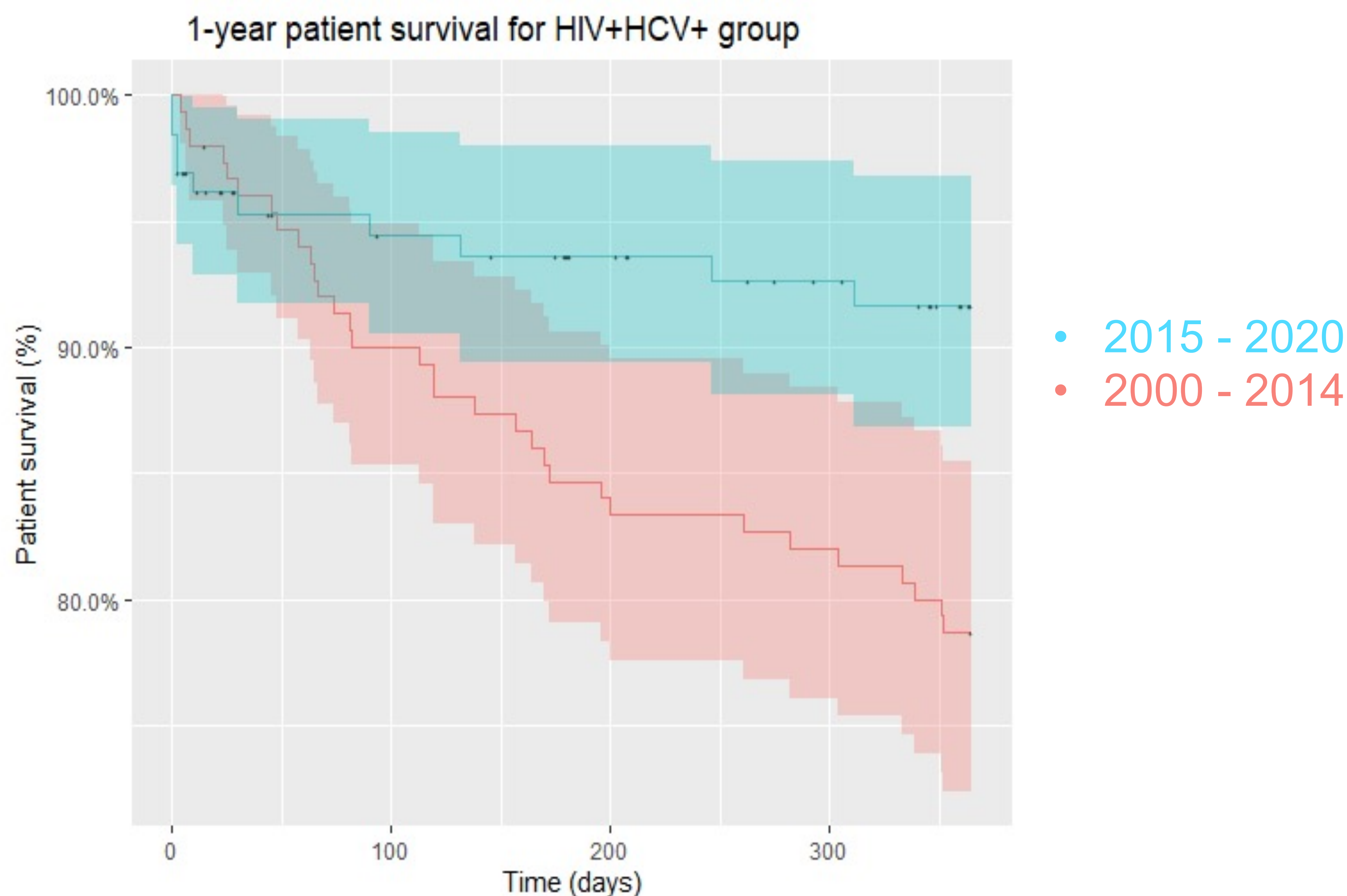


# Results

- A total of 85,730 persons were included in the study.
- One-year and 5-year patient survival improved (93% and 80%, respectively) for all liver transplants performed after 2015.



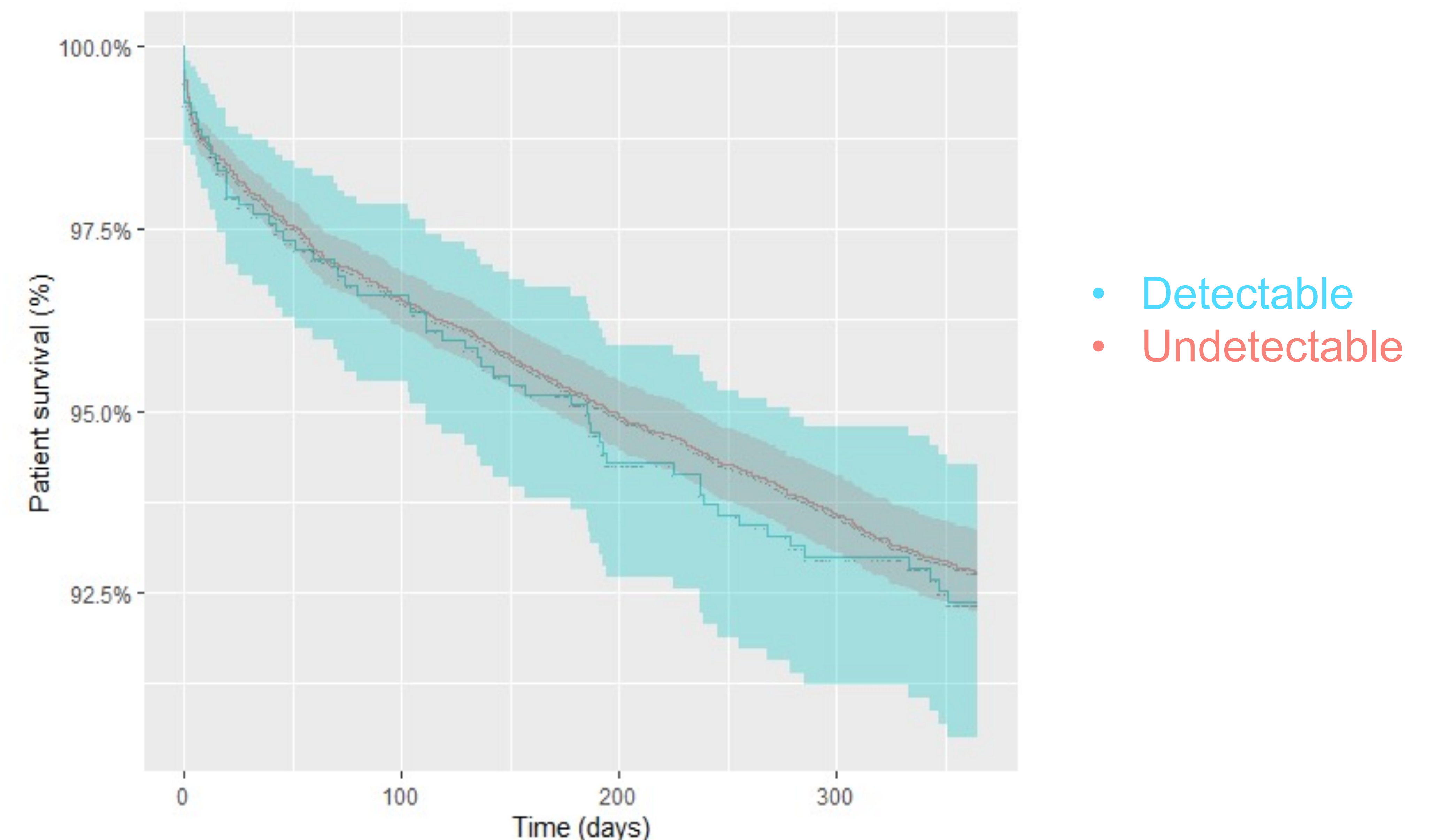
- For HIV/HCV coinfecting recipients, survival improved significantly from 78% (pre-2015) to 92% (post-2015). (Figure 2)



- Multivariate regression analyses identified advanced recipient age (OR 1.02, CI 1.01 – 1.02,  $p < 0.001$ ), black race (OR 1.34, CI 1.17 – 1.54,  $p < 0.001$ ), recipient diabetes mellitus (OR 1.18, CI 1.08 – 1.28,  $p < 0.001$ ) and decompensated cirrhosis as risk factors associated with higher one-year mortality.

Characteristic	OR	95% CI	p
Age	1.02	1.01 - 1.02	<0.001
Black Race	1.34	1.17 - 1.54	<0.001
Recipient Diabetes	1.18	1.08 - 1.28	<0.001
Donor Hypertension	1.05	0.96 - 1.15	0.3
Donor Diabetes	1.12	0.99 - 1.27	0.077
Ascites at time of transplant			
• Slight	1.07	0.95 - 1.20	0.3
• Moderate	1.08	0.96 - 1.23	0.2
Encephalopathy at transplant			
• grade 1-2	1.14	1.03 - 1.27	0.012
• grade 3-4	1.84	1.61 - 2.10	<0.001
TIPSS at transplant	1.1	0.97 - 1.24	0.14
Portal vein thrombosis	1.34	1.21 - 1.49	<0.001

- Detectable HCV viral load at transplant was not associated with poorer outcomes (OR 1.03, CI 0.77 – 1.35,  $p = 0.9$ ), and neither was presence of HIV/HCV coinfection at transplant (OR 1.1, CI 0.56 – 2.08,  $p = 0.7$ ).





## Conclusion

- Liver transplant outcomes in HIV/HCV coinfecting liver transplant recipients have significantly improved since 2015 in the setting of highly effective ART and DAA therapy. Presence of HIV, HCV and HIV/HCV coinfection do not render higher mortality risk in liver transplant recipients in the current post-DAA and cART era.
- HCV viremia at the time of transplant did not influence survival – hence it is safe to withhold HCV treatment until after transplant in order to avoid false-improvement in MELD score that can potentially delay transplantation (*MELD purgatory effect*).

Thank you!

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