

### Background

- Liver cancer is the 5th most common cancer worldwide with 90% of liver cancers being hepatocellular carcinoma (HCC) (1). The most common risk factor for HCC is cirrhosis, which is seen in 80% patients with HCC (2).
- While racial and income disparities have been studied, less is known about the impact of other social determinants of health (SDOH) on HCC outcomes
- We aimed to determine the associations between SDOH of patients diagnosed with HCC leading to lower overall survival and more advanced disease at presentation.

### Methods

- Performed a retrospective chart review from a REDCAP database of patients diagnosed with HCC at our tertiary care center from 2015 to 2019
- SDOH in our analysis - gender, race, body mass index (BMI), marital status, veteran status, highest education level achieved, insurance status, transportation method, surveillance status for HCC prior to diagnosis
- Outcome measures - overall survival time, BCLC (Barcelona Clinic Liver Cancer) stage, tumor size, and presence of metastasis at diagnosis. Using multiple imputation for missing data, multivariate analyses examined the outlined SDOH variables on the various HCC outcomes.

### Results

- Our cohort of 1655 patients is unique given the large number of patients (43.7%) with Medicare and Medicaid as primary insurers.
- Overall survival in our cohort was 48.5% at 3 years and 37.3% at 5 years, matching national outcomes (Figure 1).
- Patients who received surveillance prior to HCC diagnosis (HR 0.73,  $p < 0.001$ ), were married (HR 0.82,  $p = 0.005$ ) and qualified for first-line HCC treatment (HR 0.46,  $p < 0.001$ ) were associated with better overall survival.
- Patients who were female (HR 0.76,  $p = 0.032$ ), married (HR 0.79,  $p = 0.044$ ), and had routine imaging surveillance for HCC prior to diagnosis (HR 0.75,  $p = 0.019$ ) were less likely to have an HCC lesion  $> 5$  cm at time of diagnosis.
- At time of diagnosis, comparing to patients with Medicare/Medicaid, patients with private insurance were more likely to have metastatic HCC (HR 3.43,  $p < 0.001$ ) and uninsured patients were less likely to have metastatic HCC (HR 0.34,  $p = 0.037$ ).

### Results (continued)

**Table 1. Frequency of Patient Characteristics**

Characteristics	N (%)
<b>Gender</b>	
Female	495 (26.5%)
Male	1217 (73.5%)
<b>Race</b>	
Non-White	582 (35.2%)
White	1073 (64.8%)
<b>BMI<sup>a</sup></b>	
<30	897 (54.2%)
>30	495 (29.9%)
<b>Married (yes)<sup>b</sup></b>	
	887 (53.6%)
<b>Veteran (yes)<sup>c</sup></b>	
	6.82%
<b>Educational Status</b>	
Less than high school	11.5%
High school graduate	30.2%
Some college/Associates	33.4%
Bachelors or more	24.9%
<b>Insurance</b>	
None	41 (2.5%)
Private	890 (53.8%)
Medicare/Medicaid	724 (43.7%)
<b>Transportation to work</b>	
Car	90.7%
Bicycle	0.353%
Public	2.17%
Taxi	1.03%
Home	3.76%
Walked	1.95%
<b>HCC Surveillance (yes)<sup>d</sup></b>	
	1036 (62.6%)

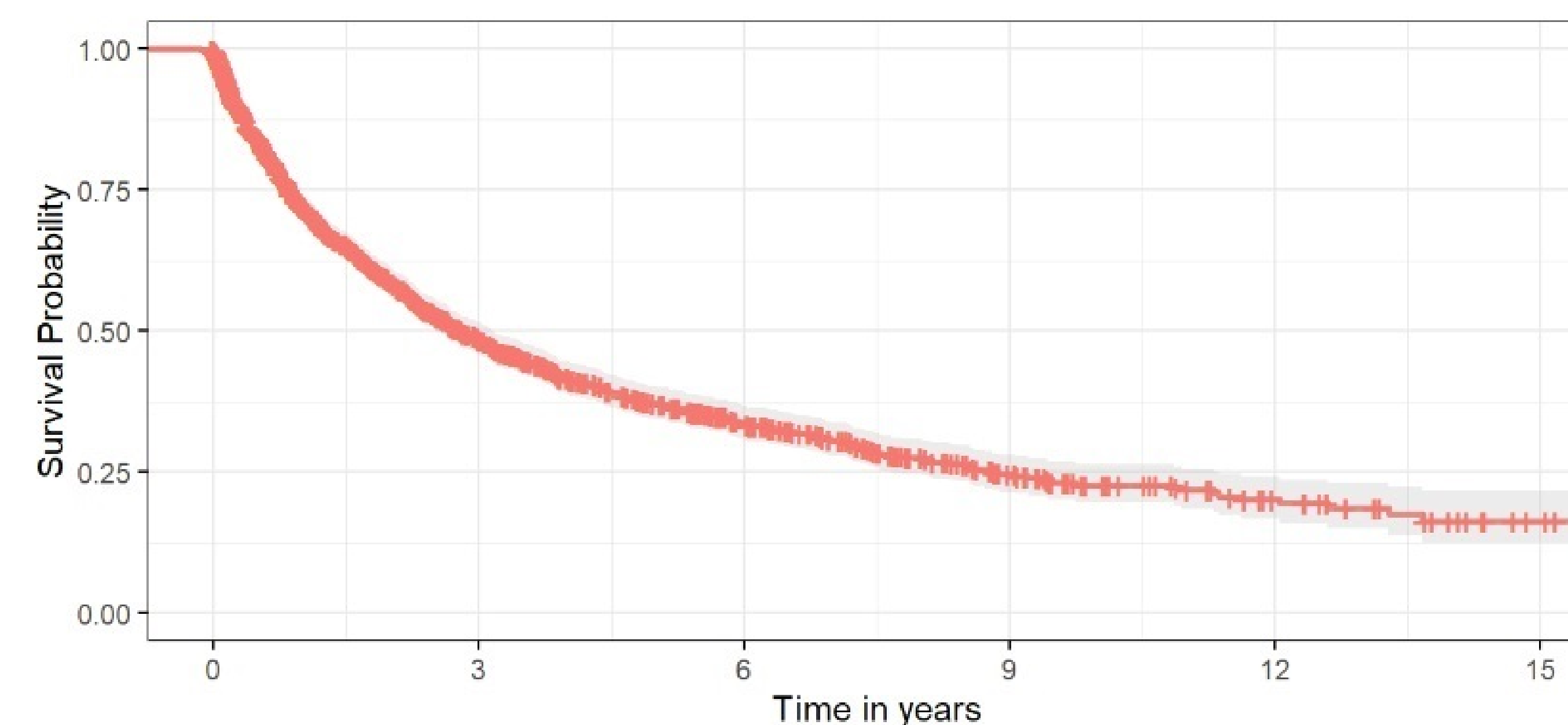
<sup>a</sup>BMI missing n=263 (15.9%)

<sup>b</sup>Marital status missing n=20 (1.2%)

<sup>c</sup>Veteran status, Education status, Transportation were 2019 ACS 5-year estimate at ZCTA5 level rather than individual data from database

<sup>d</sup>Under routine HCC surveillance missing n=8 (0.5%)

**Figure 1. Kaplan-Meier Curve of Overall Survival**



### Discussion

- Gender, marital status, and HCC surveillance prior to diagnosis were associated with improved overall survival and earlier HCC diagnosis. Marital status has been associated with a better prognosis in multiple cancers. This may be due to more financial resources, and social and emotional support available to married HCC patients (3).
- Our data further supports studies that have shown women have a better survival rate. Our study suggests there may be other social and biologic factors contributing to women having less advanced disease on presentation (4,5).
- Previous studies note that uninsured patients are at a higher risk of death (6). Our study finding of patients with private insurance being more likely to have metastatic HCC at the time of diagnosis may be explained by the fact that we are a safety net hospital and many of our patients may potentially present for second opinions at more advanced stages.

### Conclusion

- Our study's findings emphasize the importance of encouraging screening for HCC in patients with cirrhosis. This is especially true in patients with more socioeconomic risk factors such as unmarried male patients.
- As a future direction we plan to enhance our database by integrating zip code data to area deprivation indices (ADI) for patients as an additional measure of socioeconomic status.

### References

