Geographic, linguistic, and cultural factors are associated with clinical presentation, receipt of treatment, and survival of patients with hepatocellular carcinoma

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INTRODUCTION

- Hepatocellular carcinoma (HCC) is the second most common cause of cancer-related mortality *[Bray et'al 2018, WHO, 2018]*.
- Surveillance and early detection and curative treatment of HCC are the mainstay of improving survival *[Singal et'al 2014, Golabi et'al, 2017]*.
- Patients experience several challenges of receiving care including remoteness of residence and language barriers.
- Many patients live in regional parts of Australia and may have lower rates of screening surveillance and treatment uptake for HCC, and may present with advanced stage of HCC *[Clark et' al 2015, Wong et'al 2020]*.

AIM

To investigate the impact of migration, area of residence, preferred language, and tumor stage on receiving treatment and survival time in migrants born in Africa, Middle East, or Asian regions.

METHOD

Study design and cohort:

- A retrospective cohort study of adults with HCC from 1 January 2007 to 31 December 2016.
- Data for 1651 HCC patients were obtained from the Queensland Cancer Registry, Queensland Hospitals Admitted Patient Data Collection (QHAPDC), and Queensland Death Registry **[Figure 1].**
- Two- sample Wilcoxon rank-sum test was used to compare the age at the time of diagnosis of HCC.
- Attributable fraction – to estimate contribution of risk factors on liver resection and transplant listing
- Weibull survival- to compare probability of survival by risk factors
- Bayesian Weibull AFT regression – to identify predictors of time to death

RESULTS

Cohort characteristics

- 1651 adults followed for average 10 years and produced 28,018 person-months of follow-up
- Nearly half (41.5%) lived in rural or remote areas
- About one-third primarily speak non-English languages
- Median age at diagnosis of HCC 65.6 Years (IQR 57.0–75.0)
- Liver transplantation attributable to chronic HCV: 850 liver transplants per 1000 chronic HCV positive HCC patients (95% CI 0.67–0.93).
- Liver resection attributable to alcoholic liver disease: 520 resections per 1000 HCC patients with alcoholic liver disease (95% CI 0.34–0.65)

Receipt of treatment for HCC

- Patients from rural and remote areas were significantly less likely to receive surgical resection for the treatment of HCC compared with patients living in metropolitan areas (9 *vs* 13%, *P* = 0.021).

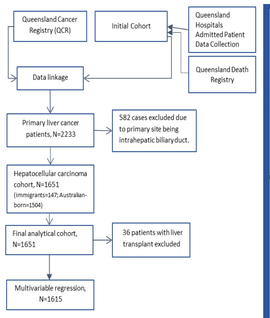

Figure 1 Study participant selection flowchart. Three data sources—Queensland cancer registry (QCR), Queensland Hospital Admitted Patient Data Collection, and Queensland Death Registry were used to obtain 2233 liver cancer patients and 1615 hepatocellular carcinoma cases were analyzed.

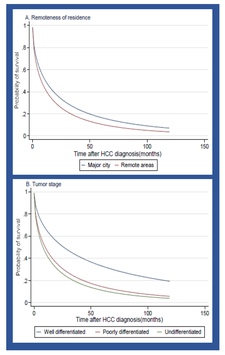

Figure 2 Weibull survival curves for patients with hepatocellular carcinoma (HCC) by remoteness of residence(a) and tumour stage at the time of HCC diagnosis.

Survival

- Median survival after HCC diagnosis was 9.0 months (IQR 2.0 -24.0)
- Patients with HCC who presented with well-differentiated tumor had a significantly better probability of 12-month (55.9% vs 45.4%)**[Figure 2]**
- Living in remote areas was associated with 33% reduced survival compared with major city residence
- Presence of ≥1 comorbidity reduced survival time by 30% (TR =0.69 95%CrI 0.54–0.90) **[Table 1]**

Table: Predictors of time-to-death for migrants and other Australian patients with hepatocellular carcinoma, 2007–2016

Predictor	Median survival months (IQR)	Time ratio	95% credible interval
Sex			
Male (vs female)	9.9 (2.0–25.0)	1.03	0.82–1.26
Age at diagnosis of HCC (vs <60 years)			
60–69 years	9.9 (2.9–25.0)	0.72	0.56–0.95
≥70 years	6.1 (1.9–18.4)	0.42	0.34–0.53
Country of birth			
Australian/America/Europe born (vs migrants)	8.1 (2.0–23.0)	0.76	0.49–1.06
Remoteness of residence			
Outside major city (vs major city)	7.0 (2.0–24.0)	0.67	0.55–0.80
Preferred language (vs English)			
Other language	8.1 (2.0–23.0)	1.56	1.26–2.00
SEIFA (vs most affluent)			
Q2	9.7 (2.0–26.0)	0.91	0.60–1.34
Q3	11.0 (2.9–24.9)	1.13	0.77–1.62
Q4	8.0 (2.0–24.5)	0.93	0.63–1.39
Q5 (most disadvantaged)	8.1 (2.0–23.0)	0.96	0.75–1.24
Charlson Comorbidity Index			
≥1 comorbidity (vs none)	8.0 (2.0–23.0)	0.69	0.54–0.90
Type of HCC			
Recurrent HCC (vs no recurrence)	6.0 (2.0–19.1)	0.60	0.46–0.77
Tumor stage at presentation (vs differentiated)			
Poorly differentiated	10.5 (2.0–25.0)	0.42	0.27–0.60
Undifferentiated	7.0 (2.0–21.0)	0.30	0.23–0.39

CONCLUSIONS

- Patients who lived in rural and remote areas, presented with advanced tumor stage, and older age had poorer survival.
- Patients from rural areas were less likely to receive treatment for HCC
- Migrants proportionally presented with earlier-stage HCC, probably related to the non-cirrhotic HBV infection, and lower etiological contribution from alcohol.
- Our findings highlight the significance of screening for viral hepatitis, conducting HCC surveillance in at-risk patients such as those with cirrhosis and residing in remote areas, and timely curative treatment to improving survival in these patients.

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