has had an unprecedented impact on healthcare services. The pandemic has seen dramatic reductions in early cancer referrals, delayed treatment and the suspension of cancer surveillance programmes.

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‘Prioritising cancer surveillance in chronic hepatitis B in the COVID-19 era. Time to stop and think?’

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Introduction

- Hepatitis B is the leading cause of hepatocellular carcinoma (HCC) globally.
- Guidance at the onset of the *Sars-cov2* virus pandemic recommended the deferral of HCC surveillance. However the implications on liver cancer care are now emerging and the need for reorganisation of services is becoming urgent.

Methods

- We investigated how five HCC risk prediction scores could aid stratification of patients with chronic HBV (**Table 1**).
- HCC scores were calculated using parameters from three years prior to the cancer diagnosis. We compared the number of patients requiring cancer surveillance according to each score and regional surveillance guidance.

	GAG HCC score	REACH B score	Modified REACH B score	Modified PAGE B score	aMAP score
Reference	Yuen et al 2009	Yang el al 2011	Lee et al 2014	Kim et al 2018	Fan et al 2020
Score Parameters	Sum of: • Age (years) • Gender • HBV Viral load • Cirrhosis	Sum of: • Age (years) • Gender • ALT (U/L) • HBV DNA viral load HBeAg +ve	Sum of: • Age (years) • Gender • ALT (U/L) • Liver fibrosis (kPa) • HBeAg +ve	Sum of: • Age (years) • Gender • Platelet count(10*9/L) • Albumin	Algorithm based on • Age (years) • Gender • Platelet count (10*9/L) • ALBI score
Optimal score for low cancer risk	**<82**	**<8**	**<10**	**≤8**	**<50**

Table 1: Summary of HCC risk prediction scores

	HCC n=17	Controls n=17	P value
Age in years (Mean ± SD)	56.59 ±11.97	55.35 ±10.47	0.75
Gender n (%)			
M	15 (88.24%)	15 (88.24%)	>0.99
F	2 (11.76%)	2 (11.86%)	
BMI in kg/m^2 (Median, IQR)	25 (22, 27.50)	25 (23.50,27)	0.88
Ethnicity n (%)			
Asian	8 (47.06%)	11 (64.70%)	
Caucasian	7(41.18%)	3 (17.65%)	0.65
Afro-Caribbean	2 (11.76%)	3 (17.65%)	
Mixed/other	0(0%)	0 (0%)	
Liver disease fibrosis stage n (%)			
Cirrhosis	11 (64.71%)	3 (17.65%)	
Severe fibrosis	0 (0%)	0 (0%)	
Moderate fibrosis	1 (5.88%)	1 (5.88%)	
Mild fibrosis	5 (29.41%)	3 (17.65%)	
No fibrosis	0 (0%)	10 (58.82%)	
Child-Pugh Score (if cirrhotic, n=35)			
A	6 (54.55%)	3 (100%)	
B	4(36.36%)	0 (0%)	
C	1 (9.09%)	0 (0%)	
HBeAg positive n(%)	3 (17.65%)	1 (5.88%)	0.29
HBV DNA (IU/ml) (Median, IQR)	6 (0, 1415)	180 (17,117400)	0.08
Platelets (10*9/L) (Median, IQR)	132 (66.50, 174.50)	207 (171.50, 305)	**0.0001**
Albumin (g/L) (Median, IQR)	38 (34, 42.50)	42 (40, 43)	**0.02**

Table 1: Baseline characteristics of study participants

Results

- The control HBV group was matched to the HCC group for age, gender, BMI and ethnicity (**Table 2**).
- The aMAP score had the highest discriminatory performance in HCC risk prediction at three years, followed by the mREACH B score, and mPAGE B score. However, only the mREACH B score had a negative predictive value (NPV) >99% (**Figure 1 & 2**)

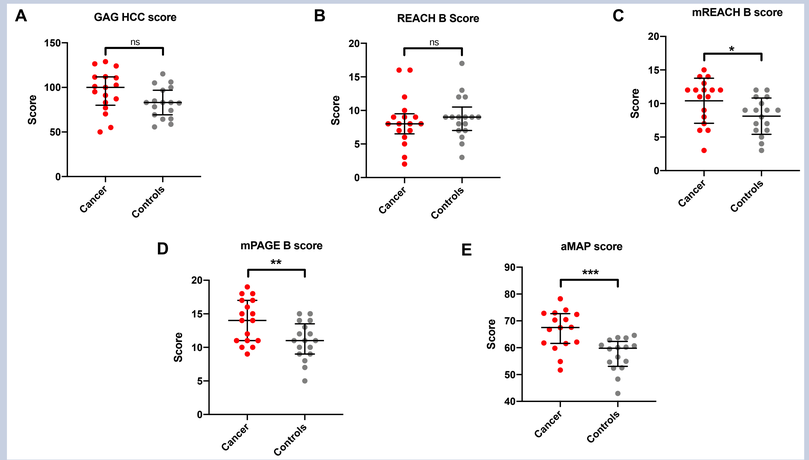

Figure 1: HCC risk scores calculated using parameters 3 years prior to HCC

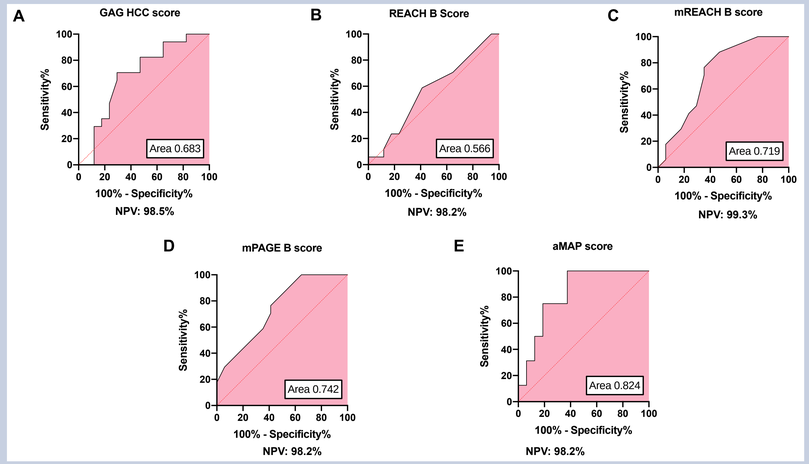

Figure 2: Area under the Receiver-operating characteristic curve (auROC) for discriminative performance of each HCC risk score using parameters 3 years prior to HCC diagnosis to differentiate diagnosis of HCC from HBV controls.

- Regression analysis showed that the risk of HCC was highest for those with cirrhosis and in those with an AFP > 7 k/UL (**Table 3**).

Variable	Category	Log (OR)	P value <0.05
Age (years)		0.065	0.321
Gender	Female	(reference)	
	Male	0.078	0.965
BMI (kg/m^2)		-0.206	0.188
Ethnicity	Caucasian	(reference)	
	Asian	0.917	0.524
	Afro-Caribbean	-3.255	0.190
Liver fibrosis[a]		1.947	**0.003**
AFP (kU/l)[b]		3.978	**0.002**
HBV DNA Log10		0.228	0.460
Platelets (10*9/L)		-0.007	0.363
Albumin (g/L)		0.039	0.814

Table 3. Multi-level Logistic regression with all covariates (AFP and liver fibrosis categorised)

- Applying the mREACH B score to our HBV cohort identified 11 patients requiring HCC surveillance, compared with 62 under current guidelines (**Figure 3A**).
- Reducing the threshold resulted in more patients requiring surveillance, but did not affect the NPV (**Figure 3B**).

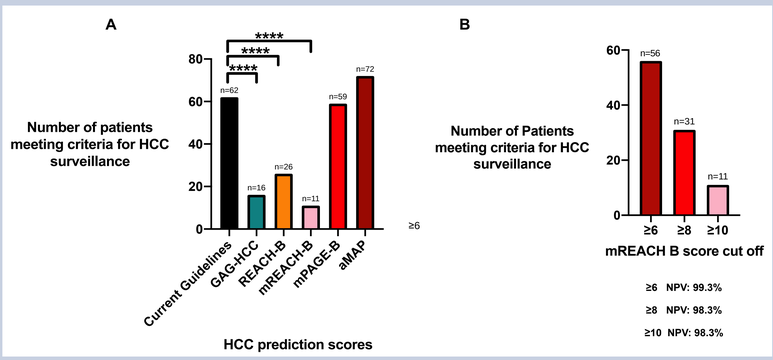

Figure 3:
A) Number of patients requiring HCC surveillance according to each HCC risk score and current local guidelines
B) Number of patients requiring HCC surveillance according to the mREACH B score after using three cut-offs.

Conclusion

The use of HCC risk prediction scores could streamline the surveillance of patients with chronic HBV, at a time of extremely limited resources. Overall, the mREACH B score had both a strong discriminatory performance and a high NPV, thus safely identifying low risk patients not requiring surveillance.