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HKU Med School of Clinical Medicine
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肝病研究國家重點實驗室
State Key Laboratory of Liver Research
The University of Hong Kong

The Westmead Institute
FOR MEDICAL RESEARCH

Queen Mary University of London

Why HCC? Why Now?

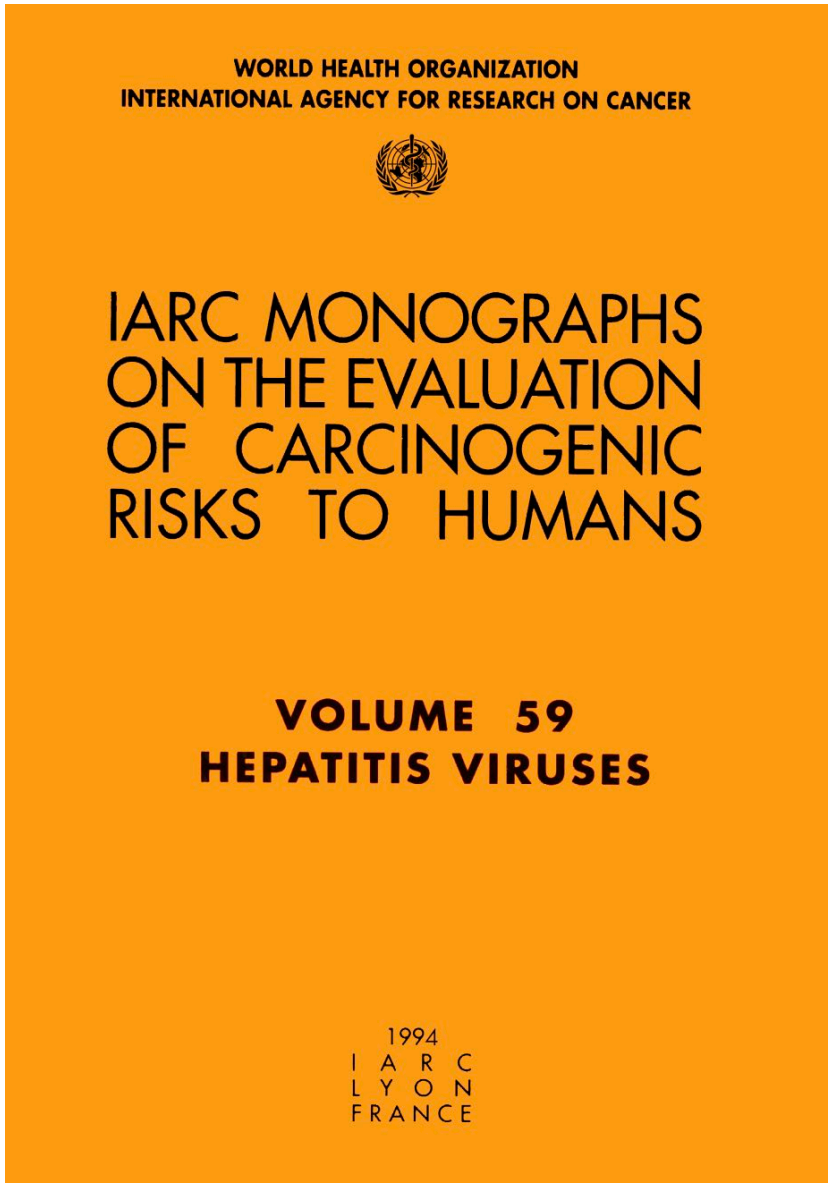
Dr. Mak Lung-Yi, Loey

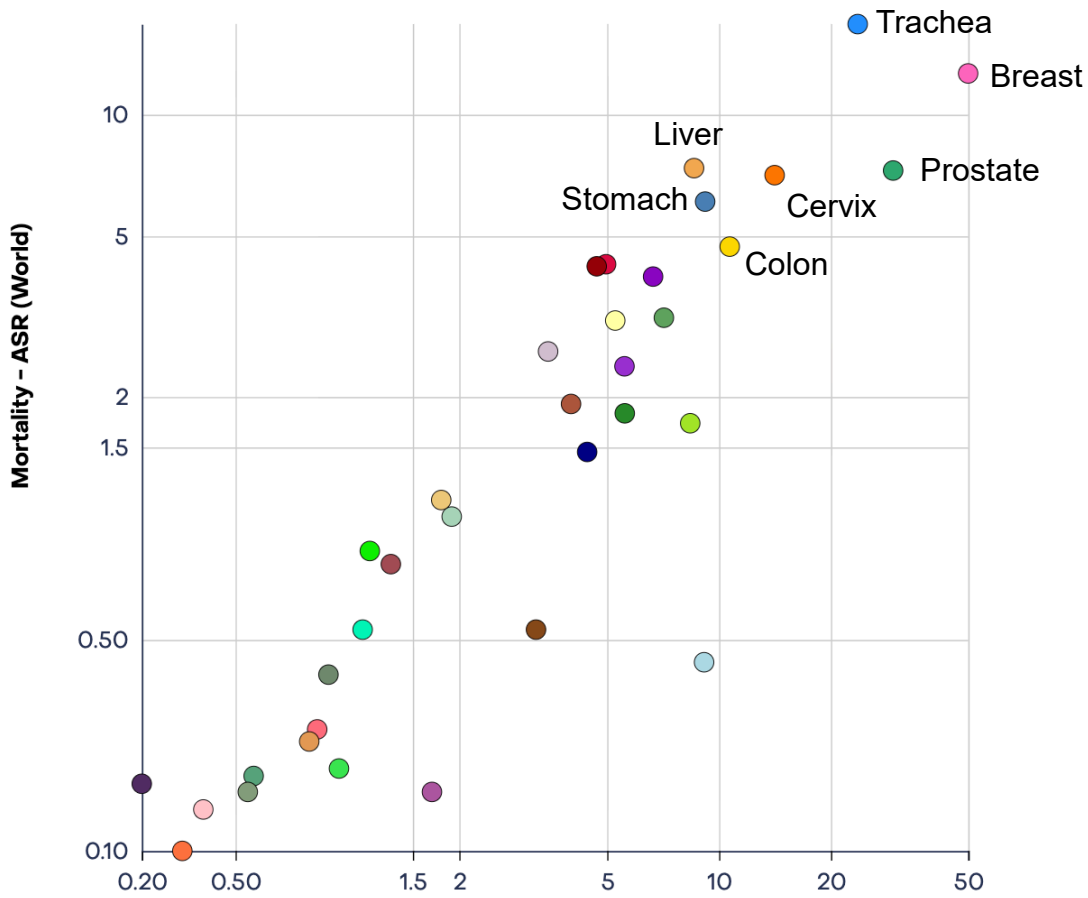
MD, FRCP

Co-Chair
HBV Working Group, HBV Forum 15

Clinical Assistant Professor, Specialist in Gastroenterology & Hepatology, Principal Investigator
The LKS Faculty of Medicine, Queen Mary Hospital, State Key Laboratory of Liver Research; The University of Hong Kong
Honorary Research Fellow
Centre for Immunobiology, Blizard Institute, Barts and The London SMD, Queen Mary University of London, UK
Visiting Scholar
Westmead Institute for Medical Research, The University of Sydney, Australia

Lo Ying Shek Chi Wai Foundation Scholar | Croucher Scholar | EASL Emerging Leader

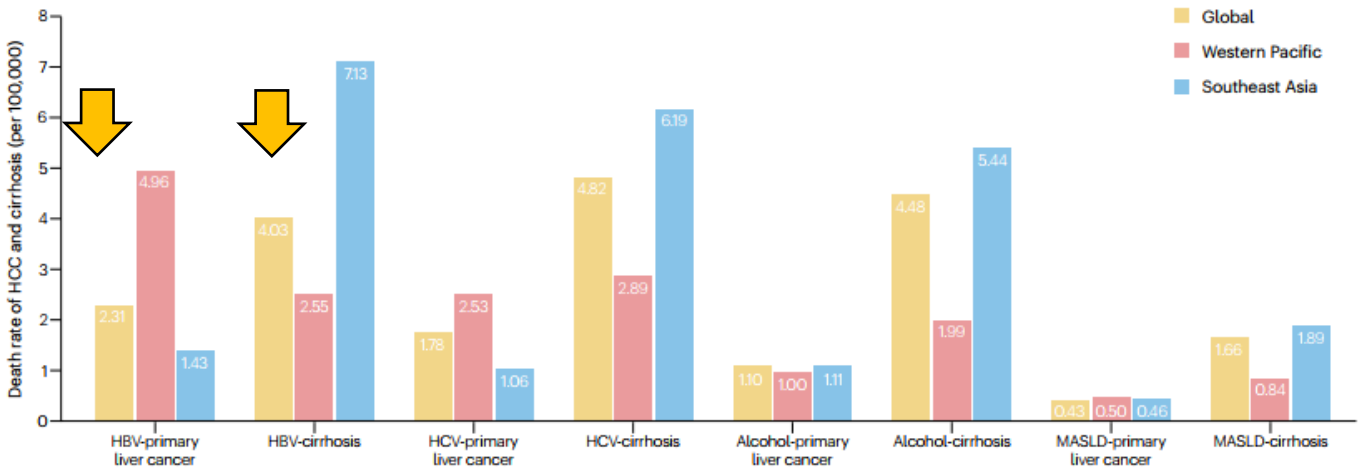


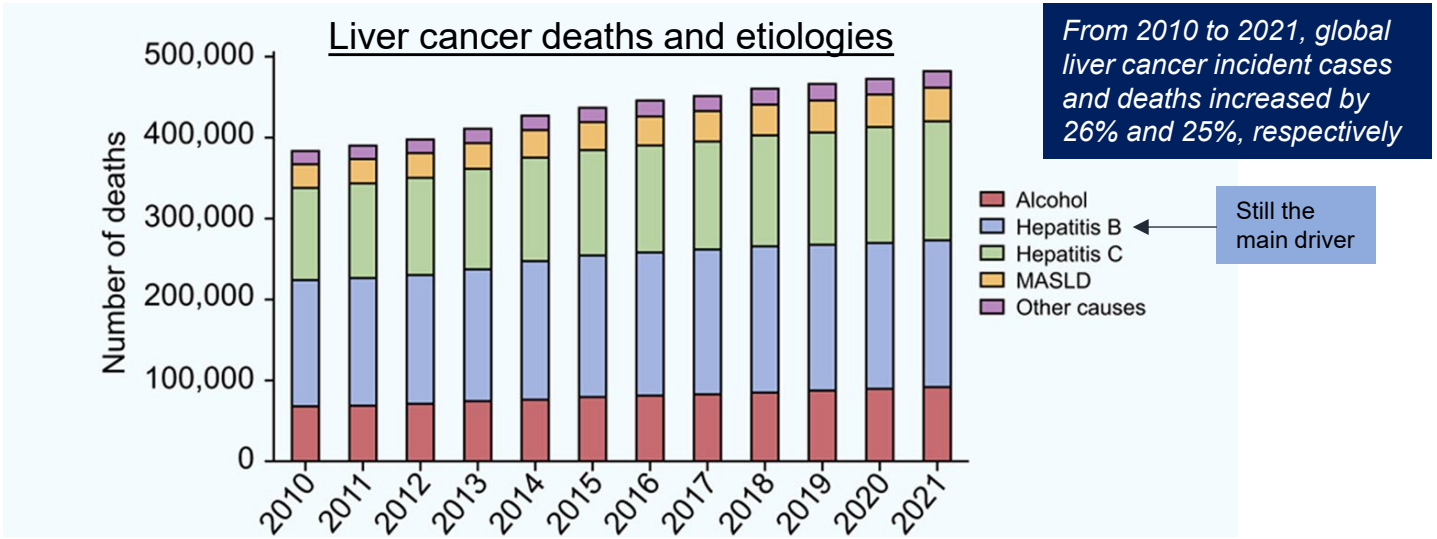


The International Agency for Research on Cancer (IARC) classified hepatitis B (and C, D) as **carcinogenic**

Infographic source: IARC, WHO 2025

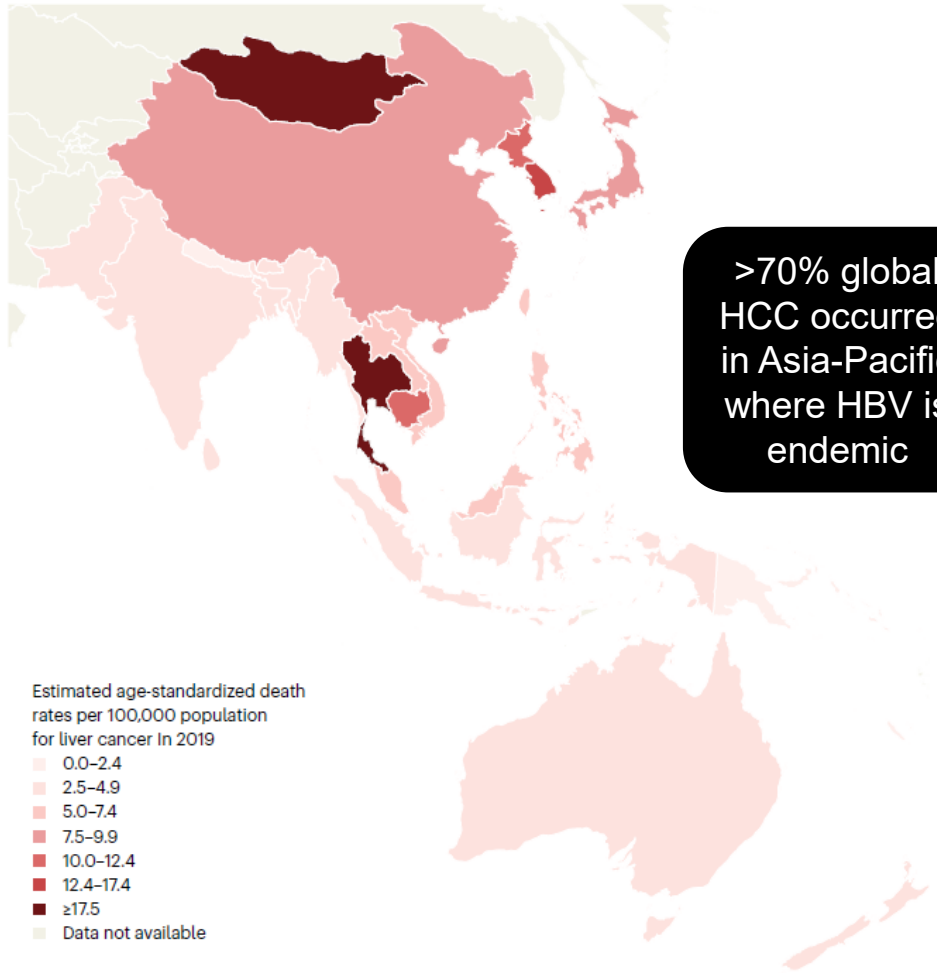
Growing number of HCC-related deaths globally
HBV is the leading etiology





From 2010 to 2021, global liver cancer incident cases and deaths increased by 26% and 25%, respectively

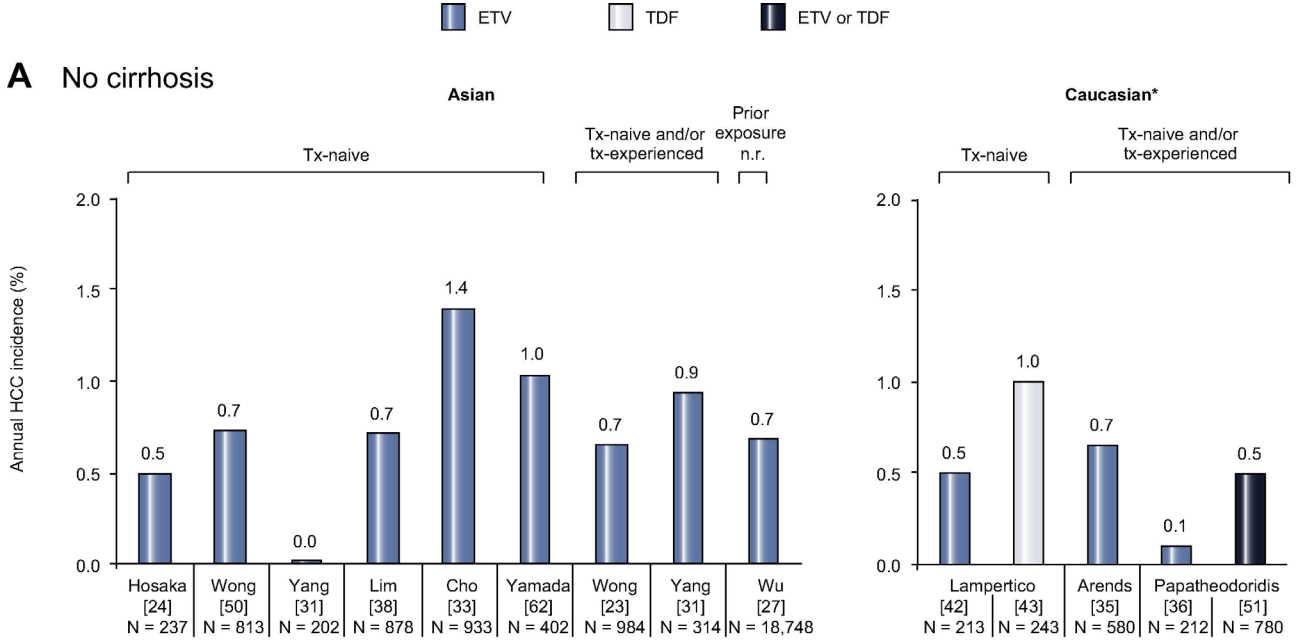
Still the main driver

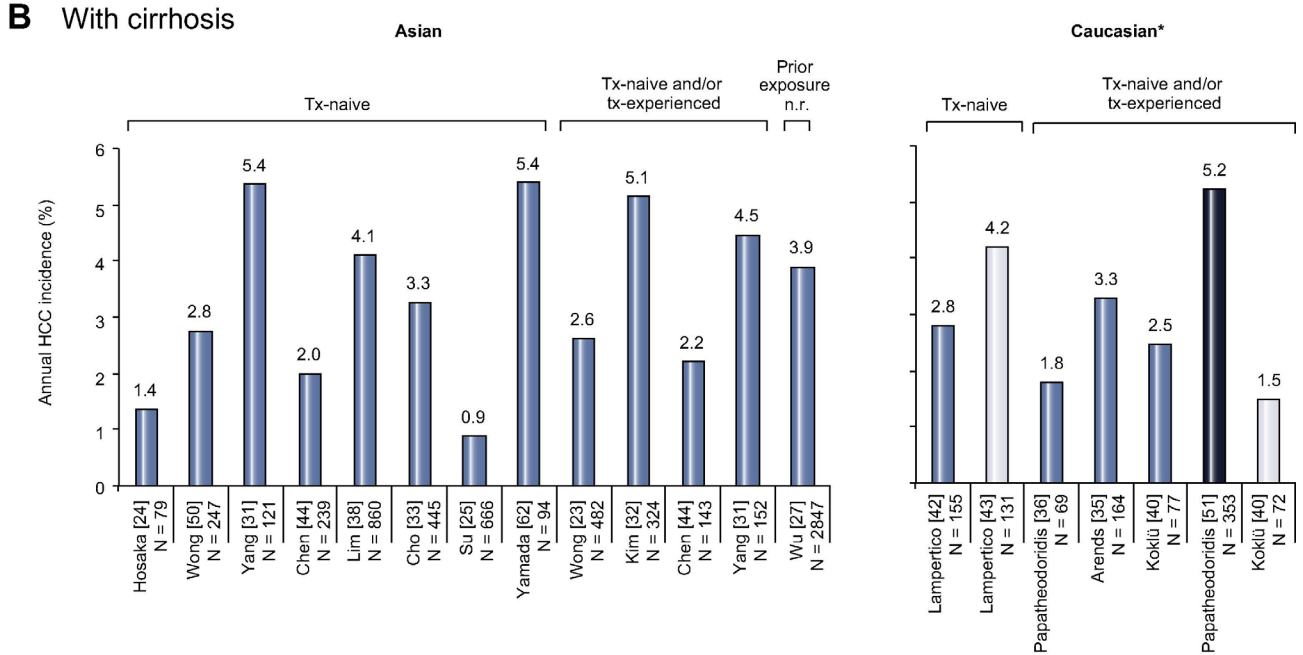


>70% global HCC occurred in Asia-Pacific where HBV is endemic

Tan EY, et al. Journal of Hepatology 2025

Mak, et al. Nature Reviews Gastroenterology and Hepatology 2024





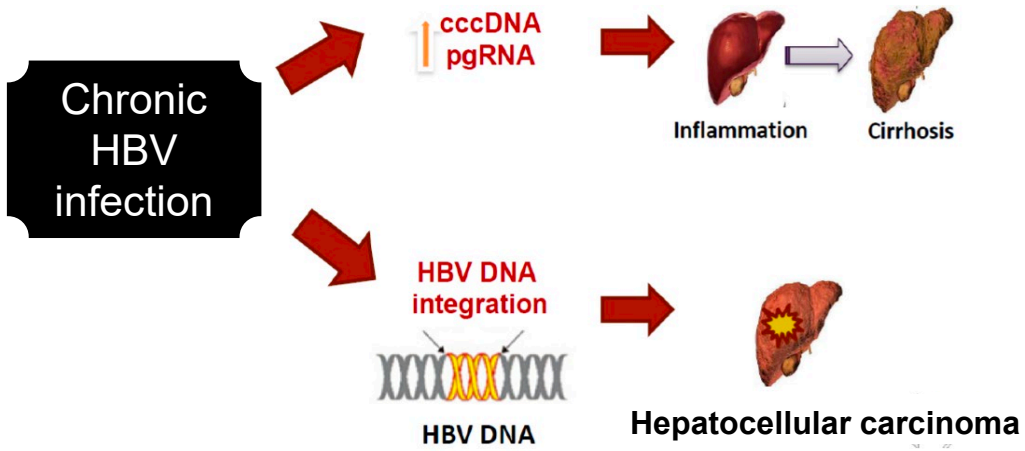
Current NA therapy consistently resulted in a significantly lower HCC incidence

~30% reduction in patients with cirrhosis

~80% reduction in patients without cirrhosis

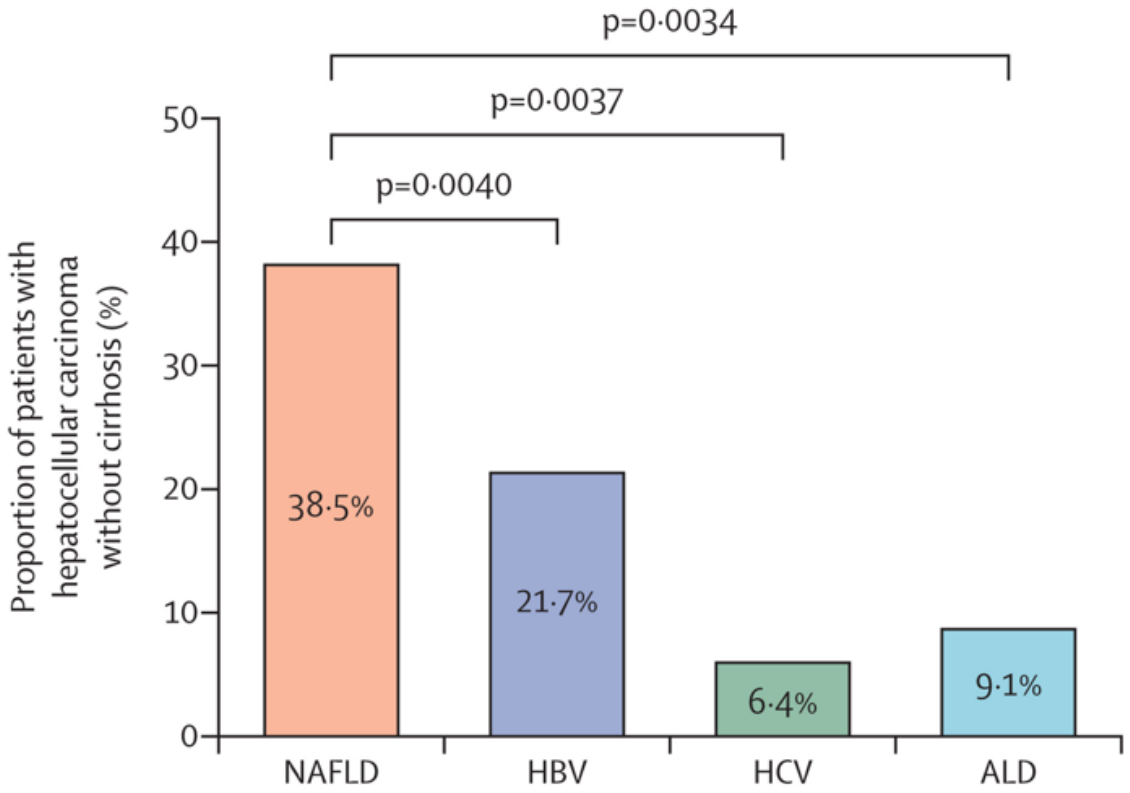
BUT NOT ELIMINATE

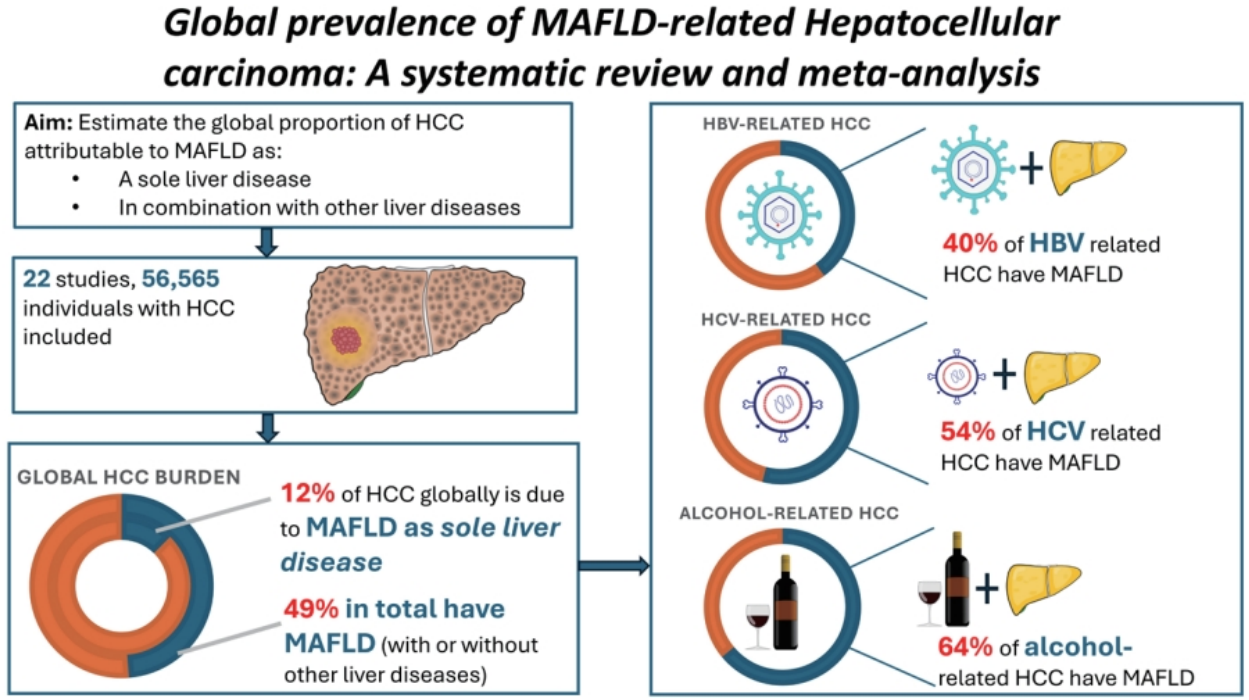
Papatheodoridis GV, et al. Journal of Hepatology 2015



HBV treatment guideline update:
WHO (2024), EASL (2025), AASLD (soon)

Many HCCs develop in non-cirrhotic livers





Are traditional risk factors/ scores enough to identify high-risk patients?
What can we do to detect early HCC?

Tan DJH, et al. *Lancet Oncol.* 2022

Crane H et al. Clin Mol Hepatol. 2024 Jul;30(3):436-448.

International guidelines for HCC surveillance

	Europe	USA	Asia Pacific	China
Ultrasound	✓	✓	✓	✓
AFP		Mentioned	✓	✓
PIVKA-II			Mentioned	✓

Populations

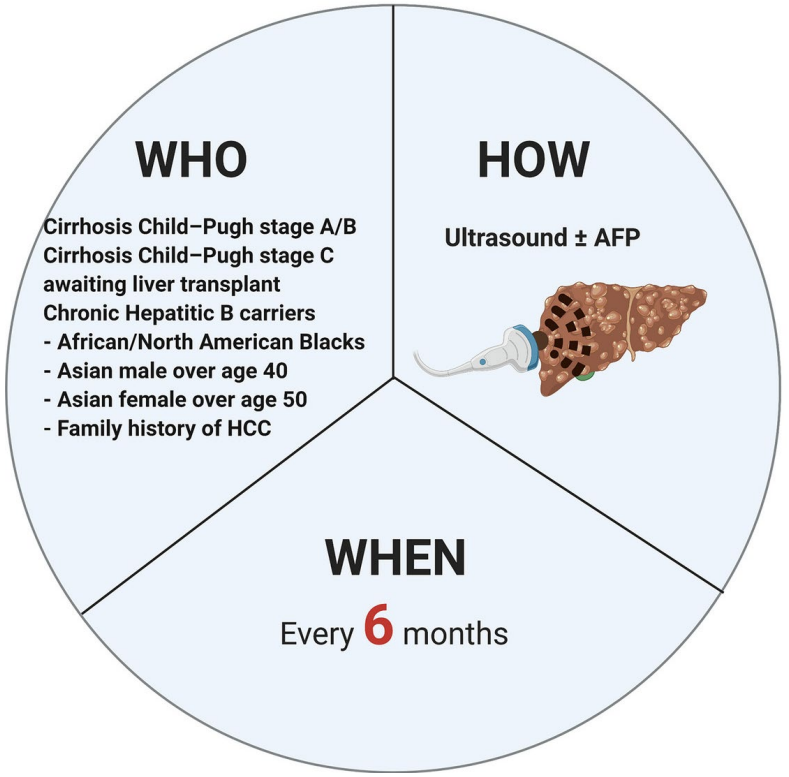
Europe
- Patients with cirrhosis
- Non-cirrhotic HBV patients at intermediate or high risk of HCC

USA
- Adult patients with cirrhosis

Asia Pacific
- Patients with cirrhosis due to HBV/HCV

China

Men ≥40 yo & women ≥50 yo with any of the following:
- HBV/HCV infection
- Alcoholism
- Diabetes and family history of HCC



Ultrasound scan every 6 months +/- serum AFP

1. Heimbach JK et al. AASLD Guidelines for the Treatment of Hepatocellular Carcinoma. Hepatology 2018;67:358-380; 2. Galle, PR et al. EASL Clinical Practice Guidelines: Management of hepatocellular carcinoma. J. Hepatol. 2018; https://doi.org/10.1016/j.jhep.2018.03.019; 3. Omata M, et al. Asian Pacific Association for the study of the liver consensus recommendations on hepatocellul;ar carcinoma. Hepatol. Int. 2010; 4: 439-474.; 4. Kudo, M et al.Evidence-based Clinical Practice Guidelines for Hepatocellular Carcinoma: The Japan Society of Hepatology 2013 update (3rdJSH-HCC Guidelines). Hepatology Research 2015; 45:123–127; 5. General Office of National Health Commission. Standard for diagnosis and treatment of primary liver cancer (2022 edition) [J]. J Clin Hepatol, 2022, 38(2): 288-303. 6. Cancer Expert Working Group on Cancer Prevention and Screening, Centre for Health Protection. https://www.chp.gov.hk/files/pdf/liver_cancer_professional_hp.pdf accessed 27 Sep 2021

Limitations of existing means of HCC surveillance

US +/- AFP in HCC

Sensitivity (pooled result from 18 studies, n=8526)

	Ultrasound alone	Ultrasound + AFP
Any stage	78% (95% CI 91% – 99%)	97% (95% CI 91% – 99%)
Early stage (within Milan criteria)	**45%** (95% CI 30% – 62%)	**63%** (95% CI 48% – 75%)

Specificity (pooled result from 6 studies, (n=4782)

	Ultrasound alone	Ultrasound + AFP
Any stage	92% (95% CI 85% – 96%)	84% (95% CI 77% – 89%)
Early stage (within Milan criteria)	90% (95% CI 86% – 93%)	83% (95% CI 79% – 86%)

Ultrasound

- suboptimal quality of exam in the presence of hepatic steatosis or advanced fibrosis
- technical difficulty for obese patients
- poor performance for small (<2cm) lesions
- long waiting time in the public health care system
- inter-observer variability

Serum AFP

False-positive :

- *Cirrhosis*
- *Active hepatitis*
- *Other types of tumours*

False-negative:

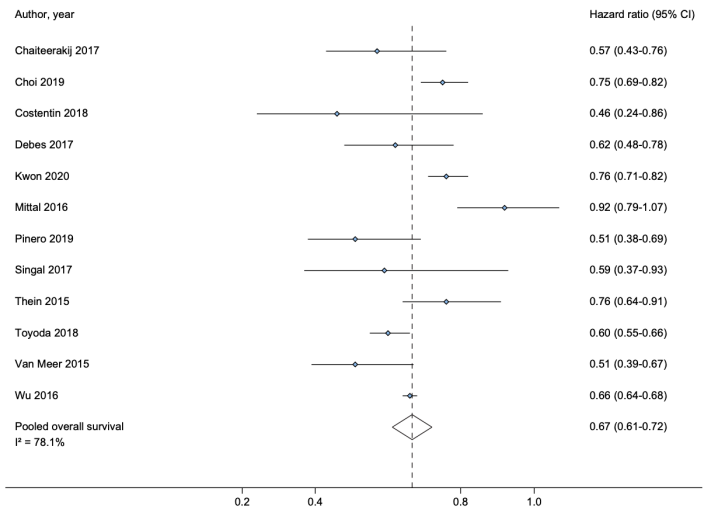
- *Non-AFP secretors*
- *Smaller tumours (<2cm)*

Cannot be used as standalone tool for HCC surveillance

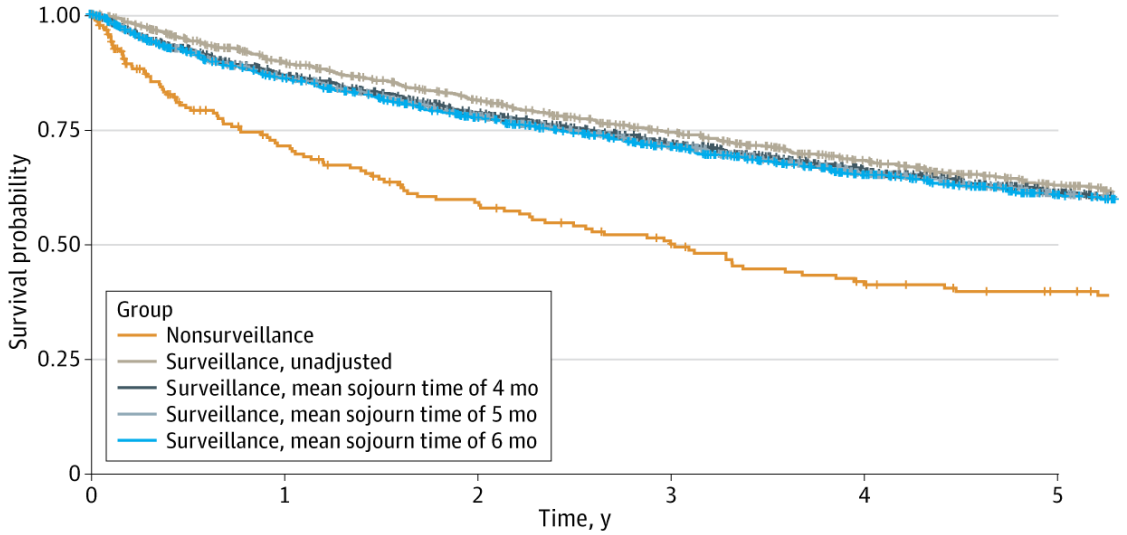
Simmons O, et al. Aliment Pharmacol Ther. 2017;45:169-177.doi:10.1111/apt.13841; EASL J Hepatol. 2018;69(1):182-236; Sherman M. Hepat Oncol. 2014;1(2):161–163. doi:10.2217/hep.13.22
Tzartzeva K, et al. Gastroenterology. 2018

HCC surveillance is associated with improved overall survival …but surveillance is heavily under-utilized

33%



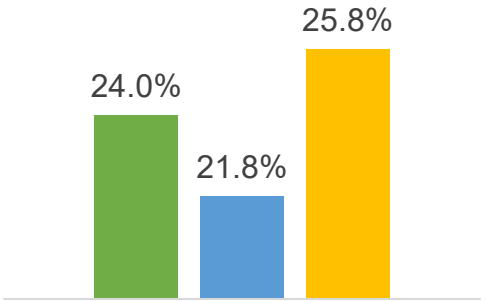
Singal AG, et al. J Hepatology 2022

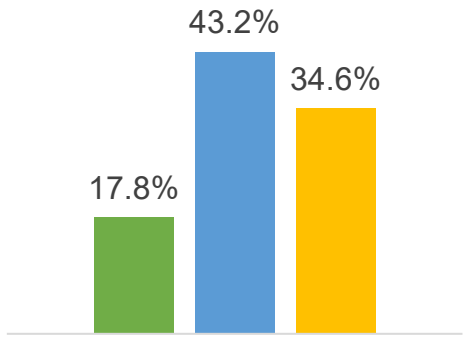


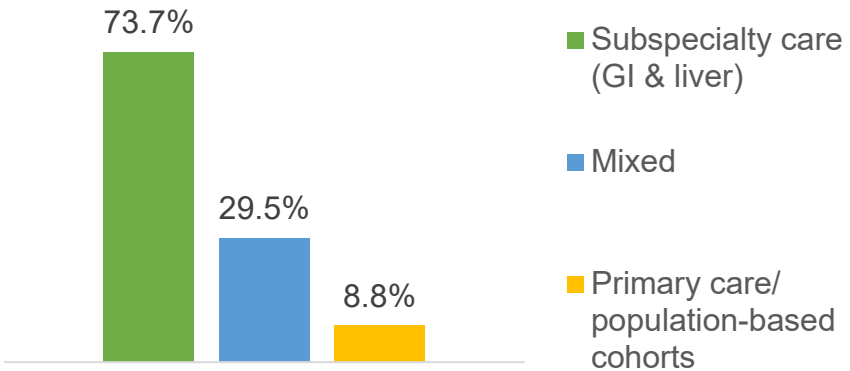
Lim, et al. JAMA Network Open 2025

Surveillance utilization

Meta-analysis: 29 studies (n=118,799 patients)

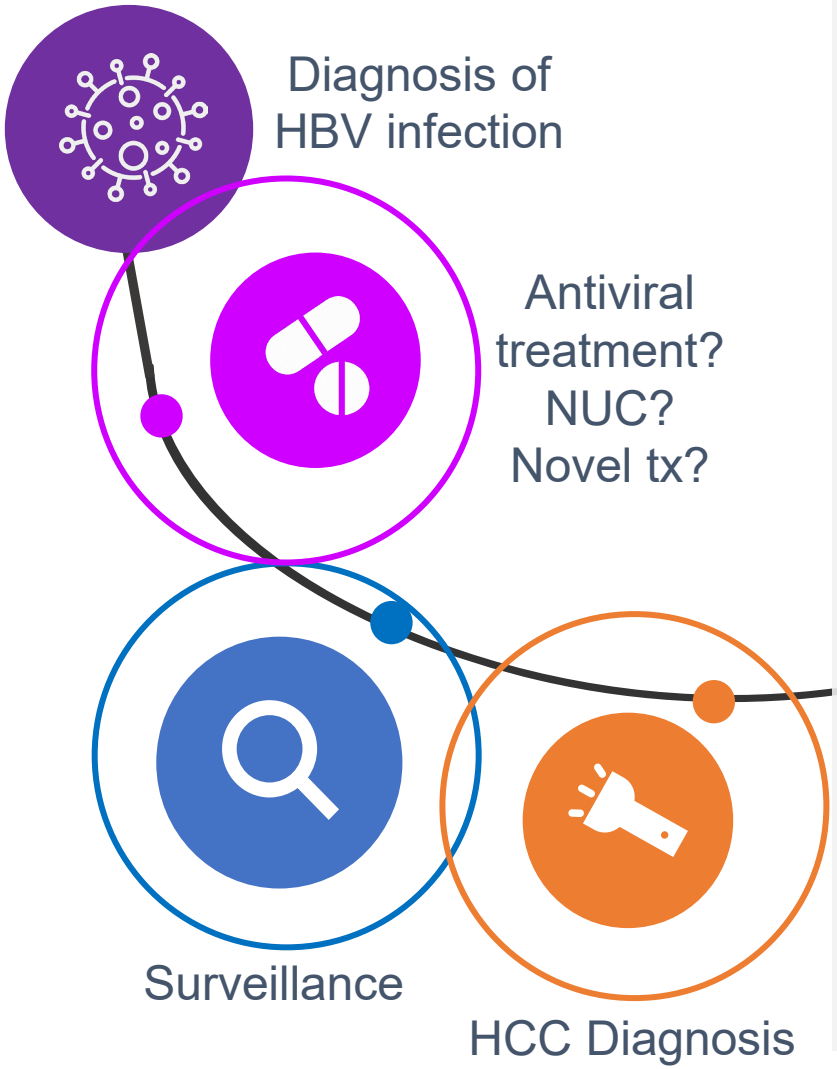


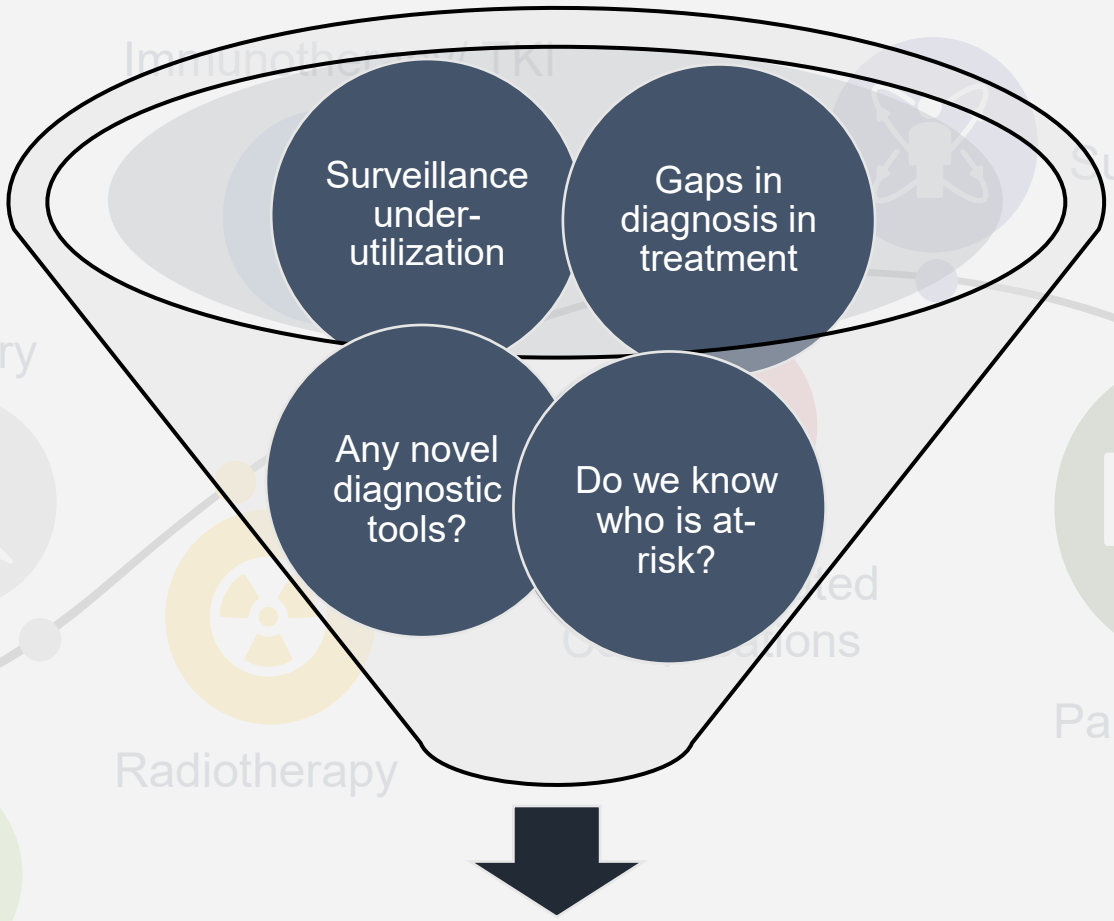




Wolf E, et al. Hepatology 2020

A typical patient journey for HBV-related HCC





Lower HCC risk, earlier diagnosis