Supplementary Table 1. Detailed Costs, Proportions of HCC Treatments, Transition Probabilities, and Recurrence Rates after HCC Treatments

Parameter	Thailand	USA	Reference
Monitoring and maintenance costs			
Laboratory investigations (per visit)	20		KCMH
Surveillance esophagogastroduodenoscopy	120		KCMH
Extra post-procedure surveillance MRI screening (per yr)	465		
Admission due to complications of cirrhosis (per admission)	519		Ref [1]
Post-transplantation	3,025	49,906	Ref [2,3]
Annual direct non-medical costs, $			
Compensated cirrhosis	127		Ref [4]
Decompensated cirrhosis	176		Ref [4]
Hospital visit, outpatient service (per visit)	20		Ref [4]
Proportion of initial treatments			
Transplantation in early HCC	0.13	0.14	KCMH, Ref [5-8]
Resection in early HCC	0.38	0.24	KCMH, Ref [5-8]
RFA in early HCC	0.23	0.20	KCMH, Ref [5-8]
TACE in early HCC	0.22	0.33	KCMH, Ref [5-8]
Best supportive care in early HCC	0.04	0.09	KCMH, Ref [5-8]
Resection in advanced HCC	0.24	0.09	KCMH, Ref [5-9]
RFA in advanced HCC	0.03	0.08	KCMH, Ref [5-9]
TACE in advanced HCC	0.50	0.45	KCMH, Ref [5-9]
Sorafenib in advanced HCC	0.04	0.01	KCMH, Ref [5-9]
Atezolizumab/bevacizumab in advanced HCC	0.01	0.13	KCMH, Ref [5-9]
Best supportive care in advanced HCC	0.18	0.24	KCMH, Ref [5-9]
Proportion of alternative treatment options for sensitivity analysis			
Transplantation in early HCC	0.12	0.11	KCMH, Ref [5,6,8]
Resection in early HCC	0.34	0.21	KCMH, Ref [5,6,8]
RFA in early HCC	0.21	0.21	KCMH, Ref [5,6,8]
TACE in early HCC	0.20	0.30	KCMH, Ref [5,6,8]
Radioembolization in early HCC	-	0.06	KCMH, Ref [5,6,8]
External radiation in early HCC	0.01	0.02	KCMH, Ref [5,6,8]
Best supportive care in early HCC	0.03	0.09	KCMH, Ref [5,6,8]
Resection in advanced HCC	0.28	0.09	KCMH, Ref [5,6,8-10]
RFA in advanced HCC	0.04	0.10	KCMH, Ref [5,6,8-10]
TACE in advanced HCC	0.43	0.36	KCMH, Ref [5,6,8-10]
Radioembolization in advanced HCC	0.09	0.12	KCMH, Ref [5,6,8-10]
External radiation in advanced HCC	0.05	0.03	KCMH, Ref [5,6,8-10]
Sorafenib in advanced HCC	0.03	0.01	KCMH, Ref [5,6,8-10]
Lenvatinib in advanced HCC	0.01	0.01	KCMH, Ref [5,6,8-10]
Atezolizumab/bevacizumab in advanced HCC	0.01	0.11	KCMH, Ref [5,6,8-10]
Best supportive care in advanced HCC	0.14	0.18	KCMH, Ref [5,6,8-11]
Annual progression			
HCC in early cirrhosis	0.03		Ref [12,13]
HCC in late cirrhosis	0.09		Ref [12,13]
Progression to the next ALBI stage	0.06		Ref [14]
Annual mortality			
Age-related mortality rate	WHO Mortality Database		Ref [15]
Early cirrhosis	0.013		Ref [16]
Late cirrhosis	0.075		Ref [16]
Early HCC	0.05		Ref [17]
Advanced HCC	0.96		Ref [17]
Post-transplantation in early cirrhosis	0.016		Ref [18]
Post-transplantation in late cirrhosis	0.084		Ref [18]
Post-resection in early cirrhosis	0.022		Ref [19]
Post-resection in late cirrhosis	0.036		Ref [19]
Post-RFA in early cirrhosis	0.01		Ref [20]
Post-RFA in late cirrhosis	0.08		Ref [20]
Post-TACE in early cirrhosis	0.22		Ref [21]
Post-TACE in late cirrhosis	0.40		Ref [21]
Post-radioembolization in early cirrhosis	0.12		Ref [22]

Supplementary Table 1. Continued

Parameter	Thailand	USA	Reference
Post-radioembolization in late cirrhosis		0.35	Ref [22]
Post-external radiation in early cirrhosis		0.10	Ref [23]
Post-external radiation in late cirrhosis		0.39	Ref [23]
Post-sorafenib in early cirrhosis		0.42	Ref [24]
Post-sorafenib in late cirrhosis		0.71	Ref [24]
Post-lenvatinib treatment		0.36	Ref [25]
Post-atezolizumab/bevacizumab treatment		0.27	Ref [26,27]
Recurrence rates after HCC treatments			
Recurrence after transplantation in early cirrhosis		0.02	Ref [18]
Recurrence after transplantation in late cirrhosis		0.082	Ref [18]
Recurrence after resection in early cirrhosis		0.08	Ref [19]
Recurrence after resection in late cirrhosis		0.09	Ref [19]
Recurrence after RFA in early cirrhosis		0.22	Ref [28]
Recurrence after RFA in late cirrhosis		0.26	Ref [28]
Recurrence after TACE in early cirrhosis		0.38	Ref [29]
Recurrence after TACE in late cirrhosis		0.38	Ref [29]
Recurrence after radioembolization treatment		0.30	Ref [30]
Recurrence after external radiation treatment		0.29	Ref [31]
Proportion of treatment after recurrence			
Resection		0.16	Ref [32]
RFA		0.30	Ref [32]
TACE		0.26	Ref [32]
Palliative		0.28	Ref [32]

HCC, hepatocellular carcinoma; KCMH, King Chulalongkorn Memorial Hospital; MRI, magnetic resonance imaging; RFA, radiofrequency ablation; TACE, transarterial chemoembolization; ALBI, albumin-bilirubin score; WHO, World Health Organization.

Supplementary Table 2. Included Studies in the Systematic Review and Meta-Analysis of the Performance of Ultrasonography with AFP in the Diagnosis of Early and Overall HCC

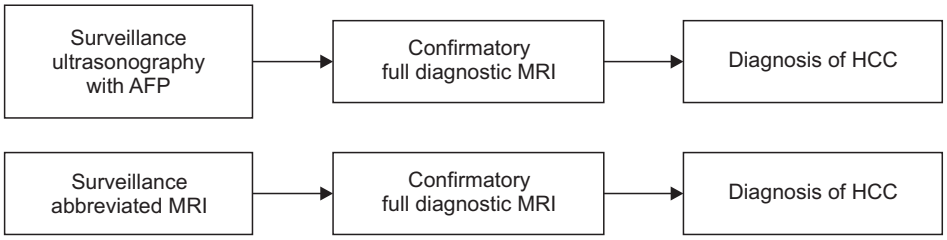
Study	Year	Country	Study type	Population, n	Sensitivity (95% CI)	Specificity (95% CI)	Reference standard
Mok *et al.*[33]	2005	Hong Kong	Prospective	940	Overall: 0.72 (0.53–0.86)	Overall: 0.92 (0.90–0.94)	Pathology, CT
Singal *et al.*[34]	2012	USA	Prospective	442	Early: 0.63 (0.44–0.80) Overall: 0.90 (0.77–0.97)	Early: 0.83 (0.79–0.87) Overall: 0.83 (0.79–0.87)	Pathology, imaging
Van Thiel *et al.*[35]	2004	USA	Retrospective	100	Overall: 0.70 (0.46–0.88)	Overall: 0.94 (0.86–0.98)	Pathology
Trinchet *et al.*[36]	2011	France	Prospective	638	Early: 0.75 (0.65–0.83)	Early: 0.83 (0.81–0.85)	Pathology, CT, MRI, arteriography
Chang *et al.*[37]	2015	Taiwan	Retrospective	1,597	Overall: 0.99	Overall: 0.60	Pathology, CT, MRI
Kim *et al.*[38]	2016	Korea	Prospective	407	Early: 0.33 (0.20–0.50) Overall: 0.40 (0.25–0.56)	Early: 0.88 (0.84–0.91) Overall: 0.90 (0.87–0.93)	Pathology, CT
Atiq *et al.*[39]	2017	USA	Retrospective	680	Early: 0.78 Overall: 0.62	Overall: 0.69	ICD-9 with adjudication according to AASLD guidelines

The inclusion criteria were: (1) conducted exclusively on cirrhotic patients; (2) provided data on imaging performance; (3) enough data to generate a 2 by 2 contingency table.
AFP, alpha-fetoprotein; HCC, hepatocellular carcinoma; CI, confidence interval; CT, computed tomography; MRI, magnetic resonance imaging; ICD-9, International Classification of Diseases, Ninth Revision; AASLD, American Association for the Study of Liver Diseases.

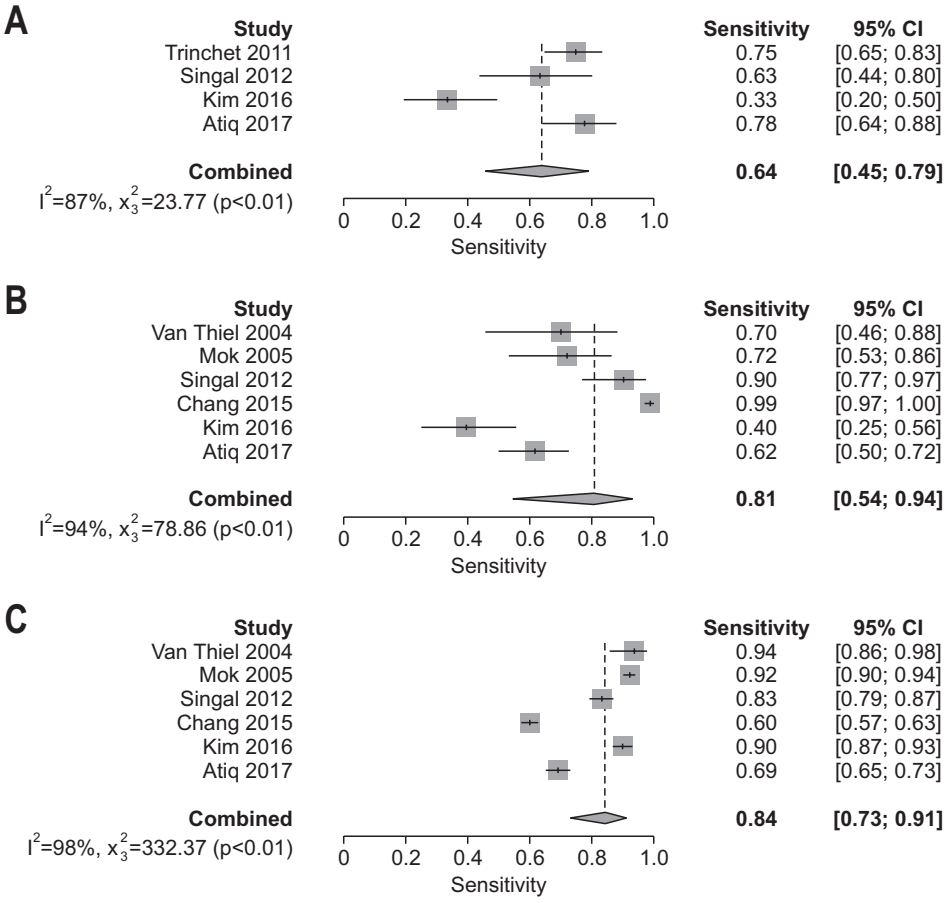
Supplementary Table 3. Included Studies in the Systematic Review and Meta-Analysis of the Performance of aMRI in the Diagnosis of Early and Overall HCC

Study	Year	Country	Study type	Population, n	Sensitivity (95% CI)	Specificity (95% CI)	Reference standard	aMRI protocols
Park *et al.*[40]	2020	Korea	Prospective	382	Early: 0.72 (0.56–0.85) Late: 1.00 (0.63–1.00) Overall: 0.77 (0.64–0.89)	Overall: 0.98 (0.97–0.99)	Pathology, CE-CT	T2-weighted, DWI
Park *et al.*[41]	2020	Korea	Retrospective	45	Early: 0.85 (0.75–0.93)	Early: 0.90 (0.82–0.96)	Pathology, full diagnostic MRI	T2-weighted, DWI, GRE
Vietti Violi *et al.*[42]	2020	USA	Retrospective	237	Overall: 0.62 (0.32–0.86)	Overall: 0.96 (0.92–0.98)	Pathology, full diagnostic MRI	T2-weighted, DWI
Chan *et al.*[43]	2019	Australia	Retrospective	188	Overall: 0.86 (0.75–0.94)	Overall: 0.86 (0.76–0.93)	Full diagnostic MRI	T1-weighted, T2-weighted, DWI
Besa *et al.*[44]	2017	USA	Retrospective	174	Overall: 0.82 (0.71–0.90)	Overall: 0.93 (0.86–0.97)	Pathology	DWI
Jalli *et al.*[45]	2015	Iran	Retrospective	96	Overall: 0.83 (0.65–0.94)	Overall: 1.00 (0.95–1.00)	Pathology, full diagnostic MRI	T1-weighted, T2-weighted, DWI
Park *et al.*[46]	2012	Korea	Retrospective	260	Early: 0.79 (0.72–0.85)	Early: 0.97	Pathology	T1-weighted, T2-weighted, DWI
Vandecaveye *et al.*[47]	2009	Belgium	Prospective	55	Early: 0.91 (0.76–0.98) Late: 1.00 Overall: 0.95 (0.87–0.99)	Overall: 0.83 (0.70–0.92)	Pathology, full diagnostic MRI	DWI

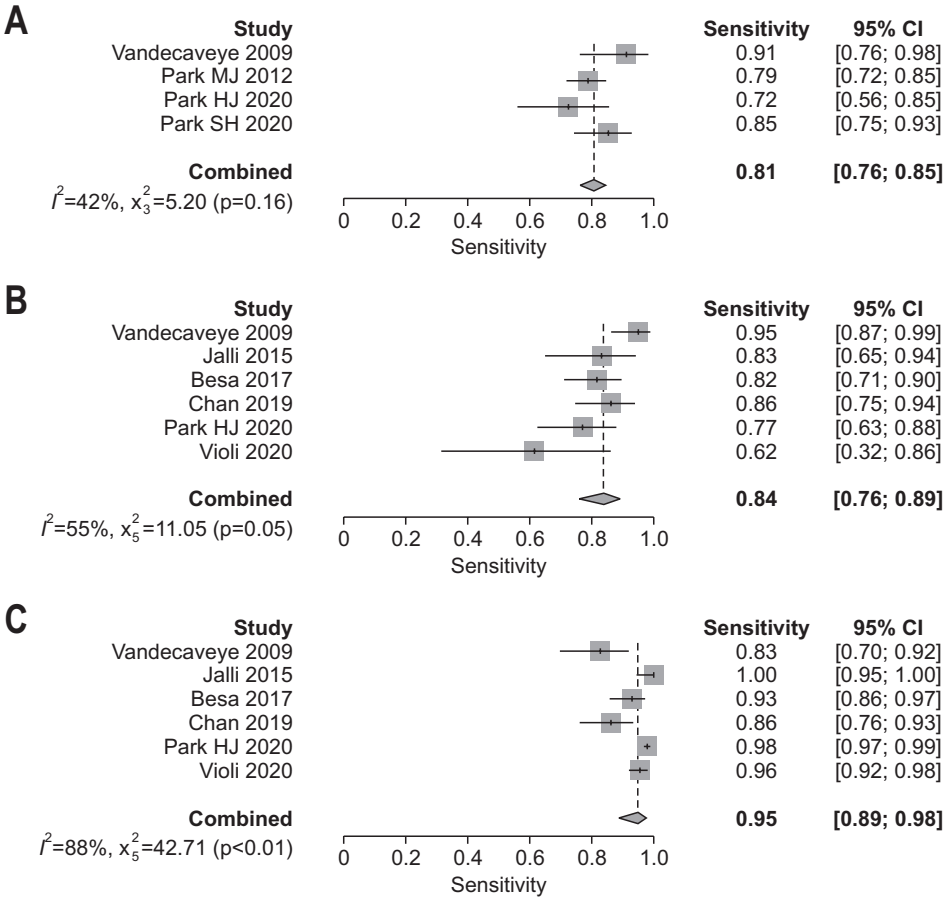
The inclusion criteria were: (1) conducted exclusively on cirrhotic patients; (2) provided data on imaging performance; (3) enough data to generate a 2 by 2 contingency table.
aMRI, abbreviated magnetic resonance imaging; HCC, hepatocellular carcinoma; CI, confidence interval; CE-CT, contrast-enhanced computed tomography; DWI, diffusion-weighted imaging; GRE, gradient echo sequences.



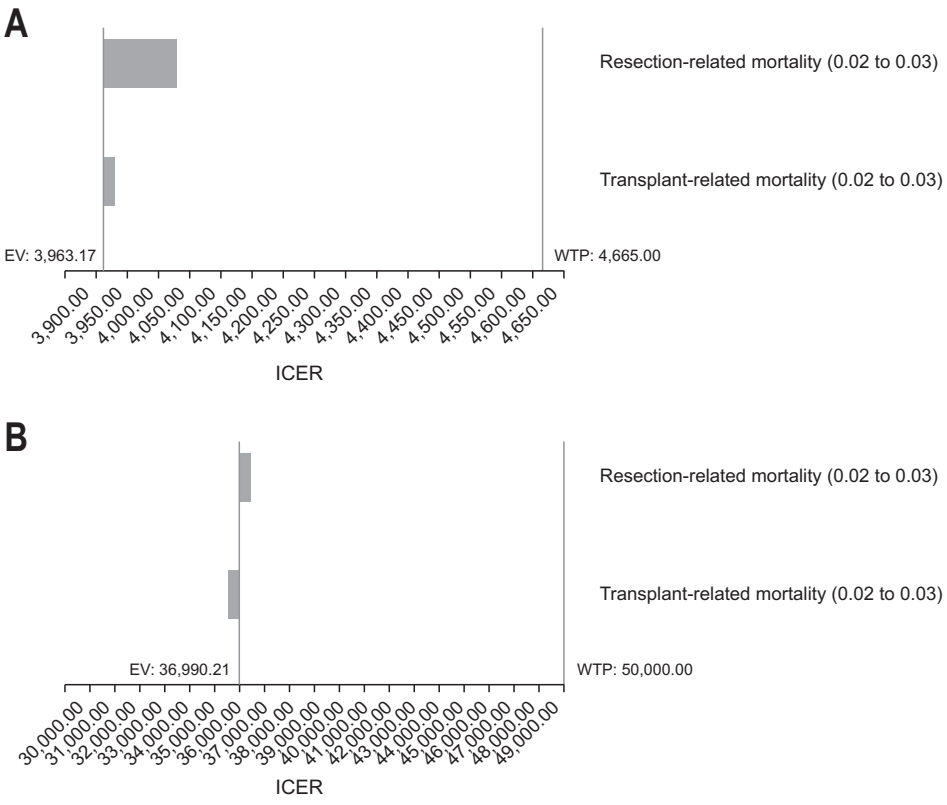
Supplementary Fig. 1. HCC surveillance protocols. AFP, alpha-fetoprotein; MRI, magnetic resonance imaging; HCC, hepatocellular carcinoma.



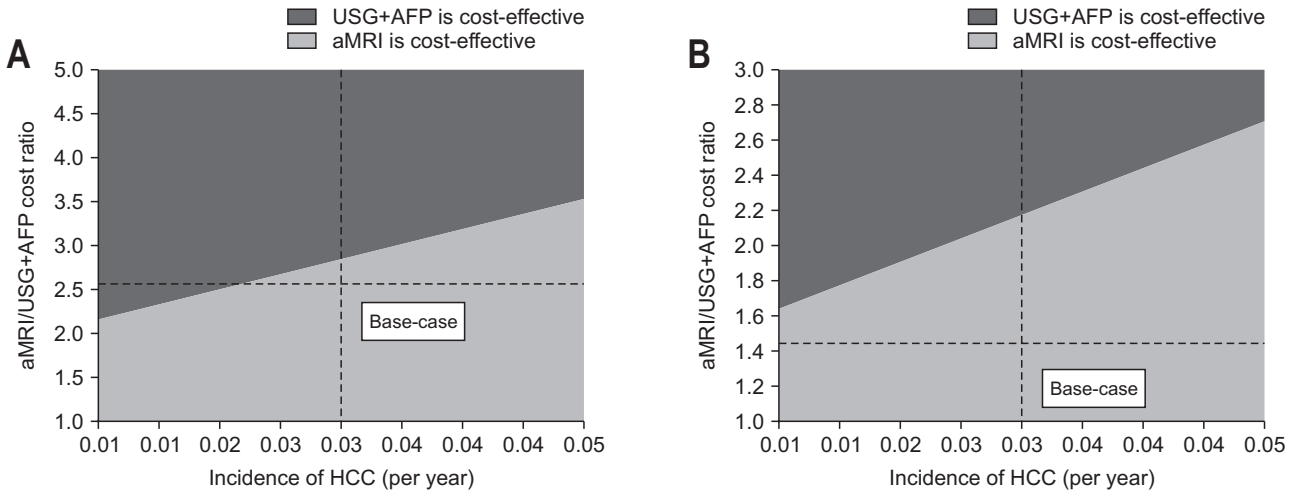
Supplementary Fig. 2. Sensitivity of ultrasonography with alpha-fetoprotein for early hepatocellular carcinoma diagnosis (A), overall hepatocellular carcinoma diagnosis (B), and overall specificity (C). CI, confidence interval.



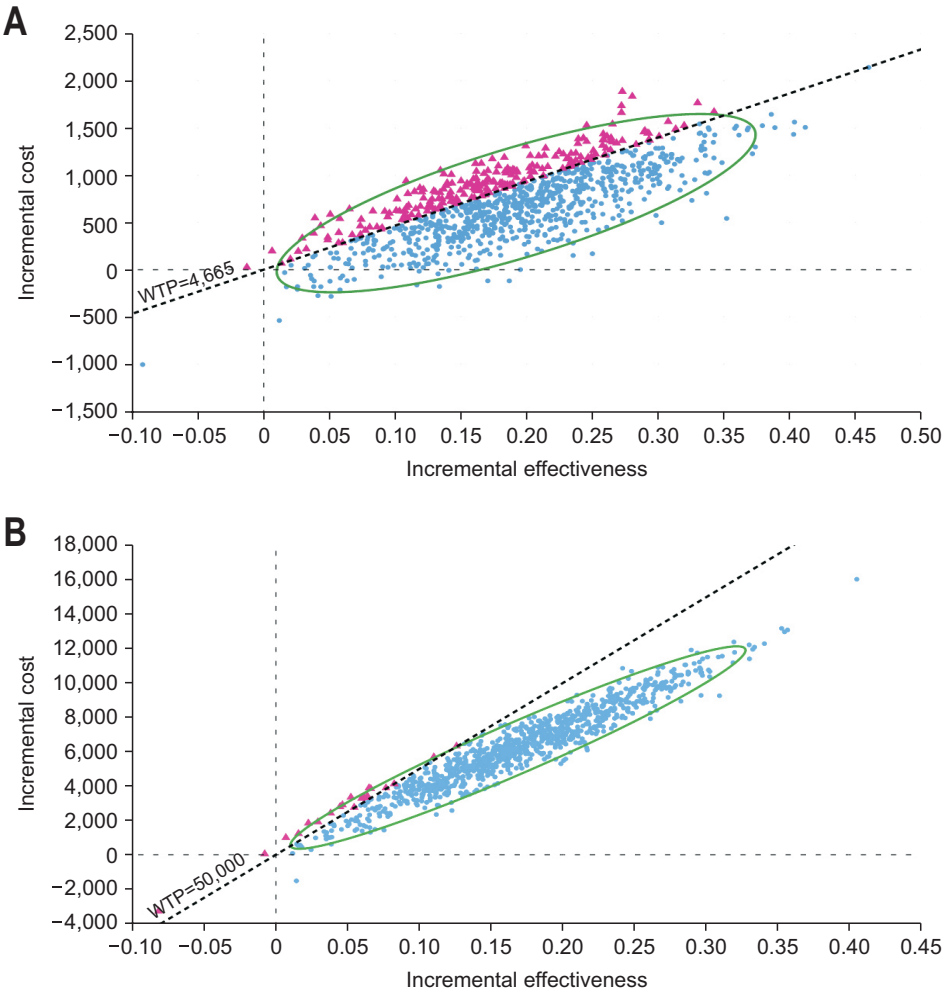
Supplementary Fig. 3. Sensitivity of abbreviated magnetic resonance imaging for early hepatocellular carcinoma diagnosis (A), overall hepatocellular carcinoma diagnosis (B), and overall specificity (C). CI, confidence interval.



Supplementary Fig. 4. Tornado diagram of the sensitivity analysis for treatment-related mortality rates (2% to 3% for resection and transplantation) in the Thailand setting (A) and U.S. setting (B). EV, expected value; ICER, incremental cost-effectiveness ratio; WTP, willingness-to-pay.



Supplementary Fig. 5. Two-way sensitivity analysis for HCC incidence and aMRI/USG with AFP cost ratio in Thailand setting (A) and the U.S. setting (B). The intersection between dash lines represents base-case results. HCC, hepatocellular carcinoma; aMRI, abbreviated magnetic resonance imaging; USG, ultrasonography; AFP, alpha-fetoprotein.



Supplementary Fig. 6. Scatter plot of probabilistic sensitivity analyses. Scatter plot of probabilistic sensitivity analyses of 1,000 repeated analyses comparing aMRI with combined USG and AFP in Thailand (A) and the United States (B). Blue circles represent iterations in which aMRI is the optimal strategy (superior or cost-effective) and magenta squares represent iterations in which USG with AFP is the optimal strategy. In Thailand, aMRI was the optimal strategy in 773 iterations (superior to USG with AFP in 26 iterations and cost-effective in 747 iterations). USG with AFP was the optimal strategy in 227 iterations (superior to aMRI in 1 iteration and cost-effective in 226 iterations). In the United States, aMRI was the optimal strategy in 979 iterations (superior to USG with AFP in 1 iteration and cost-effective in 978 iterations). USG with AFP was the optimal strategy in 21 iterations (superior to aMRI in 1 iteration and cost-effective in 20 iterations).
aMRI, abbreviated magnetic resonance imaging; USG, ultrasonography; AFP, alpha-fetoprotein; WTP, willingness-to-pay.

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