

Cost-Effectiveness of rhTNK-tPA Versus rt-PA for Acute Ischemic Stroke Patients Within 4.5H of Symptom Onset in China

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OBJECTIVES

To assess the cost-effectiveness of recombinant human TNK tissue-type plasminogen activator (rhTNK-tPA) compared to alteplase (rt-PA) for intravenous thrombolysis in acute ischemic stroke (AIS) patients within 4.5 hours of symptom onset, from the perspective of the healthcare system.

METHODS

A decision tree-Markov model was developed to estimate quality-adjusted life years (QALYs), direct medical costs, and incremental cost-effectiveness ratios (ICERs) for AIS patients receiving thrombolytic agent. The efficacy and safety data, drug costs, other direct medical expenses, and utility value data were sourced from TRACE Phase III clinical trial and literature databases. The model simulates a short term of one year and lifetime of 20 years results, with a cycle length of 3 months. One-way sensitivity analysis and probabilistic sensitivity analysis (PSA) with 10 000 simulations were used to test the robustness of the model.

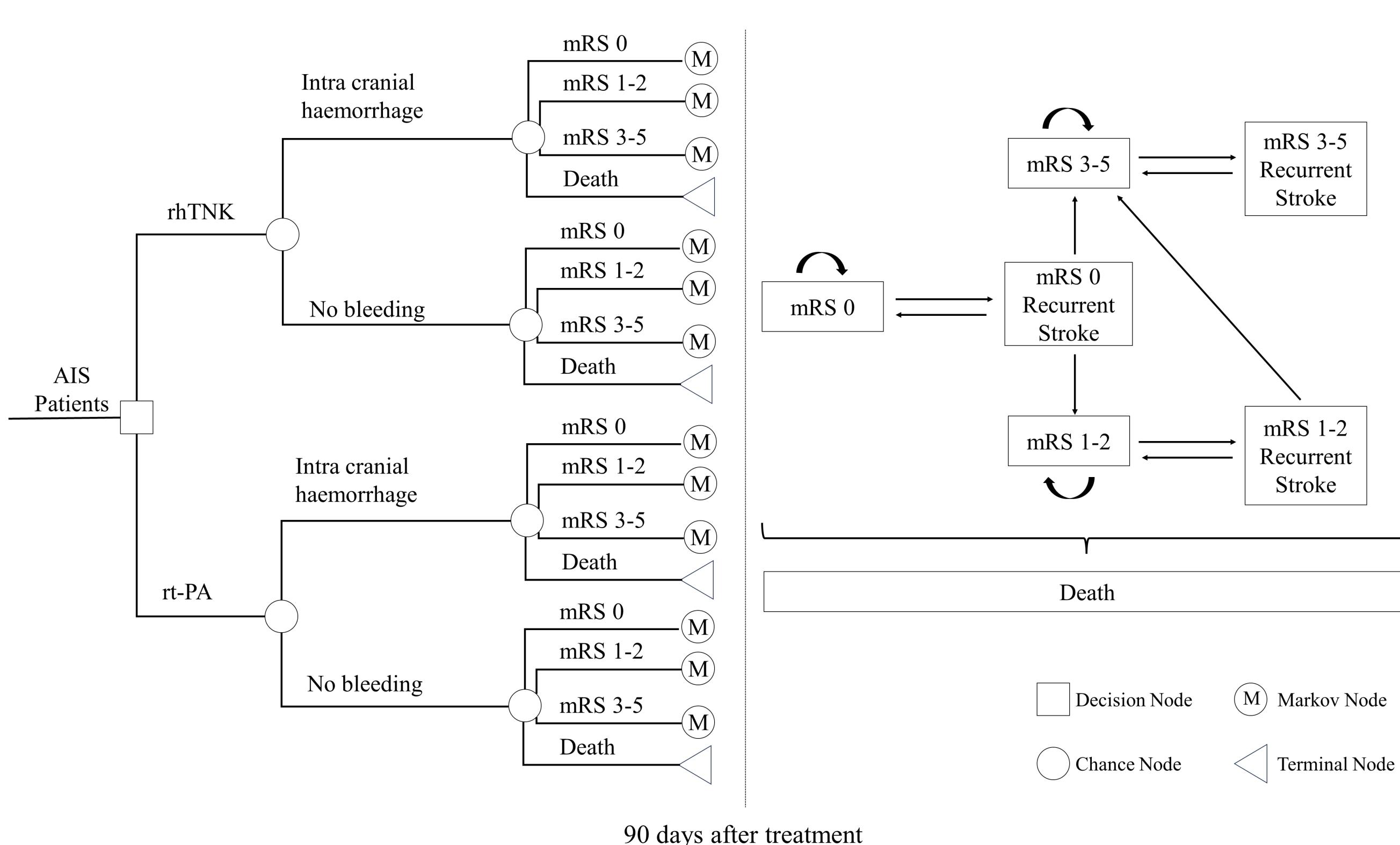


Figure 1 Structure of Decision Tree-Markov Model

RESULTS

Base-Case Analysis: The cost-effectiveness analysis demonstrated that the lifetime costs for patients in the rhTNK-tPA and rt-PA groups were CNY 136 076 and CNY 148 355, respectively, with corresponding QALYs of 6.01 and 5.95. The rhTNK-tPA group not only incurred lower treatment costs but also achieved higher QALYs, suggesting that rhTNK-tPA is a dominant therapeutic option compared to rt-PA.

Table 1 Short-Term (1 year) and Long-Term (20 years) Cost-Effectiveness Analysis Results

Time Horizon	Thrombolytic Drug	Total Cost	QALYs	ICER (CNY/QALY)
Short-term (1 year)	rhTNK-tPA	¥30 311	0.75	Dominant
	rt-PA	¥34 679	0.75	
Long-term (20 years)	rhTNK-tPA	¥136 076	6.01	Dominant
	rt-PA	¥148 355	5.95	

Sensitivity Analysis: One-way sensitivity analysis showed the model results were most sensitive to the utility values for the mRS 1-2 state (for both groups). The deterministic and probabilistic sensitivity analyses showed the base-case results to be robust.

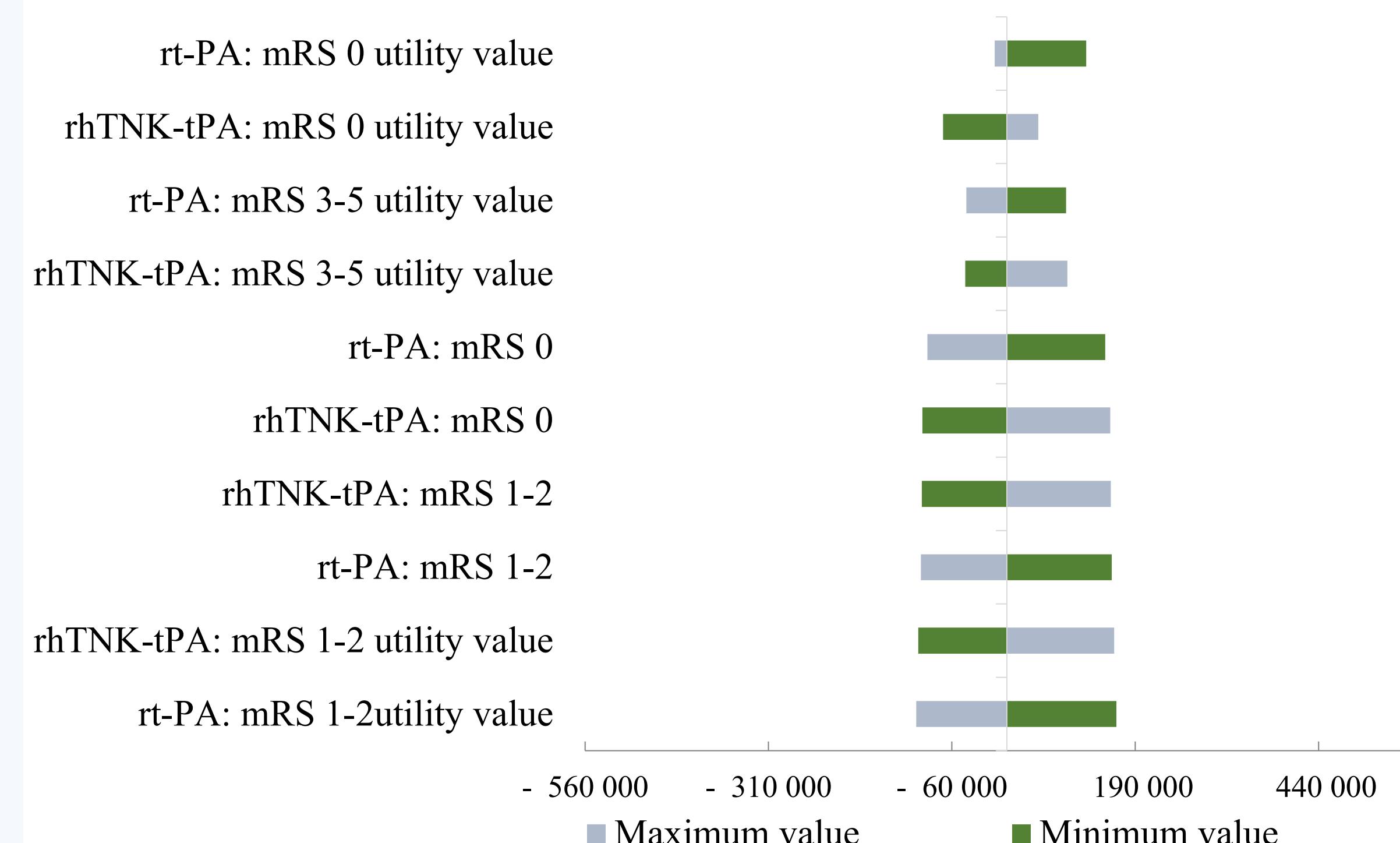


Figure 2 One-Way Sensitivity Analysis of Long-Term (20 years) Simulated Cost-Effectiveness

At the WTP threshold of 1 times the 2024 per capita GDP of China, rhTNK-tPA had an 84.34% probability of being cost-effective. The Cost-Effectiveness Acceptability Curve, generated from the PSA, demonstrated that rhTNK-tPA maintained a higher probability of being cost-effective than rt-PA across the entire range of WTP thresholds simulated.

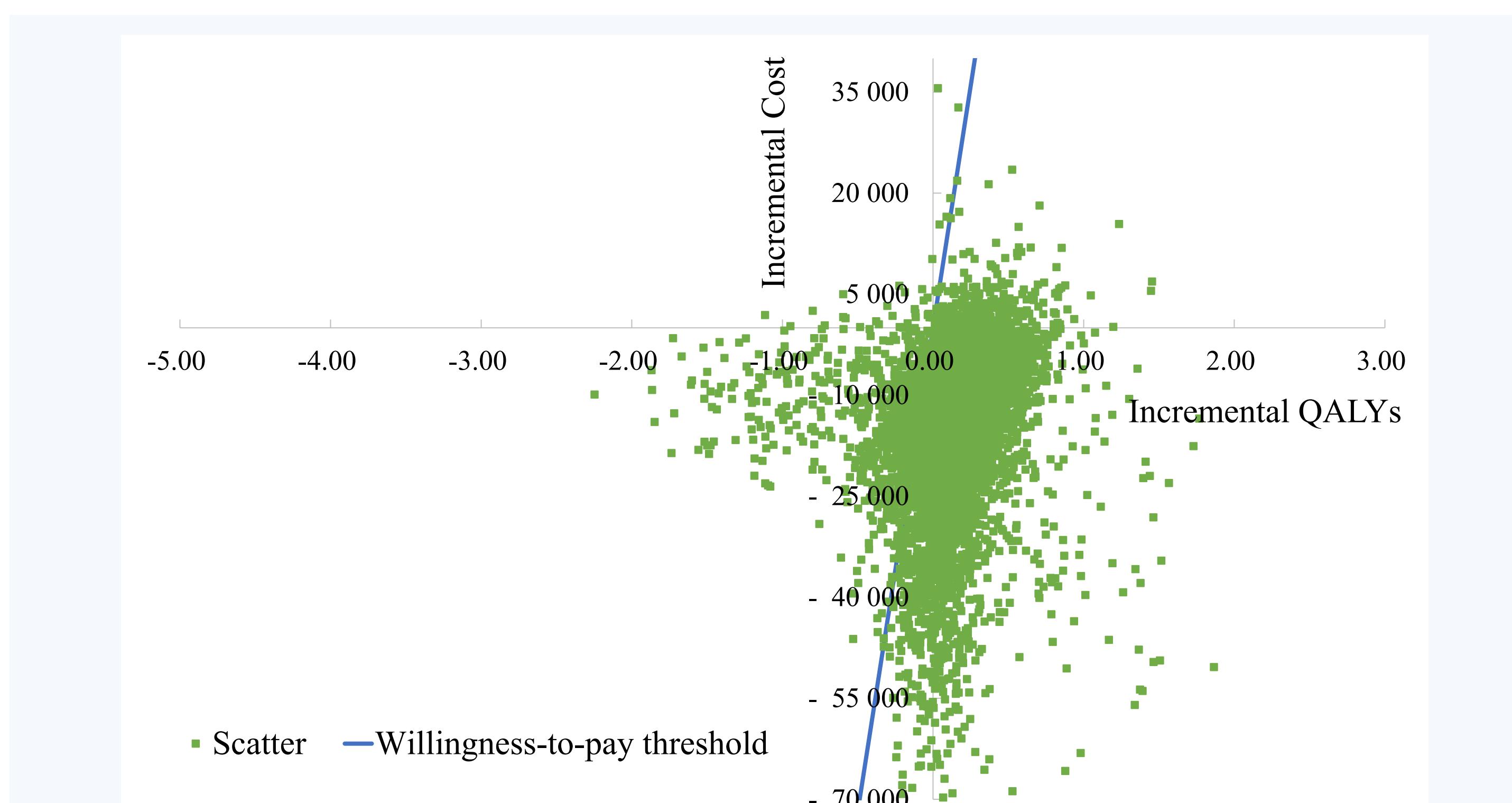


Figure 3 Probabilistic Sensitivity Analysis of Long-Term (20 years) Simulated Cost-Effectiveness: Scatter Plot of ICER
2024 per capita GDP of China: CNY 95 797

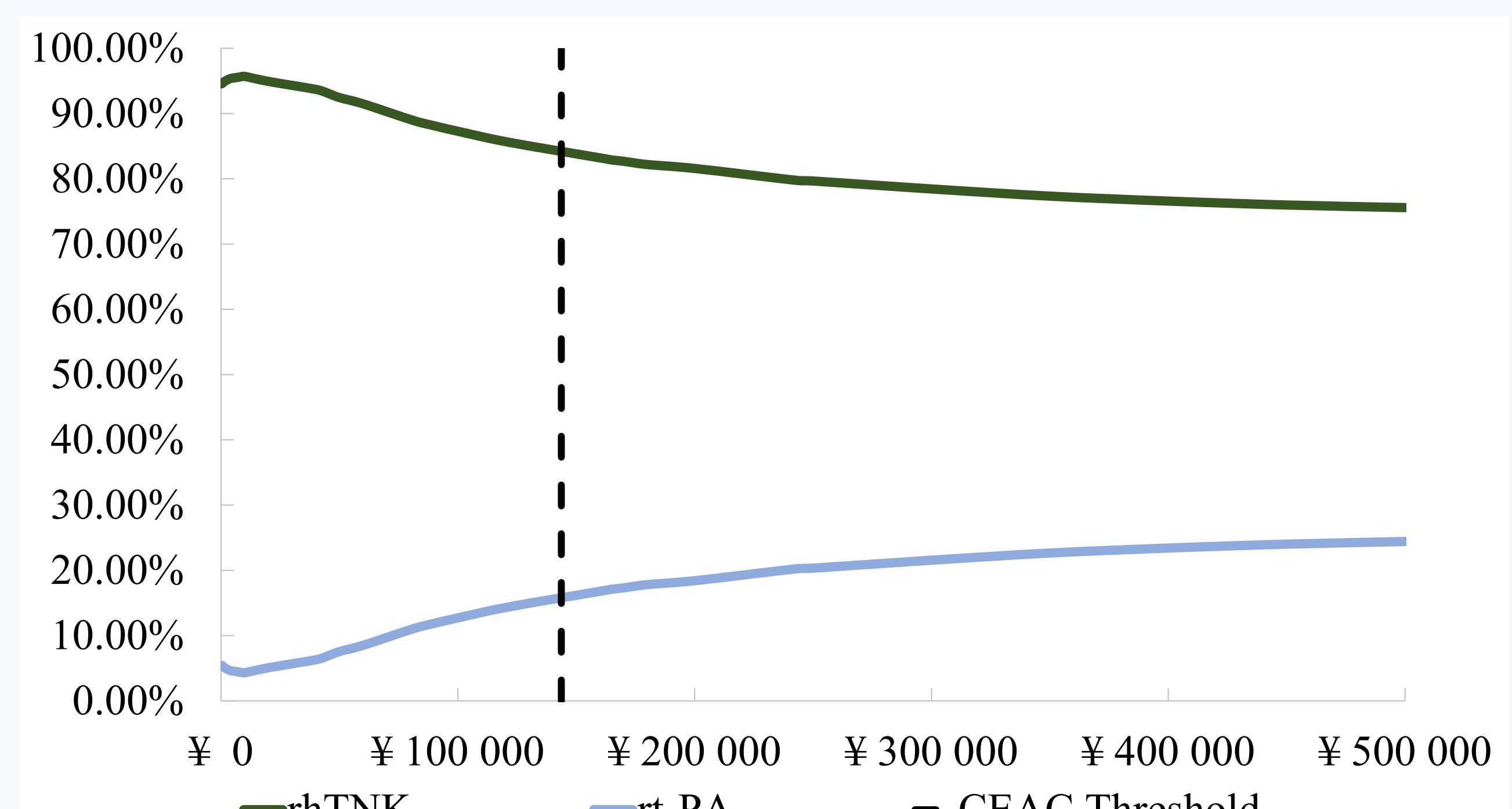


Figure 4 Long-Term (20 years) Cost-Effectiveness Acceptability Curve (CEAC)
CEAC Threshold: 2024 per capita GDP of China (CNY 95 797)

CONCLUSIONS

From the perspective of the Chinese healthcare system, rhTNK-tPA is a dominant, cost-saving strategy compared to rt-PA for AIS patients requiring intravenous thrombolysis within 4.5 hours of onset. It is projected to reduce lifetime medical costs while simultaneously improving patient quality of life.