

Pharmacoeconomic Evaluation of Danhong Injection for Ischemic Stroke Patients: Real-World Evidence from China



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INTRODUCTION

- Ischemic stroke patients face a substantial disease burden and require more cost-effective treatment. Danhong Injection is a commonly used traditional Chinese medicine injection in the clinical treatment of stroke.
- Previous economic evaluations of medications for ischemic stroke treatment are predominantly limited to chemical regimes, lacking real-world evidence on the cost-effectiveness of traditional Chinese medicine. The health outcomes and medical costs of the treatment plan combining basic treatment with Danhong Injection versus basic treatment alone for patients with ischemic stroke were explored, and a pharmacoeconomic evaluation was conducted.

METHODS

- We conducted a multicenter, prospective, observational study to investigate the effectiveness and economics of Danhong Injection in ischemic stroke patients from the perspective of the Chinese healthcare system.
- Eligible patients were categorized into two groups: the exposure group, receiving Danhong Injection plus basic treatment, and the non-exposure group, receiving basic treatment alone.
- We collected demographic information, National Institutes of Health Stroke Scale (NIHSS) scores, EQ-5D-5L scale scores, and medical expenses during a one-month follow-up.
- Propensity score matching (PSM) was employed to control for confounding factors. Incremental Cost-Utility Ratios (ICUR) were used to assess the cost-utility of the treatments.
- Subgroup analyses were conducted based on gender, age, baseline health status, and other criteria. Probability sensitivity analyses were performed considering patients' utility, probability values, and costs to validate the robustness of results.

CEA results

➤ Cost-effectiveness analysis of Danhong injection + basic treatment group vs basic treatment group alone

treatment program	C (Yuan)	E	ΔC (Yuan)	ΔE	ICER
Basic treatment group alone	12407	1.86	—	—	—
Danhong injection + basic treatment group	13434	1.16	1027	-	-1467

Note: C is total cost; E is NIHSS score; ICER = $\Delta C / \Delta E$.

CUA results

➤ Cost-utility analysis of Danhong injection + basic treatment group vs. basic treatment group alone

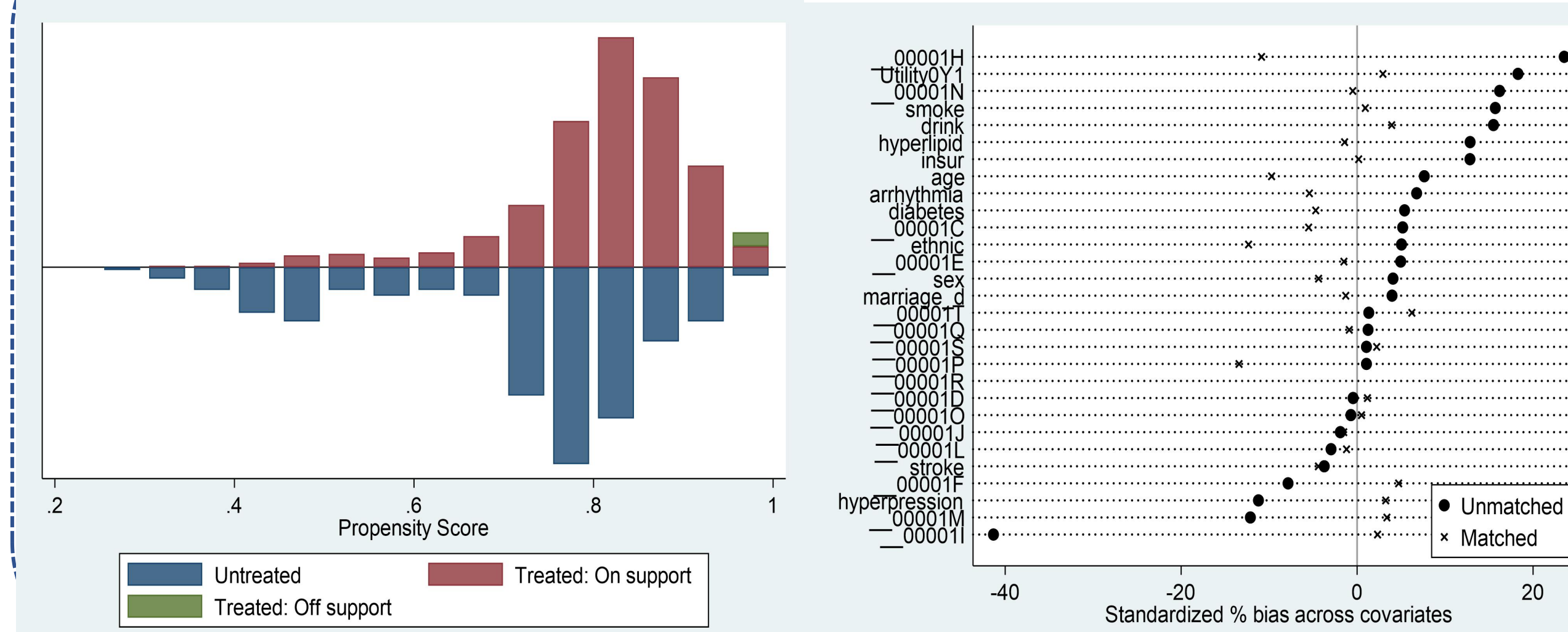
treatment program	C (Yuan)	QALYs	ΔC (Yuan)	ΔQALYs	ICUR
Basic treatment group alone	12407	0.058	—	—	—
Danhong injection + basic treatment group	13434	0.067	1027	0.0086	119419

Note: C is the total cost; ICUR = $\Delta C / \Delta$ QALYs.

RESULTS

PSM

➤ Results of PSM



➤ Results of statistical test after PSM

	basic treament		Danhong injection +basic treatment		
	Obs	mean	Obs	mean	Difference value
One month of NIHSS	289	1.862	1131	1.161	-0.701***
One month of QALY	289	0.058	1131	0.067	0.009***
Total medical expenses	289	12407.533	1131	13434.308	1026.775

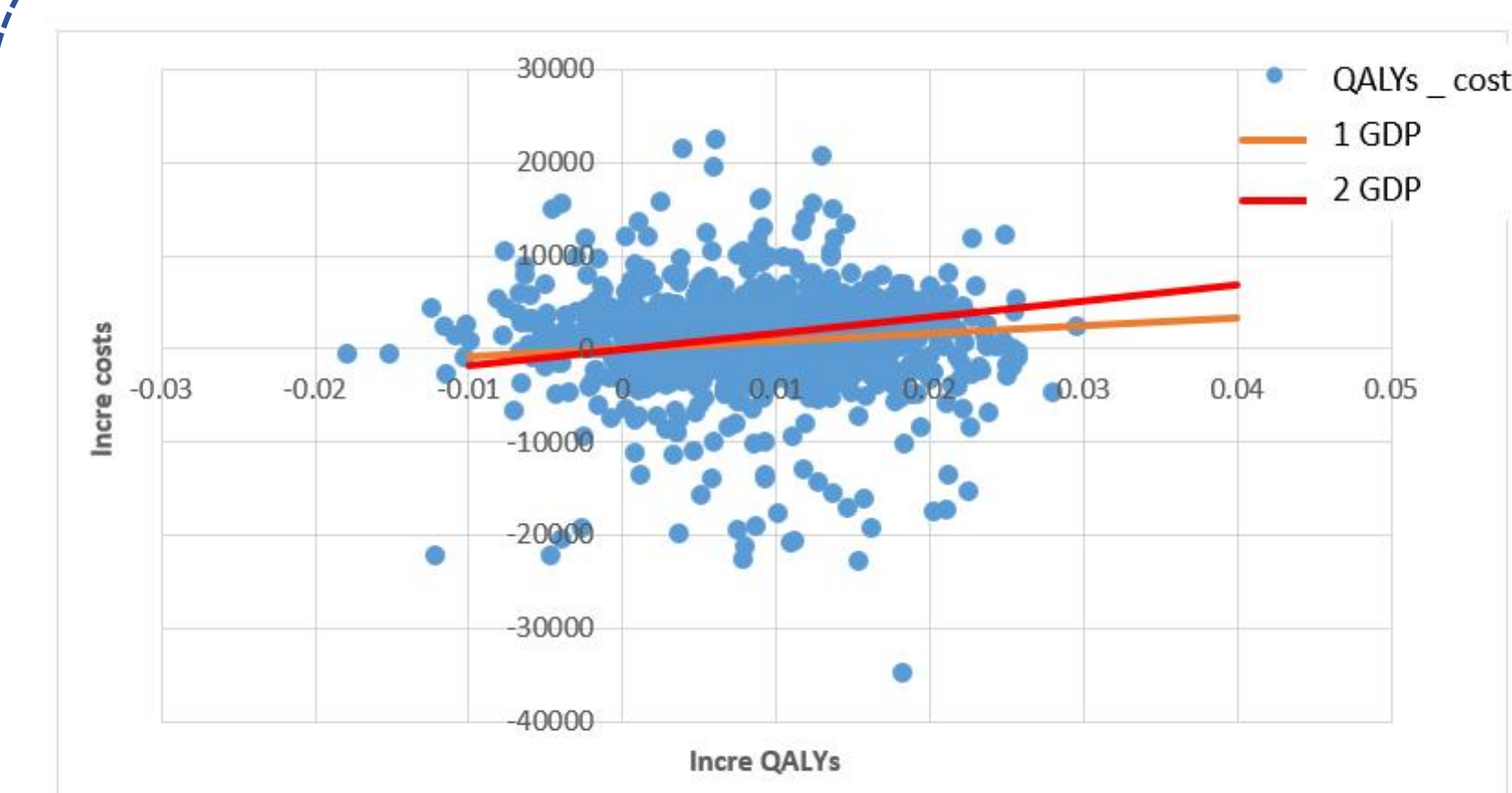
Note: *** indicates $p < 0.001$

Subgroup analysis

➤ Results of subgroup analysis

Classification	Grouping	Number of cases	QALY values in the first month	NIHSS scores in the first month	Total costs for one month	medical for one ICUR
Male	Non-exposure	175	0.059	1.891	13585.2	
	Exposure	665	0.069	1.026	13696.4	11118
	P		0.000	0.000	0.918	
Female	Non-exposure	114	0.058	1.816	10599.7	
	Exposure	466	0.065	1.354	13060.3	351515
	P		0.000	0.0912	0.012	
Age <65	Non-exposure	119	0.06	1.706	14056.6	
	Exposure	454	0.068	0.923	14763.4	88354
	P		0.000	0.000	0.635	
Age>65	Non-exposure	170	0.058	1.971	11253.2	
	Exposure	677	0.066	1.321	12543.0	161226
	P		0.000	0.002	0.083	
Non-smoking	Non-exposure	254	0.058	1.89	12583.9	
	Exposure	944	0.067	1.136	13299.8	79545
	P		0.000	0.000	0.399	
Smoking	Non-exposure	35	0.059	1.657	11127.4	
	Exposure	187	0.068	1.289	14113.1	331751
	P		0.005	0.334	0.032	
mRS score=0	Non-exposure	143	0.058	1.895	11504.7	
	Exposure	511	0.069	1.147	12333.5	75346
	P		0.000	0.000	0.420	
mRS score=1	Non-exposure	145	0.059	1.834	13241.7	
	Exposure	620	0.066	1.173	14341.6	157129
	P		0.000	0.000	0.313	

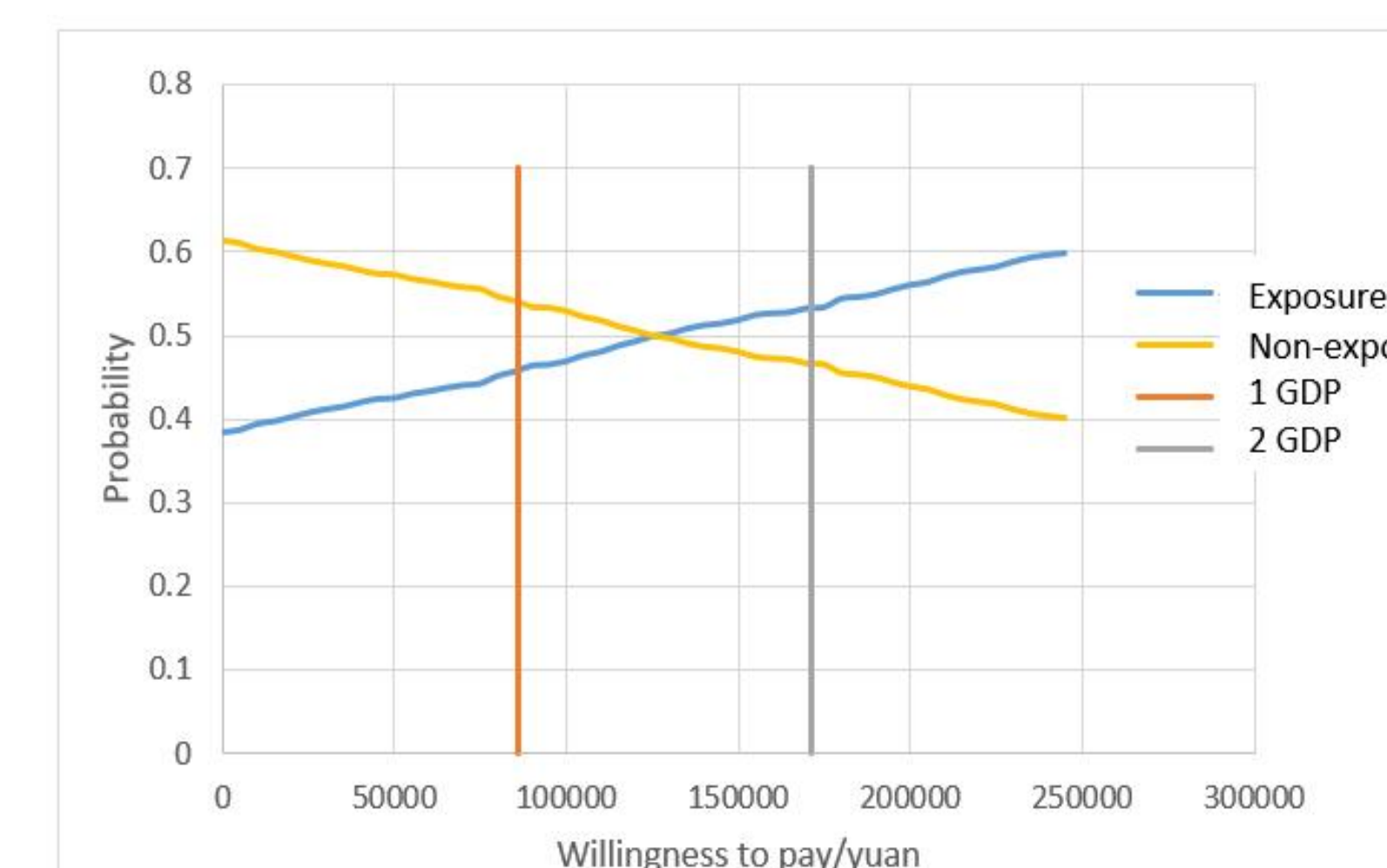
Sensitivity analysis



➤ Results of sensitivity analysis

➤ When the WTP threshold is taken to be one times 2022 GDP per capita (85,698 yuan) in China, less than half of the scatters in the cost-effectiveness plane lie below the WTP threshold line, and the cost-effectiveness acceptability curve shows that there is a less than 50% probability that the exposed group is economical.

➤ When the WTP threshold is taken as 2 times 2022 GDP per capita (171,396 yuan) in China, the cost-effects acceptable curve shows that the exposed group has more than 50% probability of being economical.



CONCLUSION

At a threshold of twice the per capita GDP (85,698 yuan) in China, the Danhong injection plus basic treatment group demonstrates cost-effectiveness compared to the basic treatment group, making it a recommendable option for patients with ischemic stroke.