

Cost-effectiveness Analysis of Sodium Zirconium Cyclosilicate for Treating Hyperkalemia among Chinese Patients

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Objectives

Hyperkalemia most commonly develops in patients with heart failure (HF) and/or chronic kidney disease (CKD).^{1,2}

Sodium zirconium cyclosilicate (SZC) is a new selective potassium (K⁺) binder for the treatment of hyperkalemia.³

The aim of this study was to evaluate the cost-effectiveness of SZC versus usual care (consisting of calcium polystyrene sulfonate (CPS), lifestyle interventions, RAASi modifications, etc.) for the treatment of hyperkalemia among HF and CKD patients in China.

Methods

Individual patient microsimulation models were constructed to simulate a HF cohort across the lifetime horizon and a CKD cohort until the initiation of renal replacement therapy (RRT).⁴ K⁺ levels were based on two phase 3 clinical trials.⁵⁻⁷

Health state utility and event incidence rates were retrieved from literature.⁸⁻¹⁴ Drug costs and healthcare utilization costs were obtained from negotiated price, literature, and expert interviews.¹⁵⁻¹⁸

Costs and quality-adjusted life-years (QALYs) were both discounted at 5%. The main outcomes were overall costs, QALYs, and incremental cost-effectiveness ratio (ICER).

The willingness to pay (WTP) threshold in China is CNY 80,976-242,928/QALY, which is one to three times the gross domestic product per capita. Sensitivity analyses were performed to characterize model's uncertainty.

Results

The base case results revealed that SZC was associated with 2.86 QALYs and CNY 92,671.58; usual care was associated with 1.81 QALYs and CNY 54,101.26 in the HF cohort. In CKD cohort, SZC was associated with 3.23 QALYs and CNY 121,416.82; usual care was associated with 2.91 QALYs and CNY 111,464.57. SZC resulted in an ICER of CNY 36,735.87/QALY for the HF cohort and CNY 31,181.55/QALY for the CKD cohort, respectively. (Table 1)

The one-way sensitivity analyses (Figure 1 & and Figure 2) probability sensitivity analyses (Figure 3 & and Figure 4) found the results were robust.

Table 1. Base case results

	Cost	△Cost	QALY	△QALY	ICER
HF cohort					
Usual care	54,101.26		1.81		
SZC	92,671.58	38,570.31	2.86	1.05	36,735.87
CKD cohort					
Usual care	111,464.57		2.91		
SZC	121,416.82	9,952.25	3.23	0.32	31,181.55

Conclusion

At negotiated price SZC is a cost-effective treatment for hyperkalemia compared to usual care in HF and CKD patients. SZC is an important new option for the management of hyperkalemia in China.

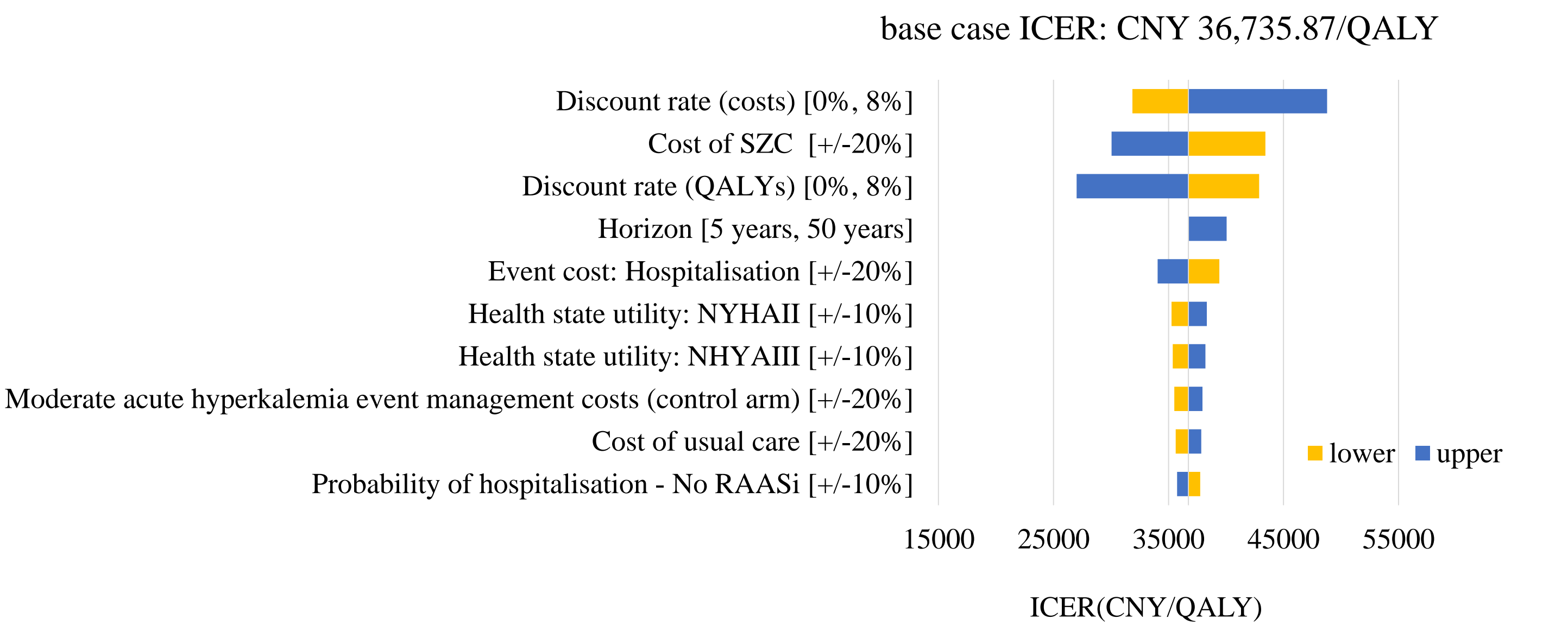


Figure 1. Tornado diagram: HF cohort

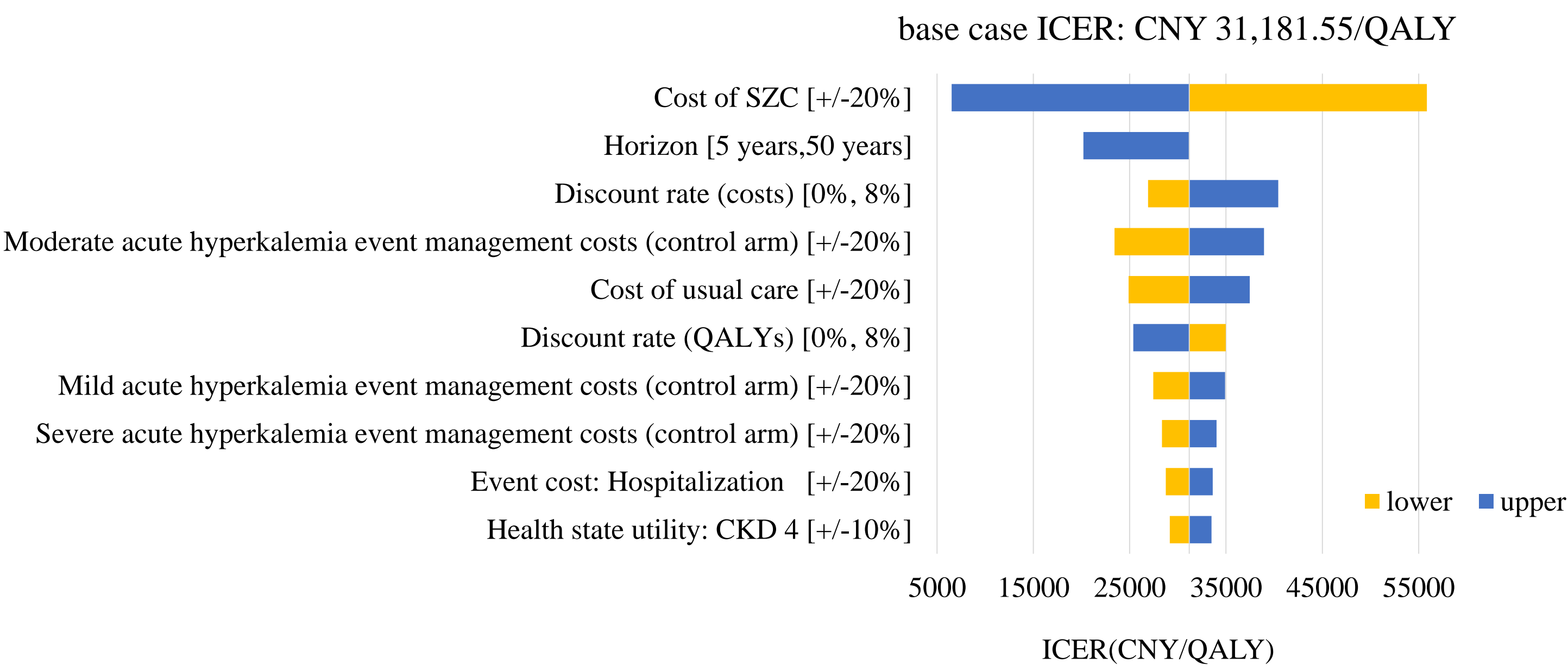


Figure 2. Tornado diagram: CKD cohort

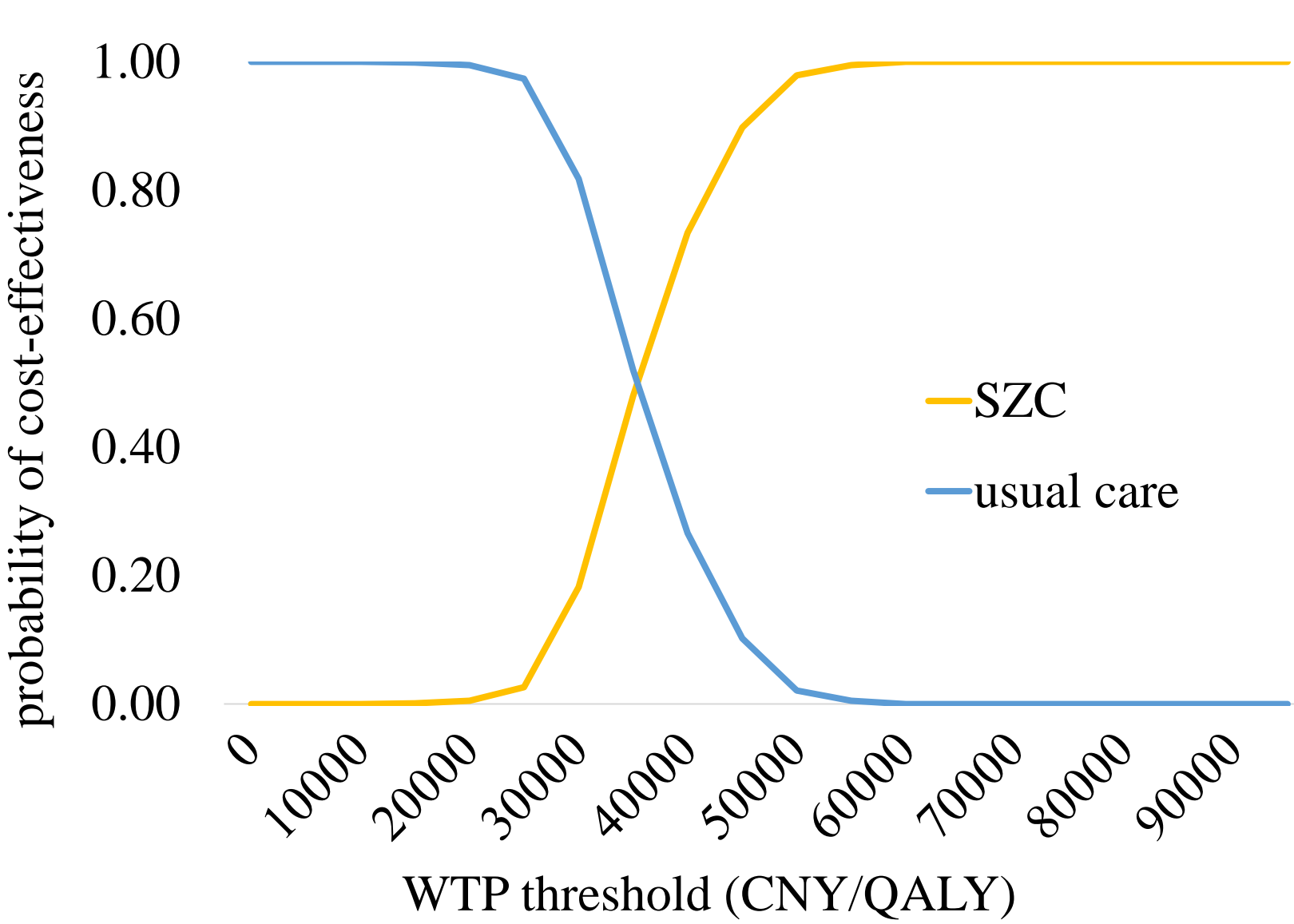


Figure 3. Cost-effectiveness acceptability curve : HF cohort

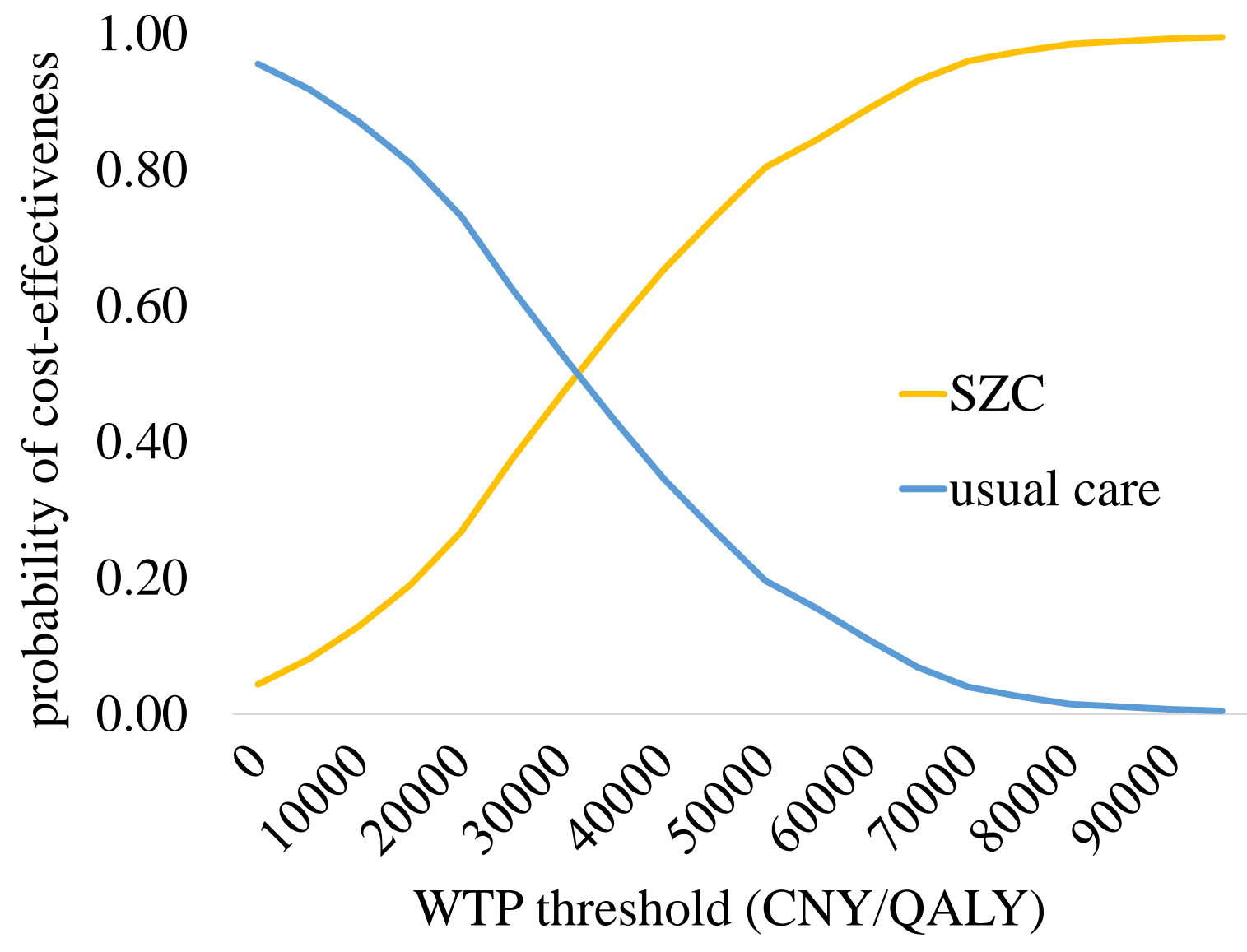


Figure 4. Cost-effectiveness acceptability curve : CKD cohort

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