



# Cost-Effectiveness Analysis of Axicabtagene Ciloleucel as a Second-line Treatment for Diffuse Large B-cell Lymphoma in China

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## Background and Objective

- Diffuse large B-cell lymphoma (DLBCL) is a hematologic malignancy originating from lymphoid tissues. In China, approximately 33,800 new cases are diagnosed annually.
- Due to high heterogeneity, about one-third of DLBCL patients relapse or progress to refractory disease after initial standard therapy. Precise diagnosis and individualized treatment are crucial to improve survival and quality of life.
- Axicabtagene ciloleucel (Axi-cel), the first Chimeric antigen receptor t-cell immunotherapy (CAR-T) product approved in China, is indicated for adults with r/r DLBCL after  $\geq 2$  lines of systemic therapy failure. However, its high cost has led to fourth unsuccessful medical insurance negotiations in 2024.
- Under the multidimensional value framework for innovative drugs, expanding pharmacoeconomic evaluation from a payer to a **societal perspective including productivity** may create new opportunities for patient access.
- This study aims to evaluate the cost-effectiveness of Axi-cel versus standard care (SC) in second-line treatment for r/r DLBCL from the perspectives of the Chinese health system and the whole society.

## Methods

### Interventions

- Axi-cel
- SC (R-ICE + R-GDP + R-DHAP + R-ESHAP)

### Model Structure

- A partitioned survival model (PSM)
- Cycle length: 3 weeks
- Discounting rate: 5% annually

### Model Inputs

- OS and PFS parameters: ZUMA-7
- Utilities: An EQ-5D-5L scale survey based on Chinese DLBCL patients
- Cost: ① From the health system perspective, **direct medical costs** were assessed based on public documents and literature; ② From the societal perspective, both **direct and indirect medical costs** were evaluated, with **productivity losses estimated using the human capital approach**.

### Statistical Analysis

- Lifetime incremental cost-effectiveness ratio (ICER) for r/r DLBCL patients were calculated using three times China's GDP in 2023 (RMB 268,074) as the willingness-to-pay (WTP) threshold.

### Sensitivity Analysis

- One-way and probabilistic sensitivity analysis (PSA) were conducted to assess the robustness of the base-case results.

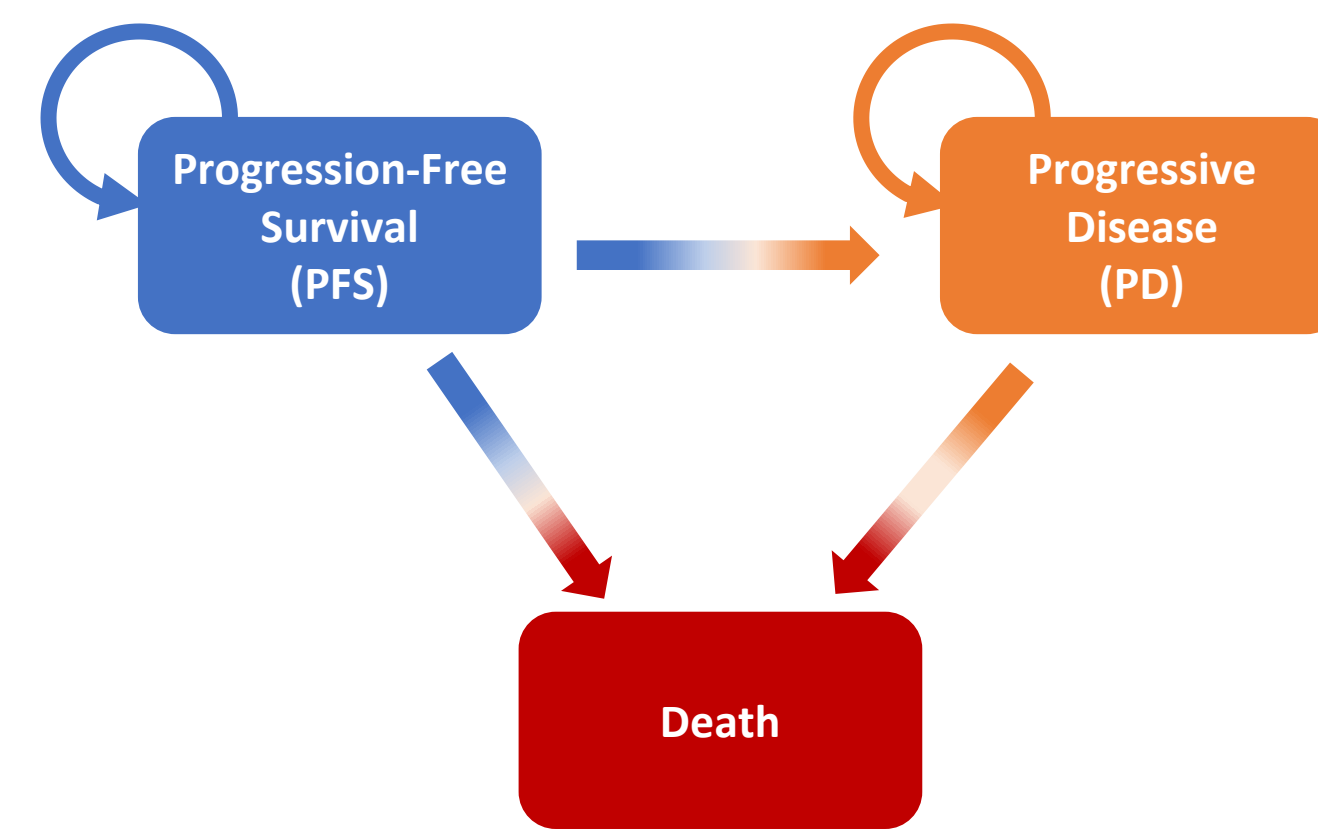


Figure1 PSM structure

## Results

### Base-case analysis results:

#### From the health system perspective:

- The ICER of Axi-cel was RMB 283,093.74 per QALY, **exceeded the WTP threshold**.

#### From the societal perspective:

- The ICER of Axi-cel was RMB 211,431.04 per QALY, **below the threshold**.

Table1 Base-case cost-effectiveness results

Results	Health system	Societal
<b>Total costs (RMB)</b>	1,189,637.01	1,243,766.71
<b>Total QALYs</b>	3.18	3.18
<b>Δcosts (RMB)</b>	436,078.05	325,688.71
<b>ΔQALYs</b>	1.54	1.54
<b>ICER</b>	283,093.74	211,431.04

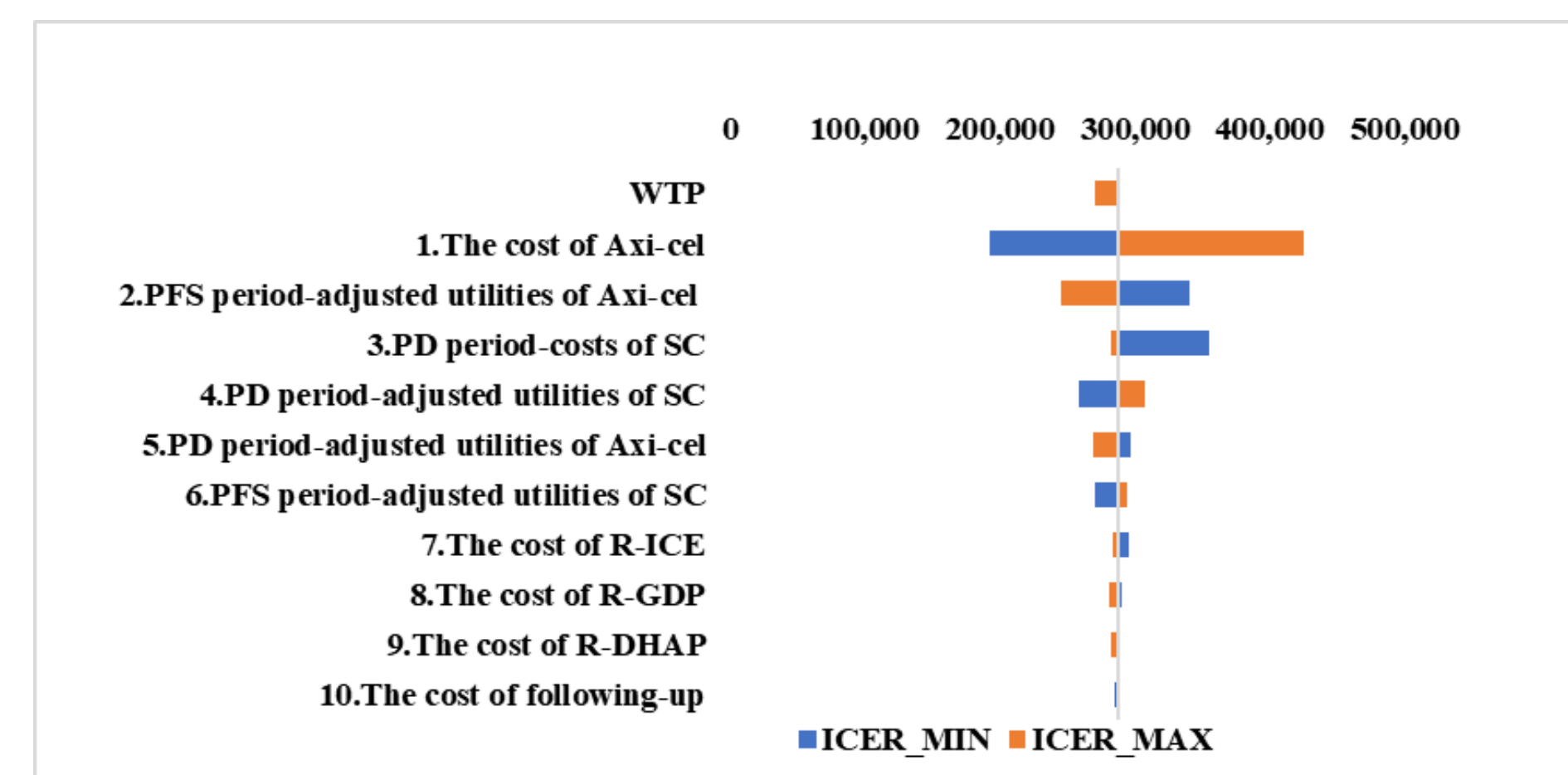
### Sensitivity analysis results:

#### From the health system perspective:

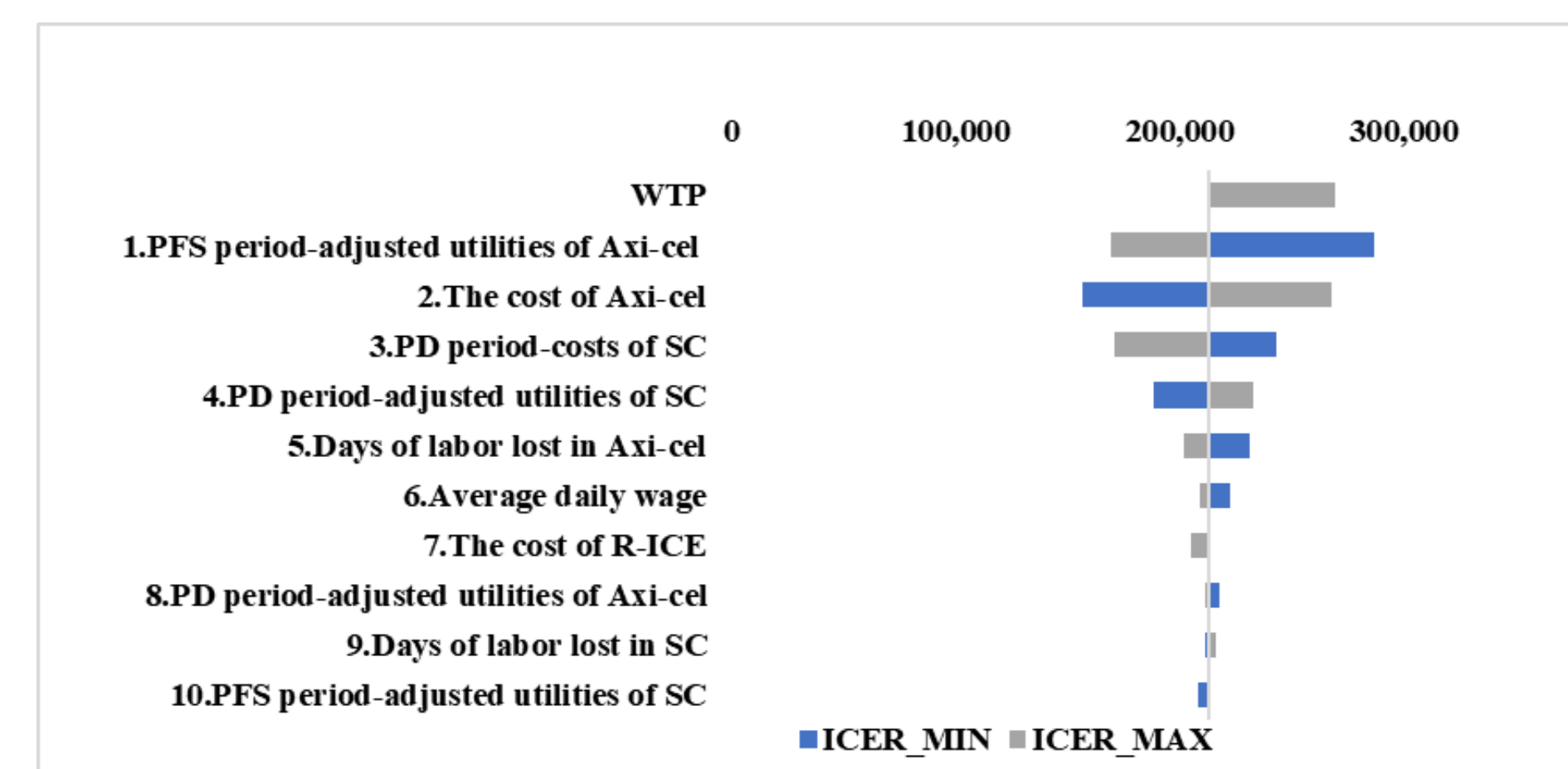
- The price of Axi-cel is the most critical factor that affects the results of the model. PSA results indicated that Axi-cel was cost-effective in 39% of 1,000 simulations.

#### From the societal perspective:

- The PFS period-adjusted utilities of Axi-cel is the most critical factor affecting the model results. PSA results showed Axi-cel to be cost-effective in 82% of simulations.



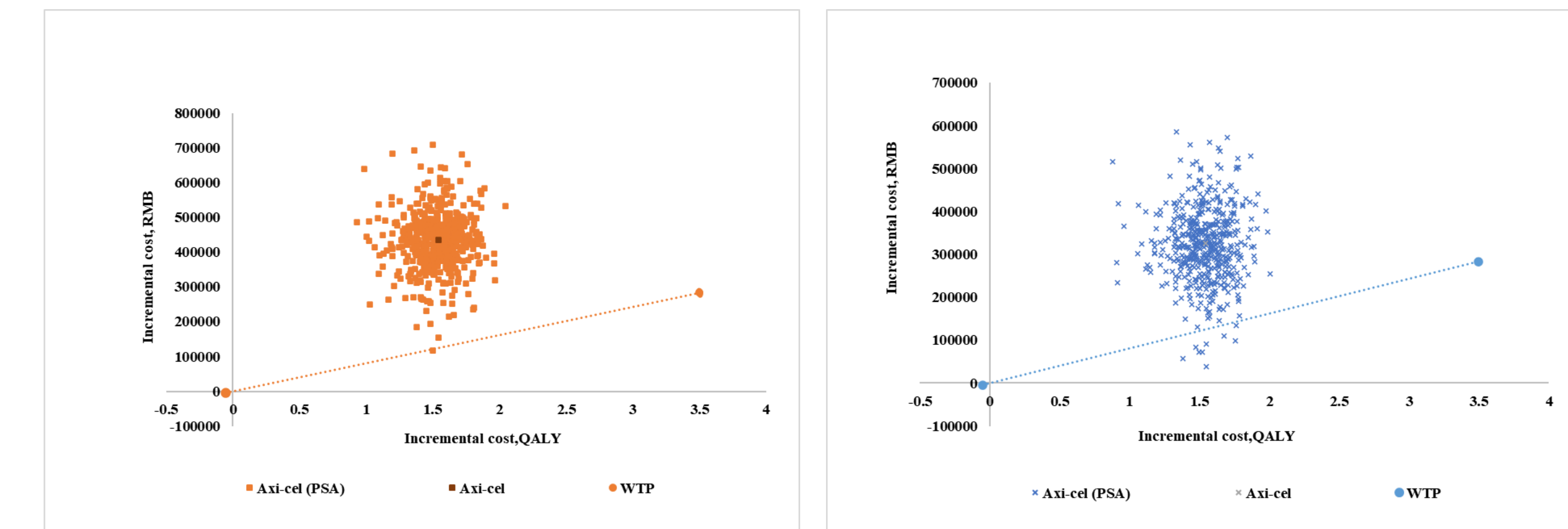
(a) Health system perspective



(b) Societal perspective

Figure2(a)(b) One-way sensitivity analysis

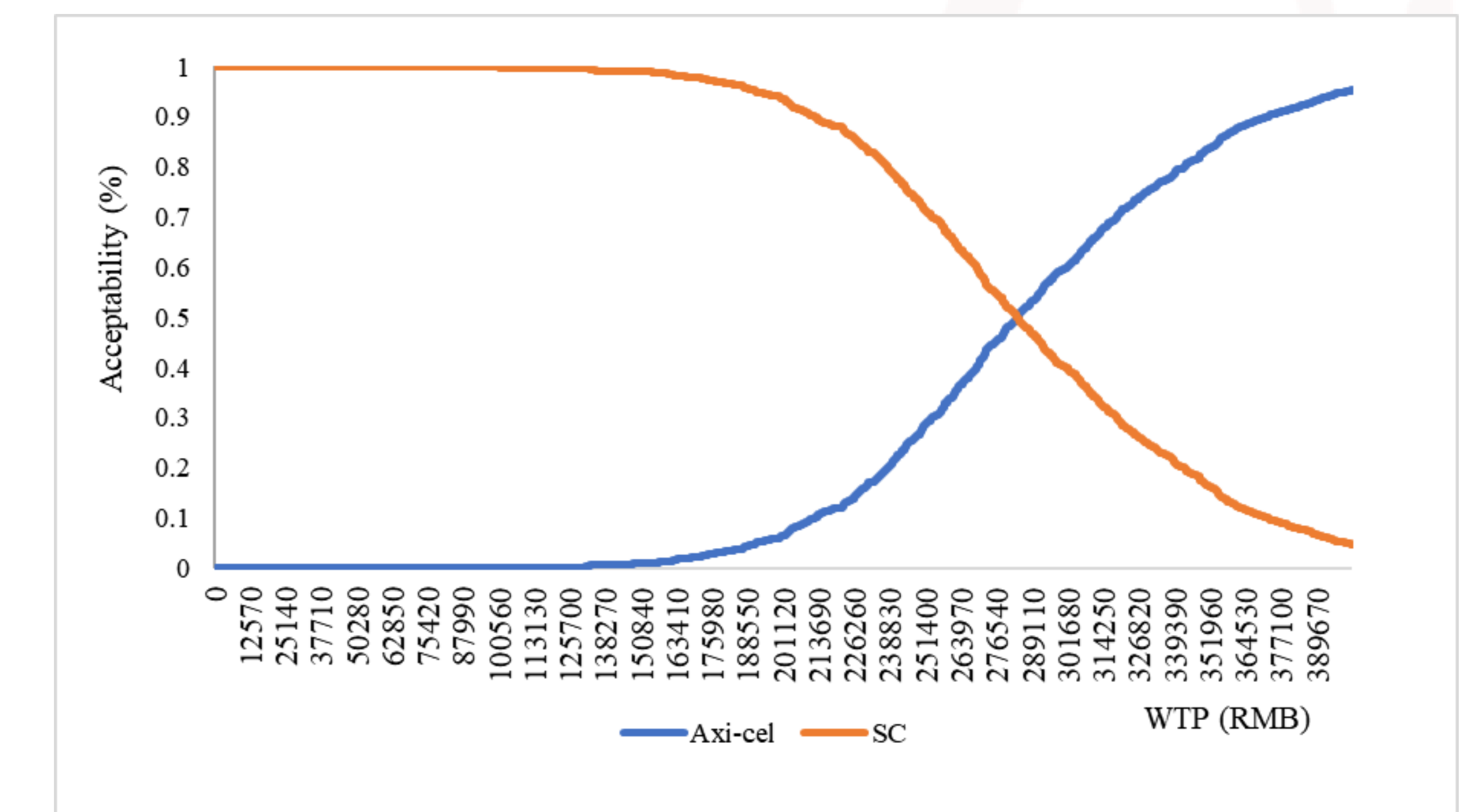
## Results



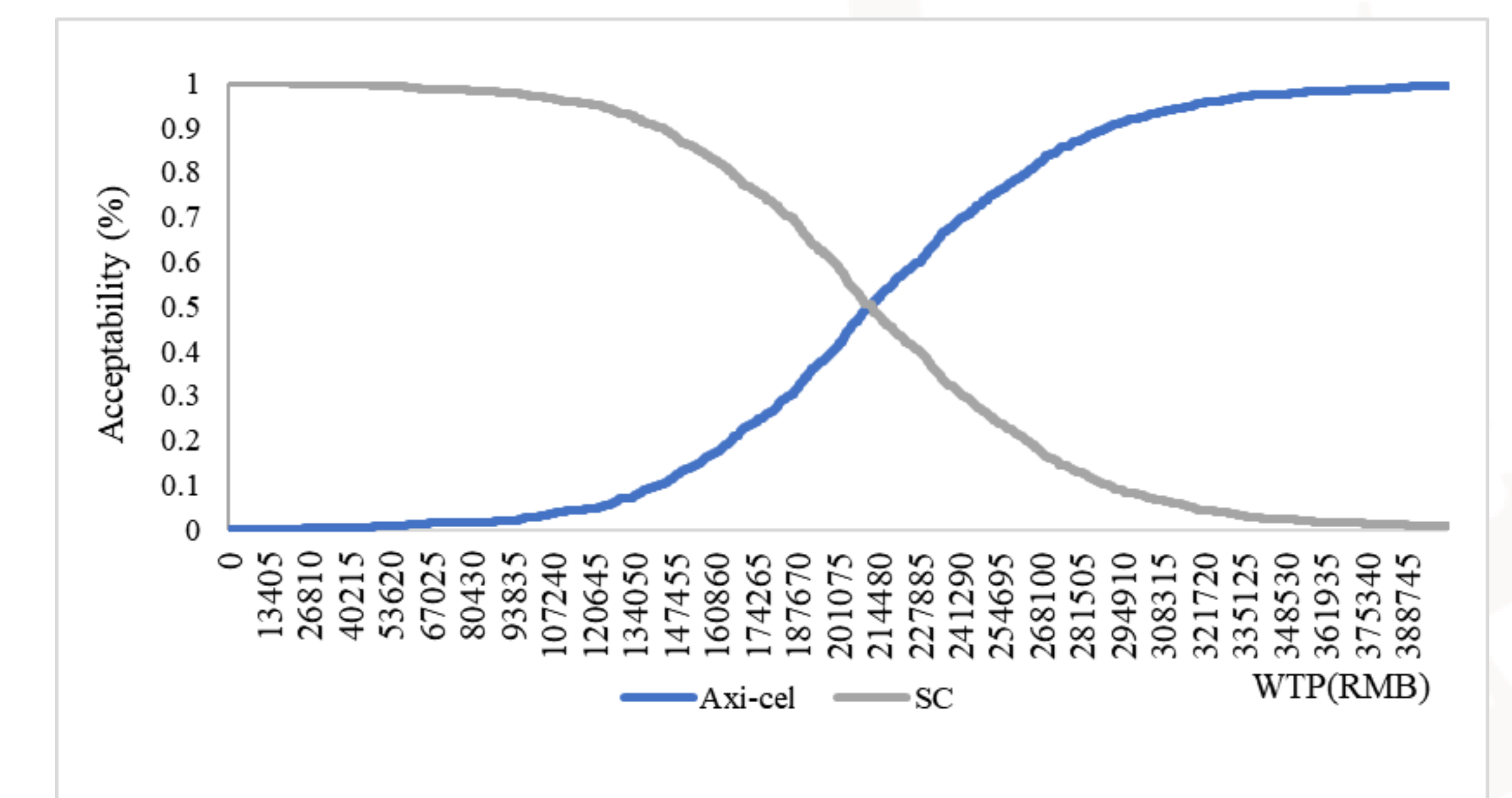
(a) Health system perspective

(b) Societal perspective

Figure3(a)(b) Probabilistic sensitivity analysis



(a) Health system perspective



(b) Societal perspective

Figure4(a)(b) Cost-effectiveness acceptability curve

## Conclusion

- From the Chinese health system perspective, Axi-cel is not cost-effective as second-line therapy for DLBCL. While considering the productivity value of gene therapy drugs, from the societal perspective, the economic evaluation of Axi-cel has shown a positive result.
- The result suggests that the access to high-value innovative drugs, represented by gene therapies, should consider a broader range of value dimensions.