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Abstract

Full Text

A network meta-analysis of second-line immune checkpoint inhibitors and docetaxel for advanced non-small cell lung cancer: An economic evaluation from China

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Abstract

Background: Although previous studies have compared the economic benefits of single immune checkpoint inhibitors (ICIs) and docetaxel, few studies have conducted detailed comparisons of different ICIs within China' s medical system. This study aimed to determine which of four ICIs—nivolumab, pembrolizumab, tislelizumab, and atezolizumab—was more cost-effective than docetaxel when used as second-line treatment for advanced non-small cell lung cancer (NSCLC) in China.

Methods: A network meta-analysis was performed based on seven randomized controlled trials to determine hazard ratios for progression-free survival (PFS)

and overall survival (OS). The economic assessment built a three-state partitioned survival model using Excel 2021 to simulate patient outcomes over a period of 10 years, with cycles every 3 weeks. The analysis was conducted from the perspective of China' s medical insurance payers, included direct medical expenses, and used a willingness-to-pay (WTP) threshold of $41,859 per QALY, equivalent to three times the per capita GDP of China in 2025. To ensure the reliability of the model results, deterministic sensitivity analysis and probabilistic sensitivity analysis were also performed to assess whether the results were stable.

Results: Among the four ICIs evaluated, tislelizumab achieved the highest QALYs (1.160) at a cost of $21,403.22, yielding the lowest incremental cost-effectiveness ratio (ICER) of $13,718.12/QALY compared to docetaxel. Nivolumab followed with an ICER of $160,444.64/QALY. Pembrolizumab and atezolizumab demonstrated ICERs of $344,114.24/QALY and $231,458.82/QALY, respectively. One-way sensitivity analysis identified drug cost as the most influential parameter on the ICER. Probabilistic sensitivity analysis (PSA) confirmed that tislelizumab had a 100% probability of being cost-effective at the base WTP threshold.

Conclusion: From the perspective of China' s medical system, tislelizumab is the most cost-effective second-line treatment for advanced non-small cell lung cancer based on current willingness-to-pay benchmarks.

Introduction

Lung cancer continues to impose a heavy burden on public health worldwide [1]. By 2022, the disease had reached approximately 2.5 million new diagnoses, accounting for 12.4% of all cancer cases, while also being responsible for 18.7% of cancer-related deaths worldwide [2,3]. Non-small cell lung cancer (NSCLC) is the predominant subtype, accounting for roughly 85% of all cases [4]. In China, lung cancer remains the leading cancer type, with an estimated 828,000 people receiving a new diagnosis

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Table 1

Results of network meta-analysis for PFS and OS (HR, 95% CL).

OS	OS	OS	OS	OS
Atezolizumab	1.24 (1.02, 1.51)	0.93 (0.63, 1.38)	0.89 (0.66, 1.21)	0.79 (0.54, 1.17)
0.81 (0.66, 0.98)	Docetaxel	0.75 (0.53, 1.05)	0.72 (0.57, 0.91)	0.64 (0.46, 0.89)
1.08 (0.73, 1.59)	1.33 (0.95, 1.87)	Nivolumab	0.95 (0.64, 1.45)	0.85 (0.53, 1.37)
1.13 (0.82, 1.51)	1.4 (1.1, 1.74)	1.05 (0.69, 1.56)	Pembrolizumab	0.89 (0.59, 1.32)
1.26 (0.86, 1.84)	1.56 (1.12, 2.17)	1.18 (0.73, 1.88)	1.12 (0.76, 1.68)	Tislelizumab
PFS	PFS	PFS	PFS	PFS
Atezolizumab	1.06 (0.9, 1.26)	0.83 (0.59, 1.18)	0.89 (0.69, 1.17)	0.67 (0.48, 0.94)
0.94 (0.79, 1.11)	Docetaxel	0.78 (0.58, 1.06)	0.84 (0.68, 1.03)	0.63 (0.47, 0.84)
1.21 (0.85, 1.7)	1.28 (0.95, 1.74)	Nivolumab	1.08 (0.74, 1.56)	0.81 (0.53, 1.23)
1.12 (0.86, 1.46)	1.19 (0.97, 1.46)	0.93 (0.64, 1.34)	Pembrolizumab	0.75 (0.53, 1.07)
1.5 (1.07, 2.08)	1.59 (1.19, 2.11)	1.24 (0.82, 1.88)	1.33 (0.94, 1.9)	Tislelizumab

and 657,000 losing their battle to the disease in 2022 alone 3. Consequently, NSCLC imposes a substantial health and economic burden on China.

A significant diagnostic challenge exists wherein many patients are identified only after the disease has progressed to an advanced stage, a situation frequently accompanied by diminishing therapeutic alternatives and an adverse prognosis. Historically, chemotherapy has been the standard second-line treatment; however, outcomes remain suboptimal 5. ICIs have revolutionized NSCLC therapy, markedly improving patient survival through targeted modulation of immune pathways to generate potent antitumor activity 6. Agents such as nivolumab, pembrolizumab, tislelizumab, and atezolizumab have demonstrated favorable clinical efficacy in second-line treatment settings 7.

Multiple randomized controlled trials support the view that immune checkpoint inhibitors (ICIs) are more effective than docetaxel in improving survival. For example, the CheckMate 017, 057 and 078 trials all found that nivolumab gave patients a significantly longer OS than docetaxel 8–10. OAK, POPLAR, and

IMpower210 studies have reached similar conclusions, demonstrating that atezolizumab completely wins overall survival 11–13. The KEYNOTE-010 trial showed that pembrolizumab increased median overall survival to 11.8 months, better than Doceticket's 8.4 months 14. In the KEYNOTE-033 trial, researchers specifically observed China patients and found that pembrolizumab reduced the risk of death by 25% compared to docetaxel (HR: 0.75) 15. In the RATIONAL-303 trial, tislelizumab also performed well, with a median OS more than 5 months longer than that of docetaxel 16. Finally, the ORIENT-3 study also demonstrated that sintilimab significantly improved OS (HR: 0.74; 95% CI: 0.50–0.96; P = 0.02489) 17.

The Chinese Society of Clinical Oncology guidelines recommend nivolumab and tislelizumab as first-tier ICIs and pembrolizumab and atezolizumab as second-tier options for second-line treatment of advanced NSCLC 18. Although several studies have assessed the cost-effectiveness of ICIs versus docetaxel, few have compared the economic outcomes of different ICIs. This study evaluated the economic aspects of different immune checkpoint inhibitors and their comparison with docetaxel. Such evaluations are crucial to inform healthcare policy, reduce patient financial burden, and guide efficient resource allocation within China' s healthcare system.

Method

Network Meta-Analysis

A systematic literature search targeted RCTs in PubMed, Web of Science, Embase, and the Cochrane Library. An initial systematic literature search was conducted with a publication date cutoff of December 31, 2024. To ensure the evidence base reflects the most current data at the time of manuscript revision, an identical updated search was performed in January, 2026 to cover studies published from January 1, 2025, to December 31, 2025. The combined results of these searches are presented in the PRISMA flow diagram (Supplemental Fig. 1). Commonly used search terms included "non-small cell lung cancer," "lung cancer," "nivolumab," "pembrolizumab," "tislelizumab," "sintilimab," "atezolizumab," "docetaxel," "immune checkpoint inhibitors," "PD-1 blockers," "PD-L1 inhibitors," and "immunotherapy" (**Supplementary File 1, Supplementary File 2**). Two independent investigators reviewed the titles and abstracts of all the retrieved articles. In cases of disagreement, a third reviewer was consulted to resolve discrepancies and achieve consensus.

Each randomized controlled trial included was assessed for risk of bias using the method written in the Cochrane Handbook for Systematic Reviews. 19. Key data extracted from each study included publication year, trial identifier, study design and phase, treatment arms, sample size, and clinical outcomes (Supplemental Fig. 2).

Eligible participants from the included trials received ICI therapy according to trial-specific protocols (Supplemental Table 1). The treatment regimens were

as follows: nivolumab was administered intravenously at 195 mg every two weeks; pembrolizumab at either 130 mg or 650 mg on a three-week schedule; tislelizumab administered at 200 mg every three weeks; atezolizumab at 1200 mg with the same frequency; and docetaxel at 129 mg also every three weeks. All patients were diagnosed with advanced or metastatic NSCLC and showed disease progression, requiring systemic therapy. The trial records were used to estimate the proportion of patients who received subsequent treatment.

A network meta-analysis was carried out using R version 4.4.1, applying a Bayesian framework to the consistency model. The analysis used four chains with an adaptation phase of 50,000 iterations (n.adapt) and 100,000 iterations (n.iter) (Table 1) 20. The docetaxel arm from the OAK trial, chosen for its large sample size and extended follow-up period, served as the reference group. Pseudo-individual patient data for the docetaxel cohort were generated by applying the algorithm developed by Guyot et al. This reconstruction was based on OS and PFS Kaplan-Meier curves that had been digitally extracted using Engauge Digitizer software 21.

These reconstructed data were fitted to seven different survival distributions and the best-fitting model was selected based on the lowest Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) values. Ultimately, the log-logistic distribution was selected to model both the OS and PFS (Table 2, Supplemental Fig. 3).

Construction of Partition Survival Model

A partitioned survival model with three health states—PFS, progressive disease (PD), and death—was developed to evaluate the cost-effectiveness of different ICIs (Fig. 1). The model was constructed using Microsoft Excel 2021. A three-state partitioned survival model was employed for the cost-effectiveness analysis in this study, primarily based on the following considerations. First, this model allows for the direct application of progression-free survival and overall survival data extracted from clinical trial Kaplan-Meier curves. This approach

Table 2
AIC and BIC for OS and PFS of the baseline docetaxel group.

	OS in docetaxel AIC	OS in docetaxel BIC	PFS in docetaxel AIC	PFS in docetaxel BIC
exponential	3299.724	3304.141	2990.09	2994.507
gamma	3296.902	3305.736	2976.174	2985.007
gompertz	3293.282	3302.115	2957.55	2966.384
weibull	3274.033	3282.867	2900.479	2909.313
loglogistic	3297.483	3306.316	2900.64	2909.473
lognormal	3301.458	3310.291	2991.441	3000.275
gengamma	3283.913	3297.163	2901.465	2914.715

Fig. 1. The three-state health model.

obviates the need for complex estimation of transition probabilities between health states (e.g., from PFS to progressed disease [PD]), thereby simplifying the modeling process. Furthermore, the partitioned survival model aligns well with the data structure of our analysis. It directly utilizes the extrapolated survival curves from our network meta-analysis (NMA) to partition a hypothetical cohort into the three health states of progression-free, progressed disease, and death over time. This provides a transparent and intuitive method for estimating the long-term distribution of patient outcomes after second-line treatment ends. Given that our comparative efficacy inputs are derived from an NMA of published trial data, the model' s reliance on aggregated survival data (rather than complex microsimulation) enhances the reproducibility of our evaluation and is a well-established approach in health technology assessments for oncology.

Our analysis compared two hypothetical cohorts, identical at baseline, starting from the PFS state upon failure of first-line treatment—a common starting point informed by the included clinical trials. To align with the trial protocols and drug administration schedules underpinning our network meta-analysis, we structured the model using 3-week cycles. A 10-year simulation horizon was selected to comprehensively account for potential long-term differences in survival, quality of life, and costs between the compared immunotherapies and docetaxel from the Chinese healthcare payer perspective.

The key outcomes assessed included total cost, QALYs, and ICERs. To align with established methodological guidelines, a half-cycle correction was implemented as a standard practice to improve the accuracy of the economic evaluation 22. The WTP threshold was set at three times the Chinese per capita GDP in 2025, which served as a benchmark for determining cost-effectiveness.

Cost and Utility Data

This study investigated the economic pressures on the medical industry in China and analyzed direct medical costs, including the cost of drugs, treatment-related adverse events (TRAEs), and the cost of best supportive care (BSC)(Table 3). In order to ensure reliable data, drug prices are obtained from official procurement records of the China government 23.

When calculating the dose of each compound, we used an average body weight of 65 kg and a body surface area of 1.72 m^2 in accordance with the previous NSCLC health economic study 24. The costs of BSC, routine monitoring, and management of adverse events were extracted from the published literature. All financial data is updated to the 2025 dollar value, converted using the China Consumer Price Index and the exchange rate of 1 dollar equal to RMB 7.251706583.

Health utilities were assigned to PFS and PD states based on values reported in the literature. Utility decrements due to adverse events of grade 3 or higher were calculated by multiplying the incidence of each event by its associated

disutility. Only the three most frequent adverse events per treatment arm were considered. We followed the Chinese pharmacoeconomic evaluation guidelines and discounted medical expenses and QALYs at a rate of 5% per year 26.

Sensitivity Analysis

A one-way sensitivity analysis was performed to assess parameter uncertainty. This involved varying key model inputs by ± 20% from their baseline values and adjusting the discount rate across a range of 0–8%. This was done to assess the impact on the ICER. This method identified the parameters that had the greatest influence on the cost-benefit results.

To account for parameter changes, we used Monte Carlo simulations to do PSA. Probability distributions were assigned to each input variable based on the available data, and 1000 iterations were performed to generate a distribution of ICERs.

Results

Cost-Effectiveness Analysis

Seven randomized controlled trials were included, covering four ICIs: nivolumab, tislelizumab, atezolizumab and pembrolizumab (Table 4). Among these treatment options, tislelizumab yielded the highest QALYs (1.160), followed by nivolumab (0.939), pembrolizumab (0.936), atezolizumab (0.819), and docetaxel (0.647). The total treatment cost was as follows: tislelizumab ($21,403.22), nivolumab ($61,269.61), pembrolizumab ($113,875.11), atezolizumab ($54,228.03), and docetaxel ($14,372.37). Compared to docetaxel, the ICERs were nivolumab: $160,444.64/QALY, tislelizumab: $13,718.12/QALY, pembrolizumab: $344,114.24/QALY, and atezolizumab: $231,458.8247/QALY. The incremental net monetary benefits (INMBs), calculated at a WTP threshold of $41,859/QALY were nivolumab, −$42,818.84, tislelizumab, $120.38, pembrolizumab: −$95,468.15; and atezolizumab, −$37,453.

Overall, tislelizumab demonstrated the most favorable cost-effectiveness profile among all ICIs evaluated, with the highest QALY, lowest ICER, and greatest INMB relative to docetaxel.

Sensitivity Analysis Results

In the deterministic sensitivity analysis (DSA), tornado diagrams were used to illustrate the impact of varying key parameters on the ICER across treatment strategies (Supplemental Fig. 4). The parameters with the greatest influence on ICER were drug cost, utility values for PFS and PD states, and discount rate.

To graphically represent the probability of cost-effectiveness, a cost-effectiveness acceptability curve was generated within the PSA framework, illustrating the comparative performance of each treatment strategy at varying WTP thresholds. (Fig. 2). At a WTP threshold of $13,953/QALY (based on China' s 2025 GDP

per capita), the probability that tislelizumab is the most cost-effective option reached 55.7%. At a higher WTP threshold of $41,859/QALY (three times the base threshold), tislelizumab remained the preferred option in 100% of the simulations. The probability of nivolumab and pembrolizumab use was 0.0%.

Table 3
Input parameters.

Parameters	Baseline value	Low	High	Distributions	Reference
Docetaxel survival model					
Log-logistic distribution (OS)	Shape = 1.499, Scale = 10.172				27
Log-logistic distribution (PFS)	Shape = 1.877, Scale = 3.638				27
Cost (2025					
)(*percycle*)|||||||*nivolumab*|4179.15|3343.32|5014.98|*Gamma*|23||*pembrolizumab*|9638.65|7710.92|11566.38|*Gam*					
up|55.6|44.48|66.72|*Gamma*|38||*bestsupporttreatment*|337.5|270|405|*Gamma*|28||*subsequenttreat*|854.1|683.28					
anemia	531.7	425.36	638.04	Gamma	30
neutropenia	461.5	369.2	553.8	Gamma	38
rash	5.5	4.4	6.6	Gamma	28
diarrhea	150	120	180	Gamma	38
decrease appetite	115	92	138	Gamma	31
nausea	71	56.8	85.2	Gamma	31
fatigue	115.4	92.32	138.48	Gamma	38
asthenia	115.4	92.32	138.48	Gamma	38
ALT increased	71.06	56.85	85.27	Gamma	32
AST increased	71.06	56.85	85.27	Gamma	32
febrile neutropenia	1145	916	1374	Gamma	33

Parameters	Baseline value	Low	High	Distributions	Reference
Probabilities of TRAE with docetaxel					
Febrile neutropenia	0.107	0.0856	0.1284	Beta	11
fatigue	0.04	0.032	0.048	Beta	11
neutropenia	0.13	0.104	0.156	Beta	11
anemia	0.057	0.0456	0.0684	Beta	11
Probabilities of TRAE with Pembrolizumab					
fatigue	0.015	0.012	0.018	Beta	14
decrease appetite	0.007	0.0056	0.0084	Beta	14
anemia	0.006	0.0048	0.0072	Beta	14
asthenia	0.006	0.0048	0.0072	Beta	14
Probabilities of TRAE with Nivolumab					
rash	0.009	0.0072	0.0108	Beta	10
fatigue	0.009	0.0072	0.0108	Beta	10
neutropenia	0.006	0.0048	0.0072	Beta	10
Probabilities of TRAE with Tislelizumab					
ALT increased	0.009	0.0072	0.0108	Beta	17
AST increased	0.007	0.0056	0.0084	Beta	17
anemia	0.009	0.0072	0.0108	Beta	17
diarrhea	0.004	0.0032	0.0048	Beta	17
decrease appetite	0.002	0.0016	0.0024	Beta	17

Parameters	Baseline value	Low	High	Distributions	Reference
asthenia Probabilities of TRAE with Atezolizumab	0.002	0.0016	0.0024	Beta	17
fatigue	0.028	0.0224	0.0336	Beta	11
anemia	0.023	0.0184	0.0276	Beta	11
discounted Utility	0.05	0	0.08	Beta	
PFS	0.804	0.6432	0.9648	Beta	25
PD	0.321	0.2568	0.3852	Beta	25
Decreased utility					
fatigue	0.07	0.056	0.084	Beta	25
decrease appetite	0.07	0.056	0.084	Beta	31
anemia	0.078	0.0624	0.0936	Beta	36
asthenia	0.078	0.0624	0.0936	Beta	36
rash	0.1	0.08	0.12	Beta	25
neutropenia	0.2	0.16	0.24	Beta	25
ALT increased	0.12	0.096	0.144	Beta	32
AST increased	0.12	0.096	0.144	Beta	32
diarrhea	0.07	0.056	0.084	Beta	25
Febrile neutropenia	0.42	0.336	0.504	Beta	25
Subsequent treatment rate					
nivolumab	0.45	0.36	0.54	Beta	34
tislelizumab	0.555	0.444	0.666	Beta	17
atezolizumab	0.5	0.4	0.6	Beta	13
docetaxel	0.619	0.4952	0.7428	Beta	13
Pembrolizumab	0.39	0.312	0.468	Beta	14

Table 4
Baseline results.

Regimen	Cost	QALYs	ICER: Docetaxel	ICER: Tislelizumab	ICER: Nivolumab	ICER: Pembrolizumab	ICER: Atezolizumab	INMB	Economics probability (%)
Docetaxel	14372.37	0.647	/	/	/	/	/	/	0.00
Tislelizumab	21403.22	1.160	13718.1198	/	/	/	/	120.3814	100.00
Nivolumab	61269.61	0.994	16044.6392	-181024.0538	/	/	/	-42818.84	0.00
Pembrolizumab	128751.10	0.936	344114.2392	-414399.1967	-967574.8121	/	/	-59686.15	0.00
Atezolizumab	54228.03	0.8193	231458.8247	-964501.1487	-58629.9737	-307966.1034	/	-337453	0.00

Overall, both DSA and PSA demonstrated the reliability of the base-case results, supporting that tislelizumab is the most cost-effective second-line treatment option under the current model assumptions.

Discussion

In clinical practice, especially in grassroots medical institutions or areas with limited resources, the precise diagnosis of pathological types often suffers from delays or omissions. Clinical decisions are more reliant on treatment evidence from patients with advanced NSCLC. Most existing network meta-analyses distinguish between pathological subtypes, and there is a lack of comparative evidence for immunotherapy regimens for patients with NSCLC without distinguishing between squamous and non-squamous cell carcinoma. This makes it impossible to determine which immune checkpoint inhibitor regimen is superior when no pathological type is available. There are also significant differences in efficacy, safety, and cost among different ICIs and treatment regimens. Moreover, in clinical practice, some patients cannot clearly distinguish between squamous NSCLC and non-squamous NSCLC. Therefore, research specifically targeting this population is urgently needed to guide clinical decisions.

This study represents a comprehensive cost-effectiveness evaluation comparing nivolumab, tislelizumab, pembrolizumab, and atezolizumab with docetaxel for second-line treatment of advanced NSCLC. These findings provide valuable insights for optimizing healthcare resource allocation and guiding evidence-based decision-making within the Chinese healthcare system.

The 7 clinical trials included in this study shared a high degree of similarity in their main design. All were randomized controlled trials. The patients were all patients with advanced NSCLC. The experimental groups all received immune checkpoint inhibitors, while the control groups received docetaxel. The outcome indicators included OS and PFS. This study also has some inconsistencies.

Specifically, the RATIONALE-303 clinical trial included relatively severely ill patients, while the other trials included patients with mild to moderate conditions. Patients with a greater disease burden typically have a poorer prognosis, which may pose a challenge when comparing the absolute survival benefit observed in RATIONALE-303 with the results from other trials.

A cost-benefit analysis of four immunotherapy drugs showed that tislelizumab was the most affordable option, providing the highest QALYs and the best economic benefits of all evaluated options. Other ICIs—nivolumab, pembrolizumab, and atezolizumab—failed to meet the cost-effectiveness benchmark under China' s existing willingness-to-pay standards.

In DSA analysis, drug expenses became the most important factor affecting ICER value. In addition, PSA results show that the probability that tislelizumab will become the most cost-effective treatment is directly linked to the WTP threshold. Conversely, as the threshold increases, the cost-effectiveness possibilities of docetaxel have been declining. The results of these sensitivity analyses added together further proved the reliability of the results of the basic case and made the conclusions of the model more convincing.

With the rapid advancement of immunotherapy, growing attention is being directed toward ICIs for NSCLC management. Our findings align with existing economic evaluations, which have consistently indicated that atezolizumab in combination with chemotherapy is not a cost-effective alternative to docetaxel within the Chinese healthcare context 35. Similarly, studies applying partitioned survival models to compare tislelizumab and docetaxel have confirmed the economic viability of tislelizumab 36. Comparative analyses involving tislelizumab and nivolumab also concluded that tislelizumab offers superior economic value 37. Meanwhile, studies evaluating pembrolizumab versus docetaxel have indicated that the current price of pembrolizumab must be reduced to achieve cost-effectiveness 38.

Fig. 2. Cost-effectiveness acceptability curve.

Our analysis identifies tislelizumab as the dominant cost-effective choice among second-line ICIs for advanced NSCLC in China, with an ICER well below the WTP threshold. These findings carry direct implications for healthcare decision-making. For national health insurance authorities, the robust cost-effectiveness evidence strengthens the case for prioritizing tislelizumab during negotiations for the National Reimbursement Drug List (NRDL) updates, potentially facilitating broader patient access to this domestically produced agent. For hospital administrators and clinicians, especially in settings where rapid, precise histologic subtyping is not feasible, our results offer a clear economic rationale for incorporating tislelizumab into standardized clinical pathways as the preferred second-line ICI option. While model-based, our conclusions underscore the value of tislelizumab; subsequent analyses using real-world data on treatment patterns and outcomes are warranted to confirm its economic performance in routine practice.

Several limitations should be considered when interpreting our findings. The foremost limitation arises from our use of network meta-analysis. By synthesizing evidence from separate RCTs, we indirectly compared treatments that were not head-to-head in clinical trials. Although we aimed for clinical homogeneity, inconsistencies in baseline factors—most notably PD-L1 expression, ethnic composition, and ECOG scores—persisted across trials. This residual heterogeneity could confound the efficacy estimates, especially for tislelizumab, and is the principal driver of uncertainty in our cost-effectiveness results. Additional methodological constraints include: disparate follow-up times and treatment durations among source trials, which complicate long-term extrapolation; the use of a uniform $±$20% variation in deterministic sensitivity analyses in the absence of published parameter distributions; and the reliance on utility values from external literature rather than trial-specific quality-of-life data. Furthermore, our study scope deliberately excluded trials enrolling only squamous or non-squamous subtypes to maintain a mixed population focus, which may limit applicability to purely subtype-specific decisions. Lastly, as with all model-based evaluations, our reliance on RCT data means findings may not fully capture effectiveness and costs in heterogeneous real-world populations.

Conclusion

Based on the results of this economic review, tislelizumab is a cost-effective second-line treatment option in the China medical system for patients with advanced non-small cell lung cancer, using a willingness to pay $41,859/QALY.

CRediT authorship contribution statement

Yunfeng Zhao: Writing –original draft, Software, Investigation, Formal analysis, Conceptualization. **Fanyu Meng:** Writing –original draft, Validation, Investigation, Data curation. **Fenghao Shi:** Supervision, Methodology, Data curation. **Linbo Zhao:** Visualization, Resources, Project administration, Conceptualization. **Yi Zhang:** Writing –review & editing, Supervision. **Shuang Liu:** Visualization, Project administration, Conceptualization. **Jianhua Tang:** Writing –review & editing, Supervision.

Express consent

This section does not apply to current research.

Ethics approval

As a health economic modeling study based on published literature, ethical approval was not required.

Availability of data and materials

Data supporting the results of this study can be found in the article itself and its supplementary materials.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.prmedi.2026.100092.

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