Atezolizumab compared to chemotherapy for first-line treatment in non-small cell lung cancer with high PD-L1 expression: a cost-effectiveness analysis from US and Chinese perspectives

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Background: The IMpower110 trial revealed that atezolizumab treatment had significantly longer overall survival (OS) than chemotherapy in non-small cell lung cancer (NSCLC) patients with high-programmed death ligand 1 (PD-L1) expression. The purpose of the present study was to estimate the cost-effectiveness of atezolizumab versus platinum-based chemotherapy for first-line treatment in metastatic NSCLC with high PD-L1 expression, from the perspective of US and Chinese payers.

Methods: A partitioned survival model was constructed based on information from the IMpower110 clinical trial to estimate cost-effectiveness of atezolizumab versus chemotherapy as first-line treatment of metastatic NSCLC. Costs were estimated from US and Chinese payer perspectives. The impact of uncertainty was explored by performing one-way and probabilistic sensitivity analyses.

Results: In the United States, treatment with atezolizumab was estimated to increase 0.87 quality adjusted life years (QALYs) at a cost of $123,424/QALY. In China, the use of atezolizumab cost an additional $68,489 compared with chemotherapy, yielding an incremental cost-effectiveness ratio (ICER) of $78,936/QALY. Sensitivity analysis indicated that the cost of atezolizumab was the most influential factor in both countries.

Conclusions: In the United States, which had a willingness-to-pay (WTP) threshold of $100,000 to $150,000 per QALY, atezolizumab was a cost-effective strategy for first-line treatment in metastatic NSCLC patients with high PD-L1 expression when compared to chemotherapy. For China, with a WTP threshold of $33,210 per QALY, atezolizumab was not considered good-value treatment for NSCLC, and a price reduction of 52% appeared to be justified.

Keywords: Cost-effectiveness; atezolizumab; non-small cell lung cancer (NSCLC); United States; China

Introduction

Lung cancer is the second most commonly diagnosed cancer and the leading cause of cancer-related deaths worldwide (1). Approximately 80% of all lung cancer cases are non-small cell lung cancer (NSCLC). A large proportion of patients are diagnosed at a metastatic stage (57%), and their 5-year relative survival rate is only 6% (2).

Prior to the introduction of immune check-point inhibitors (ICIs), platinum-based chemotherapy was the first-line treatment for metastatic NSCLC patients without epidermal growth factor receptor (EGFR) or anaplastic lymphoma kinase (ALK) positive tumor mutations (3).

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In recent years, the emergence of ICIs has changed the treatment paradigm of metastatic NSCLC, and some ICIs, such as pembrolizumab, have already been widely used in clinical practice as a new standard of care (4).

Atezolizumab is an immunoglobulin G1 (IgG1) monoclonal antibody that binds to programmed death ligand 1 (PD-L1) on tumor cell surfaces and reactivates T cell antitumor functions by blocking interactions between PD-L1 and programmed death 1 (PD-1) (5). PD-L1 antibody was proved to induce durable tumor regression and prolonged stabilization of disease in NSCLC patients (6). The IMpower110 trial (7) demonstrated that atezolizumab treatment resulted in significantly longer OS than chemotherapy in NSCLC patients with high PD-L1 expression (PD-L1 expression on at least 50% of tumor cells or at least 10% of tumor-infiltrating immune cells as assessed), regardless of histologic type. Moreover, atezolizumab showed a manageable safety profile with a lower frequency of grade 3–4 treatment related adverse event (AE) than chemotherapy despite longer exposure. Based on this result, the US Food and Drug Administration (FDA) approved atezolizumab for first-line treatment of metastatic NSCLC with high PD-L1 expression (8). In China, the National Medical Products Administration (NMPA) approved the application of atezolizumab for first-line treatment of NSCLC on April 29, 2021 (9). These made atezolizumab the second ICI after pembrolizumab and first PD-L1 monotherapy in the treatment of high PD-L1 expression NSCLC.

Although the use of atezolizumab results in significant survival gains for NSCLC compared with chemotherapy, whether its cost reflects its potential benefit remains unknown. This study is the first economic investigation of atezolizumab for first-line treatment of NSCLC, from a US and Chinese perspective. The objective of our study was to evaluate the cost-effectiveness of atezolizumab versus platinum-based chemotherapy for first-line treatment in metastatic NSCLC with high PD-L1 expression. We present the following article in accordance with the CHEERS reporting checklist (available at https://dx.doi.org/10.21037/atm-21-4294).

Methods

We developed a partitioned survival model to evaluate the cost-effectiveness of using atezolizumab versus platinum-based chemotherapy in the first-line treatment of NSCLC. The outcomes were total cost, life-years (LYs), quality-adjusted LYs (QALYs), and incremental cost-effectiveness ratios (ICERs). A willingness-to-pay (WTP) threshold of $100,000 to $150,000 per QALY (10) and $33,210 per QALY (3 times the gross domestic product per capita of China in 2020) were applied to the United States and China, respectively. A 3% annual discount rate was employed for both costs and outcomes (11). Statistical analysis was performed using R software (version 3.6.3, http://www. r-project.org).

Population and interventions

Medical information was derived from the IMpower110 trial (6). Patients with stage IV NSCLC who had not previously received chemotherapy were randomly assigned in a 1:1 ratio to receive either atezolizumab (1,200 mg intravenously, maximum 35 cycles) or platinum-based chemotherapy (once every 3 weeks, 4 or 6 cycles) (Table S1). Chemotherapy dosing was calculated for the model based on body surface area (United States, 1.8 m^2, 70 kg; China, 1.72 m^2, 65 kg) and creatinine clearance of 70 mL/minute (12,13).

According to the IMpower110 trial, the proportion of patients who received at least 1 subsequent anticancer therapy was 29.6% in the atezolizumab arm and 49.5% in the chemotherapy arm. The distribution of subsequent therapies was based on data from the IMpower110 trial; subsequent therapy details are shown in Table S2. The duration of subsequent therapy was 2.7 months, based on a real-world retrospective study (14). Following treatment, patients received best supportive care until death. A 20-year time horizon was selected to accommodate patient life expectancy.

Model structure

The partitioned survival model was developed using TreeAge Pro 2021 software (TreeAge Software, Williamstown, Massachusetts, USA) with 3 mutually independent health states: progression-free survival (PFS), progressive disease (PD), and death (*Figure 1*). In this model, the proportion of patients in each health state at a certain time point was calculated based on the two survival curves of PFS and OS, with the advantages of incorporating the time-varying therapeutic effect naturally and no requirements for estimating transition probabilities (15).

PFS and OS curves for atezolizumab and chemotherapy treatment were based on the results of the IMpower110
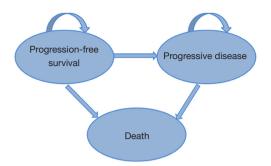
Figure 1 Model structure and transitions.

trial. Kaplan-Meier data were extracted by GetData Graph Digitizer (version 2.26; http://www.getdata-graph-digitizer. com), and time-to-event data were generated using the algorithm described in the study of Guyot *et al.* (16). Among the log-logistic, exponential, lognormal, generalized gamma, and Gompertz distributions, the best fit for the PFS and OS data of the atezolizumab arm was Weibull distribution, according to Akaike information criterion (AIC), Bayesian Information Criterion (BIC), and visual inspection. Log-logistic distribution fit the chemotherapy arm PFS and OS curves best, based on the same method (Figure S1).

Cost and utility estimates

Only direct medical care costs were covered in this model, including drug costs, administration costs, the cost of immunohistochemical testing, the cost of AE management, follow-up costs, best supportive care costs, and terminal care costs. Costs were estimated from US and Chinese payer perspectives. For the United States, drug costs were estimated using 2021 average sale pricing from the Centers for Medicare and Medicaid Services (17). Administration costs and follow-up costs were estimated based on the 2021 Medicare physician fee schedule (18). For China, all drug and administration costs were derived from Xiangya Hospital, Central South University and converted to US dollars with an exchange rate of $1 = RMB 6.5443.

We included severe AEs (higher than grade 3) that occurred in more than 5% of the patients in the model (Table S3). For the United States, AE costs were derived from previously published studies (19,20), and for China, they were calculated based on local charges. Best supportive care and terminal care costs were sourced from the literature (21-23). The Consumer Price Index was used

to adjust costs for inflation to reflect 2021 US dollars. All information regarding costs is listed in *Table 1*.

Utility values were applied to reflect the impact of the disease on health states and were measured by patient preference for living at a particular health state, in which 0 represents the worst health and 1 the best. The utility data used in the model (*Table 2*) were obtained from previously published articles (24-27).

Sensitivity analysis

We conducted one-way sensitivity analysis to identify the key factors that influence cost-effectiveness. Variable ranges were obtained from the best available evidence; otherwise, a variance of ±20% of base-case values was employed. Probabilistic sensitivity analysis was conducted by running 10,000 Monte Carlo simulations to test the uncertainty of the model with all parameters simultaneously varied within a specific pattern of distribution (*Tables 1,2*). As proposed by the Professional Society for Health Economics and Outcomes Research (ISPOR)-Society for Medical Decision Making (SMDM) Modeling Good Research Practices Task Force (28), gamma distribution was adopted for all input costs and beta distribution was used for probability and utility estimates (29).

Results

Base-case analysis

In the base case, atezolizumab showed an additional survival benefit of 1.27 life-years (LYs) compared to chemotherapy in high PD-L1 expression NSCLC patients. Accounting for quality of life, patients in the atezolizumab group survived 0.87 QALYs longer than the chemotherapy patients (1.75 *vs.* 0.88 QALYs). In the United States and China, the use of atezolizumab cost an additional $107,089 and $68,489, respectively, compared with chemotherapy, yielding an ICER of $123,424/QALY and $78,936/QALY, respectively (*Table 3*).

Sensitivity analysis

Figure 2 presents the results of one-way sensitivity analysis. *Figure 2A* shows that for the United States, the variables with the greatest influence on the ICER were the cost of atezolizumab and utility for PFS of atezolizumab and of chemotherapy. The ICER exceeded the WTP threshold

Table 1 Costs in the United States and China

Cost	US value	Range	Chinese value	Range	Distribution
Drug cost, US$/per cycle					
Atezolizumab	9,382	7,505 to 11,258	5,012	4,009 to 6,014	Gamma
Pemetrexed	6,587	5,270 to 7,904	728.9	583.1 to 874.7	Gamma
Carboplatin (nonsquamous NSCLC)	30.55	24.44 to 36.66	92.61	74.09 to 111.1	Gamma
Carboplatin (squamous NSCLC)	25.46	20.37 to 30.55	77.18	61.74 to 92.61	Gamma
Cisplatin	22.69	18.15 to 27.23	15.71	12.57 to 18.85	Gamma
Gemcitabine (with Cisplatin)	89.28	71.42 to 107.14	1124	899.6 to 1,349	Gamma
Gemcitabine (with Carboplatin)	71.42	57.14 to 85.71	899.6	719.7 to 1,079	Gamma
Nivolumab	5,994	4,795 to 7,192	2,756	2,205 to 3,307	Gamma
Pembrolizumab	7,091	5,673 to 8,509	3,559	2,847 to 4,271	Gamma
Paclitaxel	48.51	38.81 to 58.21	967.1	773.7 to 1,161	Gamma
Docetaxel	97.20	77.76 to 116.64	1,281	1,025 to 1,537	Gamma
Administration cost, US$					
First hr	142.55	122.39 to 189.18	0.92	0.73 to 1.10	Gamma
Additional hr	30.68	27.00 to 39.38	0.31	0.24 to 0.37	Gamma
AEs cost, US$					
Anemia	8,779 [19]	7023 to 10,535	483.7	387.0 to 580.4	Gamma
Thrombocytopenia	5,848 [19]	4,678 to 7,018	1,811	1,449 to 2,173	Gamma
Neutropenia	36,346 [20]	29,077 to 43,615	704.5	563.6 to 845.4	Gamma
Immunohistochemical test	108.38	96.12 to 139.05	152.8	122.24 to 183.36	
Follow-up cost, US$/per month	118.39	94.71 to 142.07	49.51	39.61 to 59.41	
Best supportive care, US$/per month	4,221 [21]	3,377 to 5,065	485.6 [23]	388.5 to 582.7	Gamma
Cost of terminal care, US$	17,185 [22]	13,748 to 20,622	2,205 [23]	1,764 to 2,646	Gamma

NSCLC, non-small cell lung cancer; AEs, adverse events.

of $150,000 per QALY when the price of atezolizumab ($7.82 per milligram) increased to the upper limit ($9.38 per milligram) or the utility for PFS of atezolizumab (0.691) increased to 0.829. The ICER was lower than the WTP threshold of $100,000 per QALY when the price of atezolizumab decreased to $6.25 per milligram. For China (*Figure 2B*), the cost of atezolizumab, utility for PFS of atezolizumab, and the time horizon had considerable impact on the ICER. Across the variation ranges for all parameters, the ICERs remained greater than $60,000 per QALY, which was higher than the Chinese WTP threshold.

For high PD-L1 expression patients in the United States, probabilistic sensitivity analysis indicated that when the

WTP was $100,000 to $150,000 per QALY, the probability of atezolizumab strategy being cost-effective compared with chemotherapy strategy was 13.1% and 85.8%, respectively (*Figure 3A*). For China (*Figure 3B*), atezolizumab was not a cost-effective option compared to chemotherapy at the WTP threshold of $33,210 per QALY. We found that when atezolizumab pricing decreased to 48% of its original cost, the ICER was below the WTP threshold.

Discussion

Almost one-quarter of all cancer deaths are due to lung cancer (18.4% of total cancer deaths), making a significant

Table 2 Key variables for model

Variable	Atezolizumab arm	Range	Chemotherapy arm	Range	Distribution
Incidence of AEs (7)					Beta
Anemia	0.017	0.014 to 0.020	0.183	0.146 to 0.220	Beta
Thrombocytopenia	0.003	0.002 to 0.004	0.072	0.058 to 0.086	Beta
Neutropenia	0.007	0.006 to 0.008	0.175	0.140 to 0.210	Beta
Utility (24)					
Utility for PFS	0.691	0.558 to 0.829	0.653	0.522 to 0.786	Beta
Utility for PD	0.473	0.378 to 0.568	0.473	0.378 to 0.568	Beta
AEs disutility					
Anemia (25)	−0.073	−0.058 to −0.088	−0.073	−0.058 to −0.088	Beta
Thrombocytopenia (26)	−0.650	−0.520 to −0.780	−0.650	−0.520 to −0.780	Beta
Neutropenia (27)	−0.460	−0.368 to −0.552	−0.460	−0.368 to −0.552	Beta

AEs, adverse events; PFS, progression-free survival; PD, progressive disease.

Table 3 Base-case analyses in high PD-L1 expression population

Results	United States			China		
	Atezolizumab	Chemotherapy	ICER	Atezolizumab	Chemotherapy	ICER
LYs	3.14	1.87	1.27	3.14	1.87	1.27
QALYs	1.75	0.88	0.87	1.75	0.88	0.87
Total cost, $	257,618	150,529	107,089	90,359	21,870	68,489
ICER, $/LY			84,678			54,156
ICER, $/QALY			123,424			78,936

PD-L1, programmed death ligand 1; ICER, incremental cost-effectiveness ratio; LY, life year; QALY, quality adjusted life year.
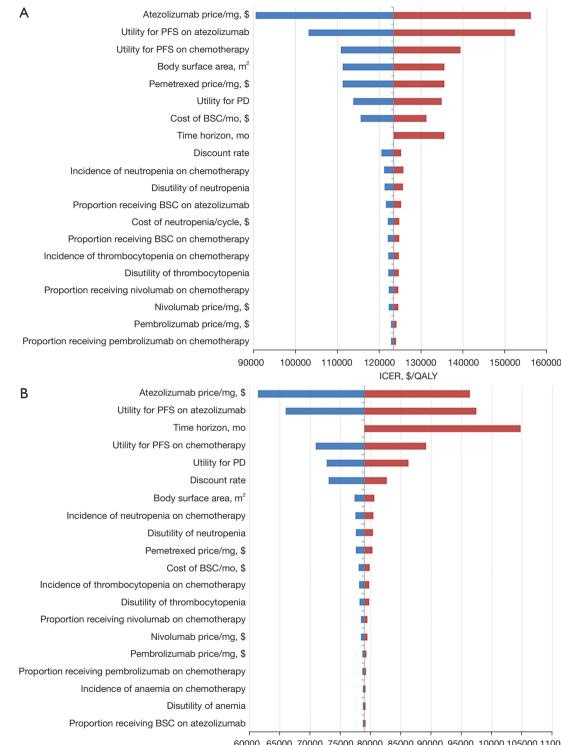
contribution to the rapidly growing global cost of cancer care (30). In recent years, ICIs have made a breakthrough in NSCLC treatment, but their high cost has placed great economic pressure on payers (31). Therefore, the association between clinical benefit and drug cost needs to be demonstrated to develop pricing strategies for immunotherapy drugs.

The phase 3 IMpower110 trial showed that atezolizumab had significant survival benefits compared with chemotherapy for metastatic NSCLC patients with high PD-L1 expression. Our study aimed to evaluate the health and economic outcomes of atezolizumab as first-line treatment of metastatic NSCLC patients, from a US and Chinese perspective.

In the United States, the base-case ICER for atezolizumab of $123,424/QALY fell within the acceptable WTP threshold range of $100,000/QALY–$150,000/QALY. Probabilistic sensitivity analysis showed that atezolizumab had a high probability (85.8%) of being determined cost-effective over chemotherapy at the upper limit of WTP threshold. Recently, a cost-effectiveness analysis of atezolizumab compared with chemotherapy from US perspective was conducted (32), demonstrating that atezolizumab cost an additional $224,590 ($311,054 *vs.* $86,464) and provided survival gain of 1.32 QALYs (2.36 *vs.* 1.08 QALYs) compared with chemotherapy, yielding an ICER of $170,730/QALY. These results have reached a conclusion that atezolizumab was estimated not to be cost-effective compared with chemotherapy for high PD-L1expression NSCLC population which is inconsistent with ours. The main reason probably lies in different models used in the two studies; partitioned survival analysis

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Figure 2 Tornado diagrams of univariable sensitivity analyses. Results of ICER of atezolizumab versus chemotherapy for different model parameters of the United States (A) and China (B). The vertical black line intersecting the blue and red bars represents the ICER of $123,424 and $78,936 per QALY from the base case results. mg, milligram; PFS, progression free survival; PD, progressive disease; mo, month; BSC, best supportive care; ICER, incremental cost-effectiveness ratio; QALY, quality adjusted life year.
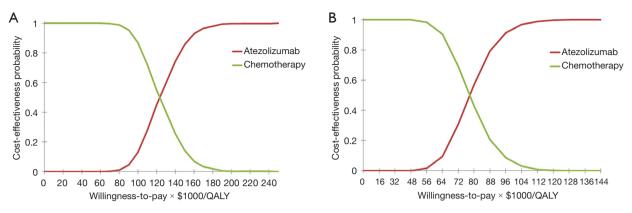
Figure 3 Cost-effectiveness acceptability curves. Results of probabilistic sensitivity analysis for atezolizumab versus chemotherapy for the United States (A) and China (B), which indicate the cost-effectiveness probability at different willingness-to-pay thresholds. QALY, quality adjusted life year.

model was designed in our study, while the published article developed a Markov model and calculated survival rate of atezolizumab by multiplying the survival rate of chemotherapy and the hazard ratios (HRs), resulting in longer QALY for atezolizumab group. Different variables and costs used for models may also explain the distinction between two ICERs. Before atezolizumab was approved by the FDA, pembrolizumab monotherapy was the standard-of-care for metastatic nonsquamous NSCLC patients with PD-L1 tumor proportion score (TPS) >50%, and many studies have verified its cost-effectiveness compared to platinum-based chemotherapy in the United States (18,23,33). Our results confirmed that after pembrolizumab, atezolizumab is the second immuno-monotherapy that has been proven to be cost-effective for people with high PD-L1 expression, providing more treatment options for this population.

Until now, there has been no relevant study from a Chinese perspective for the economic evaluation of this therapeutic regimen. Contrary to the results of the United States, atezolizumab was not shown to be cost-effective compared to chemotherapy in China, which had an ICER of $78,936 per QALY, more than twice the WTP of $33,210 per QALY. The results of one-way sensitivity analysis revealed the cost of atezolizumab was the most influential parameter, indicating that a price reduction may be a feasible strategy to increase the cost-effectiveness of atezolizumab treatment. We found that when atezolizumab pricing decreased to 48% of its original cost, the ICER fell below the WTP threshold of $33,210 per QALY, which resulted in atezolizumab becoming

cost-effective. This finding could help with negotiating adjustments to the cost of atezolizumab to achieve more favorable economic results. Since 2017, the Chinese National Healthcare Security Administration has conducted price negotiations for oncology drugs, with the cost of some ICIs falling significantly in order to be included on the National Reimbursement Drug List (NRDL). The Chinese government has stated that future negotiations regarding oncology drug costs will be conducted on the basis of pharmacoeconomic evaluation, and thus our results could provide evidence for any future negotiations that may occur for atezolizumab. Based on the differing results from US and Chinese perspectives, it is evident that even for the same treatment, cost-effectiveness analysis outcomes from high-income and middle-income countries might be distinct. Thus, different regions should take into account locally representative economic parameters before drug approval.

Prior to the approval of atezolizumab monotherapy for first-line treatment of NSCLC, atezolizumab in combination with chemotherapy was shown to reduce overall mortality risk compared with chemotherapy alone. Several studies evaluated the cost-effectiveness of atezolizumab combination therapy, but the results indicated that the cost was not commensurate with the survival improvements it could provide. An analysis conducted by Criss *et al.* revealed that compared to treatment with bevacizumab, carboplatin, and paclitaxel (BCP), the addition of atezolizumab to BCP (ABCP) was estimated to obtain an ICER of $201,676/QALY (34), while the results from another study indicated that the ICER of ABCP was

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$568,967/QALY and $516,114/QALY compared with BCP and carboplatin plus paclitaxel (CP), respectively (35). These results indicated that first-line treatment with ABCP was not a cost-effective treatment option for metastatic NSCLC in the United States. Cost-effectiveness analysis based on IMpower130 trial data have also shown that the addition of atezolizumab to carboplatin plus nab-paclitaxel is not an economically preferred treatment compared with chemotherapy for first-line treatment of NSCLC patients from a value standpoint in both the United States (36,37) and China (38). Although atezolizumab combination therapy has clinical benefit, it is unlikely to be cost-effective for NSCLC patients compared to chemotherapy. Our study confirmed that atezolizumab monotherapy had the advantage of having a relatively lower total cost, making it cost-effective for NSCLC patients with high PD-L1 expression in the United States. Reducing the price of atezolizumab in China would be the most effective way to make this treatment strategy economical. In addition to the clinical benefit achieved in the treatment of NSCLC, atezolizumab has made a major breakthrough in extensive-stage small-cell lung cancer (ES-SCLC). Atezolizumab or durvalumab combine with etoposide plus platinum chemotherapy (AEP and DEP respectively) significantly improve patients' survival and were approved by FDA as a first-line options for treating ES-SCLC. In a cost-effectiveness and network meta-analysis study, AEP represented a dominant treatment strategy compared with DEP. Despite neither AEP nor DEP was cost-effective compared with EP chemotherapy, AEP was able to provide a more efficient balance between incremental cost and QALY than DEP (39). These achievements in advanced-stage lung cancer inspired investigators to conduct further clinical trials in patients with early-stage lung cancer in both adjuvant and neoadjuvant therapies (40,41), which call for corresponding cost-effectiveness research to elucidate the economic benefits of these therapies.

There were several limitations to our analysis. First, as we collected clinical information from the IMpower110 trial retrospectively, any biases within the trial could impact the outcomes of our model. Second, the median follow-up for high PD-L1 expression population in the IMpower110 clinical trial was 15.7 months, and because the model needed a time horizon long enough to simulate survival benefit and cost burden, we extrapolated the long-term PFS and OS curves using the short-term data of the clinical trial. When long-term survival data are available, we will perform a trial-based analysis to confirm or update current

results. Third, we assumed that Chinese patients had the same utility values as US patients. Although this may lead to bias for the Chinese context, utility value variations were tested through sensitivity analysis, which showed that ICERs were always higher than the WTP within the settled range. Fourth, the cost of AEs of grade 1/2 or with a frequency lower than 5% in both treatment groups were excluded in this study. Some AEs, such as immune-related AEs, rarely occur but are costly to manage, which may lead to and underestimation of AE costs. Fifth, most base-case costs in China were derived from Xiangya Hospital, Central South University. Although these costs represent the price of medical care in most Chinese medical facilities, there may still be small differences across hospitals or regions, which could affect the generalizability of our findings.

Conclusions

In summary, for the United States, with a WTP threshold of $100,000 to $150,000 per QALY, atezolizumab was cost-effective for first-line treatment when compared with platinum-based chemotherapy in metastatic NSCLC patients with high PD-L1 expression. For China, atezolizumab was unlikely to be considered high-value treatment for NSCLC at a WTP threshold of $33,210 per QALY, and a price reduction of 52% appeared to be justified.

Acknowledgments

Footnote

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Table S1 Treatment regimens in IMpower110

Regimen	Histologic type at diagnosis	Therapy	Dose	Frequency	Duration	Maintenance	Distribution
Atezolizumab alone	–	Atezolizumab	1,200 mg	Day 1 of every 3-week cycle	Maximum 35 cycles		
Platinum-based chemotherapy	Nonsquamous	Pemetrexed + Cisplatin	500 mg/m^2 + 75 mg/m^2	Day 1 of every 3-week cycle	4 or 6 cycles	Pemetrexed	69.7%
		Pemetrexed + Carboplatin	500 mg/m^2 + AUC 6	Day 1 of every 3-week cycle	4 or 6 cycles		
	Squamous	Gemcitabine + Cisplatin	1,250 mg/m^2 + 75 mg/m^2	Gemcitabine Day 1, 8 and Cisplatin Day 1 of every 3-week cycle	4 or 6 cycles	Best supportive care	30.3%
		Gemcitabine + Carboplatin	1,000 mg/m^2 + AUC 5	Gemcitabine Day 1, 8 and Carboplatin Day 1 of every 3-week cycle	4 or 6 cycles		

\AUC, area under the curve; IV, intravenous infusion.

Table S2 Summary of subsequent therapy

Type of therapy	Atezolizumab alone		Platinum-based chemotherapy	
	Therapy*	Proportion	Therapy*	Proportion
Anticancer therapy[#]	–	29.6%	–	49.5%
Chemotherapy	Carboplatin	17%	Carboplatin	5.8%
	Gemcitabine	7.9%	Docetaxel	12.3%
	Pemetrexed	10.1%		
	Cisplatin	7.6%		
	Paclitaxel	5.8%		
Immunotherapy			Nivolumab	15.9%
			Pembrolizumab	11.2%
Best supportive care	–	70.4%	–	50.5%

[#], participants may have received more than 1 subsequent anticancer therapy and only the treatments with frequency greater than 5% were considered; *, the details of subsequent therapy were assumed based on data from IMpower110.
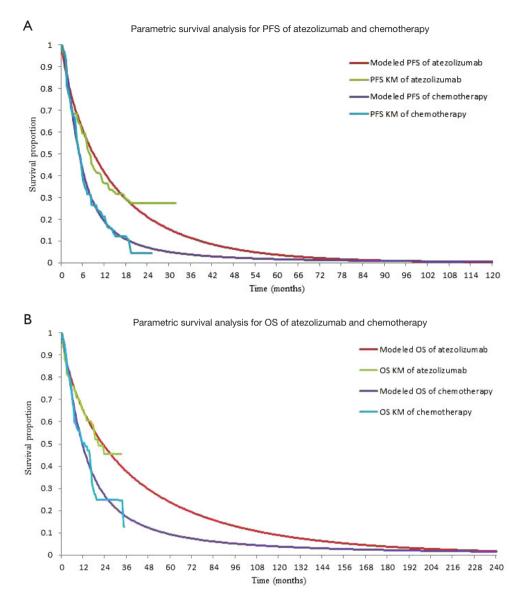
Figure S1 Parametric survival analysis. OS, overall survival; PFS, progression-free survival; KM, Kaplan-Meier.

Table S3 Grade 3–5 adverse events with a frequency greater than 5% in IMpower110

Adverse event	Atezolizumab alone, n (%)	Platinum-based chemotherapy, n (%)
Anemia	5 (1.7)	48 (18.3)
Thrombocytopenia	1 (0.3)	19 (7.2)
Neutropenia	2 (0.7)	46 (17.5)