

Economic evaluation of anaplastic lymphoma kinase (ALK) inhibitors compared with standard chemotherapy in Thailand

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BACKGROUND

- Anaplastic lymphoma kinase (ALK) inhibitors, including Alectinib, Brigatinib, and Ceritinib, are recommended by the National Comprehensive Cancer Network (NCCN) for treating patients with ALK-arranged non-small-cell lung cancer (NSCLC) in an advanced stage.
- The situation of access to drugs for patients with ALK-arranged NSCLC is still limited to only platinum-based chemotherapy with Paclitaxel or Gemcitabine.
- The newer generation of treatments, including Pemetrexed and ALK inhibitors, are currently not covered by health insurance schemes in Thailand.
- The economic value of newer generations of treatments would help decision-makers to revise benefit schemes for patients.

METHODS

- A Markov model was developed to perform the economic and health outcomes for treating advanced NSCLC patients from a societal perspective as presented in **Figure 1**.
- In **Figure 2**, ALK inhibitors were utilized as an intervention, while platinum-based chemotherapy was considered as a comparator.
- The time horizon for this study was the lifetime of the patients.
- The outcome was measured in units of quality-adjusted life-year (QALY) while cost parameters were derived from a literature review and the standard cost list of the Thai Health Technology Assessment (HTA).
- The incremental cost-effectiveness ratio (ICER) was applied to demonstrate the cost-effectiveness of alternative regimens.
- One-way and probabilistic sensitivity analyses were conducted to examine the model's robustness.

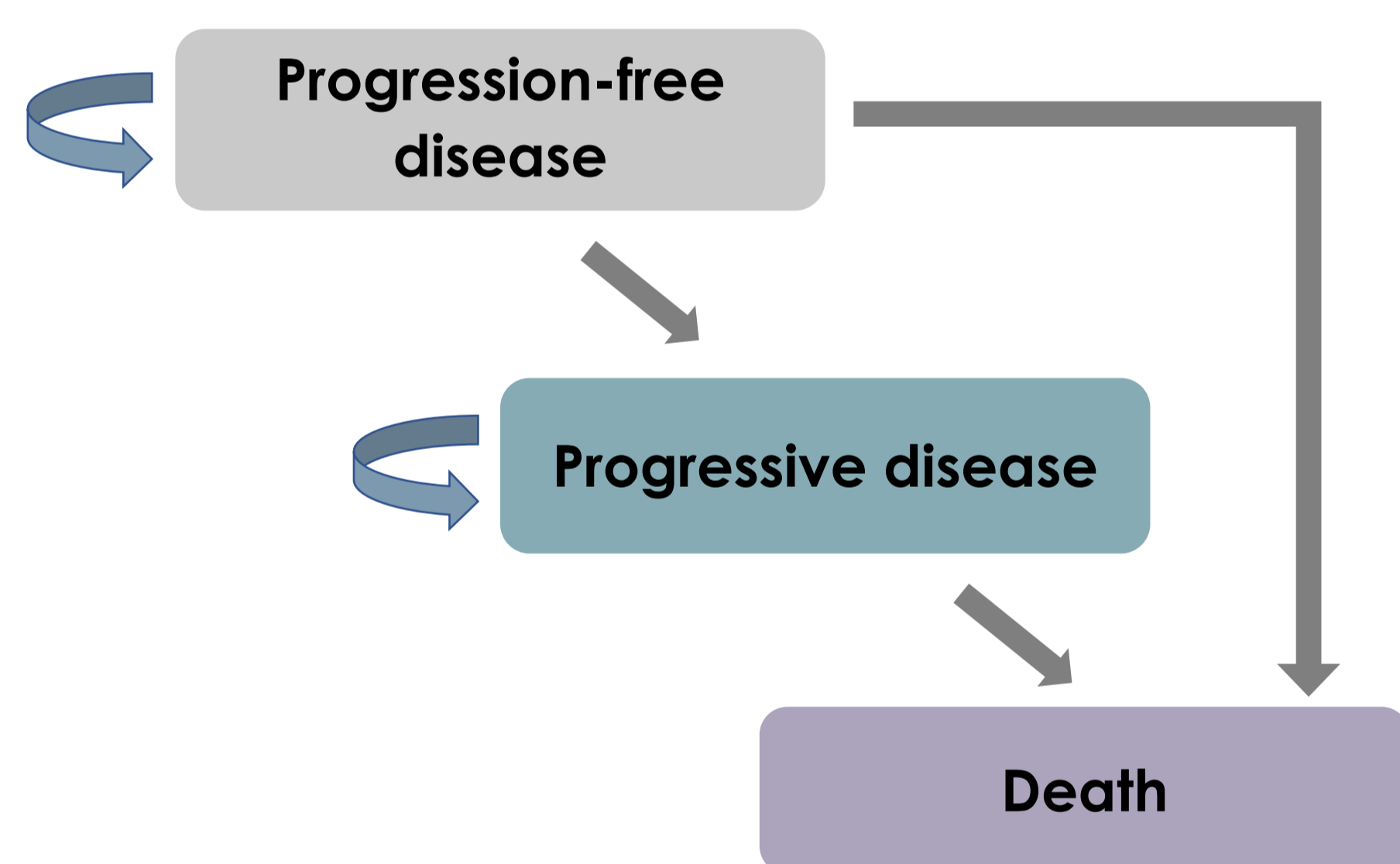
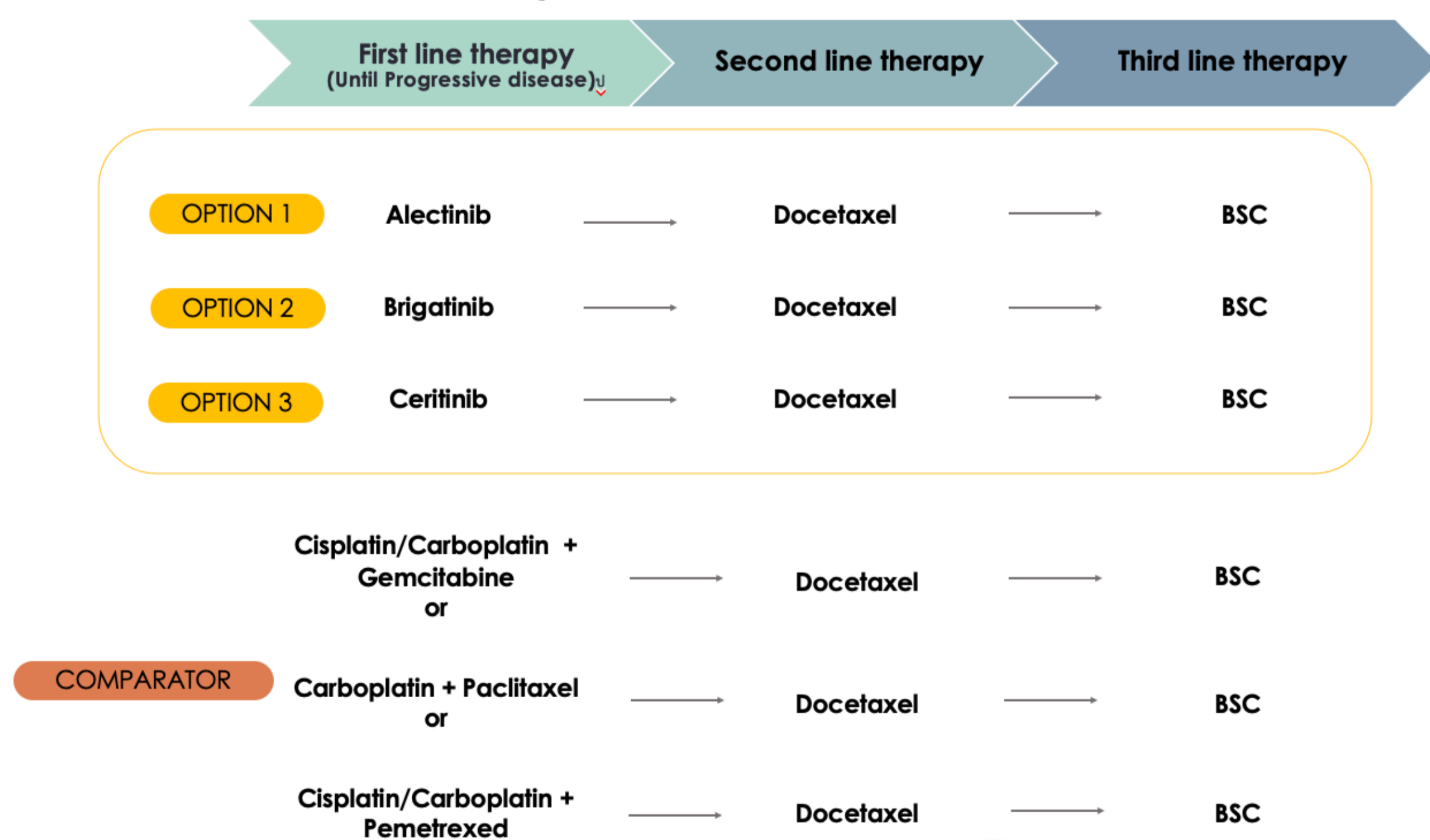


Figure 1 Markov model



Abbreviation: BSC: Best Supportive Care

Figure 2 Interventions and Comparators

OBJECTIVE

- This study aimed to evaluate the cost-utility analysis of Alectinib, Brigatinib, and Ceritinib compared to standard chemotherapy in advanced NSCLC patients.

RESULTS

- **Table 1** displays a scenario analysis comparing the newer generations of treatments with standard chemotherapy.
- Carboplatin/Paclitaxel had the lowest cost and the fewest QALYs, whereas Alectinib (1,200 mg/day) incurred the highest cost and yielded the greatest QALYs.
- All ALK inhibitors and Pemetrexed regimens were not cost-effective at the willingness to pay in Thailand (160,000 THB/QALY).
- The full dose of all ALK inhibitors and Carboplatin regimens was dominated by half the recommended dose and Cisplatin regimens, respectively.

Table 1 Scenario analysis

Alternatives	Lifetime costs (THB)	QALYs	ICER
Carboplatin/Paclitaxel	81,085.38	0.42	-
Cisplatin/Gemcitabine	88,453.97	0.60	40,937
Carboplatin/Gemcitabine	93,842.62	0.60	Dominated
Cisplatin/Pemetrexed	259,632.33	0.90	570,595
Carboplatin/Pemetrexed	263,110.03	0.90	Dominated
Ceritinib (450 mg/day)	632,075.06	1.19	1,284,285
Ceritinib (750 mg/day)	994,519.30	1.19	Dominated
Brigatinib (180 mg/day)	2,707,745.65	1.50	6,695,712
Alectinib (600 mg/day)	3,063,227.91	1.88	935,480
Alectinib (1,200 mg/day)	6,017,887.12	1.88	Dominated

Sensitivity analysis

- One-way sensitivity analysis results showed that the parameters with the greatest impact on ICER fluctuation were the utility of progression-free disease for ALK inhibitors, cost of ALK inhibitors, and utility of progression-free disease for comparators.
- Probabilistic analysis results found that all ALK inhibitors were not cost-effective at the willingness to pay 160,000 THB/QALY (**Figure 3**).

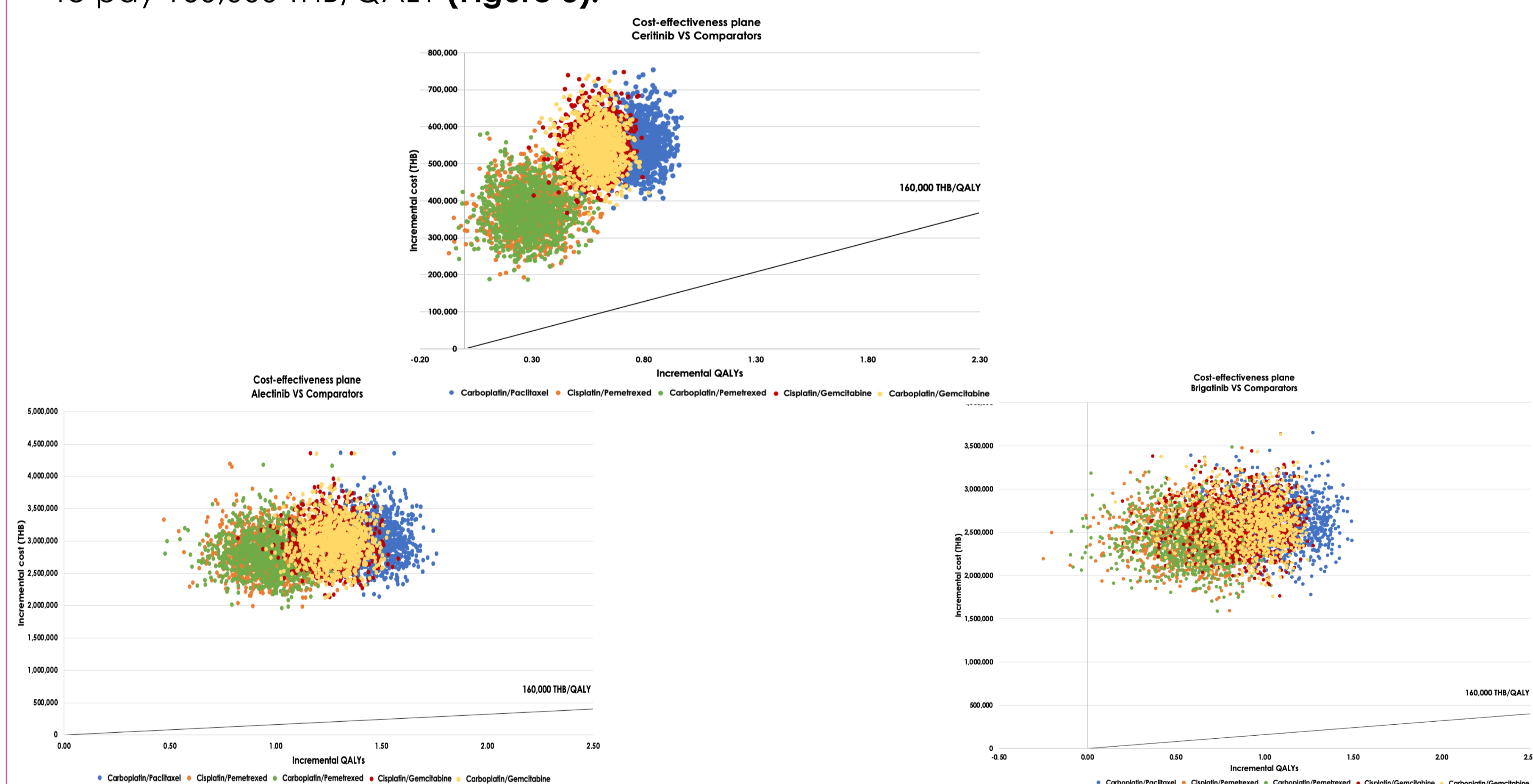


Figure 3 Probabilistic sensitivity analysis of all ALK inhibitors

DISCUSSION

- All ALK inhibitors and Pemetrexed regimens were not cost-effective at the willingness to pay in Thailand.
- However, these drugs are an unmet medical need for patients who require ALK inhibitors to potentially increase their survival time and improve their quality of life.
- Therefore, the use of ALK inhibitors and alternative treatments such as pemetrexed-based chemotherapy, remain of great interest.
- The NCCN guidelines recommend the full dose of ALK inhibitors, while real-world practice among ASEAN populations often involves using half the recommended dose. This strategy can enhance the potential for cost-effectiveness within the context of Thailand's willingness to pay.

CONCLUSION

- The newer generation of treatments, including Pemetrexed and ALK inhibitors were not cost-effective within the context of Thailand's willingness to pay. However, these results could be used as evidence to support policymakers in reimbursement decisions and finding alternative funding solutions.

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