Cost-effectiveness of ESMO-Recommended Lenvatinib and Pembrolizumab Regimen as Second-Line Treatment for Advanced Endometrial Carcinoma in Taiwan:

A Comparison with NCCN Recommendations

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Background

- The European Society for Medical Oncology (ESMO) and the National Comprehensive Cancer Network (NCCN) provided different recommendations for the second-line treatment of advanced endometrial carcinoma (EC).
- ESMO recommends the combination of lenvatinib and pembrolizumab (LP) for all patients, while the NCCN suggests LP for patients with proficient mismatch repair (pMMR) and pembrolizumab for those with deficient mismatch repair (dMMR).
- However, there is currently no cost-effectiveness analysis (CEA) evidence for the treatment strategies recommended by these two treatment guidelines, which the National Health Insurance Administration (NHIA) to refer.

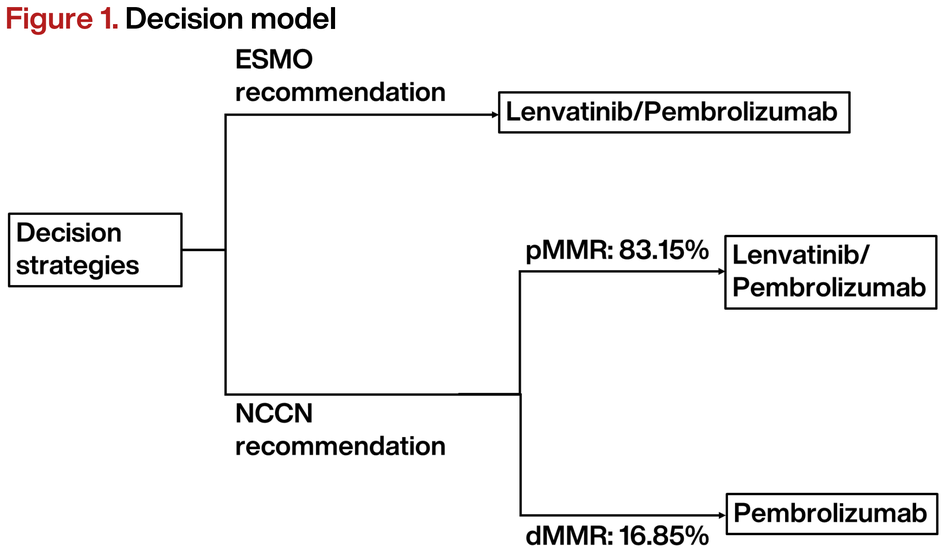
Objective

- **This study evaluated the cost-effectiveness of the universal LP regimen recommended by ESMO as a second-line treatment for advanced EC, compared to the biomarker-based treatment regimen recommended by the NCCN, from the perspective of Taiwan's NHIA.**

Methods

- In the intervention arm, patients received LP regardless of their MMR status. In the comparator arm, patients with pMMR received LP, while others received pembrolizumab.

Figure 1. Decision model



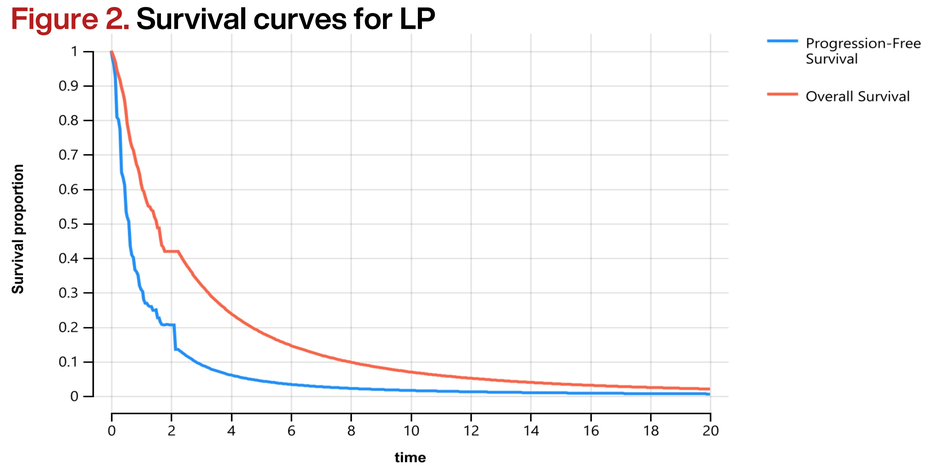
- The analytical framework and parameters of this decision model are listed below:

Table 1. Analytical framework and model inputs

Population	Advanced EC patients who failed their first-line therapy
Intervention	LP for all patients
Comparator	LP for patients with pMMR and pembrolizumab for those with dMMR
Cost	Genetic testing fee, direct medication cost (LP: NT$152,194/3-week, pembrolizumab: NT$111,538/3-week), and nonmedication cost
Outcome	quality-adjusted life-years (QALYs)
CEA outcome	Incremental cost-effectiveness ratio (ICER) and incremental net monetary benefit (INMB)
Study design	3-state partitioned survival model (progression-free, progressed disease, and death)
Perspective	NHIA, Taiwan
Time horizon	20 years
Discount rate	3% per year to costs and outcomes
Willingness-to-pay	3 times the GDP per capita in 2022 (NT$2,925,582)
Sensitivity analysis	■ Deterministic sensitivity analysis (DSA) ■ Probabilistic sensitivity analysis (PSA) ■ Value of information analysis (VOI)
Parameter source	■ The efficacy data were derived from the KEYNOTE-775, KEYNOTE-158, and KEYNOTE-146 trials. ■ The cost data were derived from market price and the NHI claims database. ■ The utility data were derived from previous literature.

- We employed a hybrid method (KM curve + parametric model) to estimate effectiveness.

Figure 2. Survival curves for LP



Results

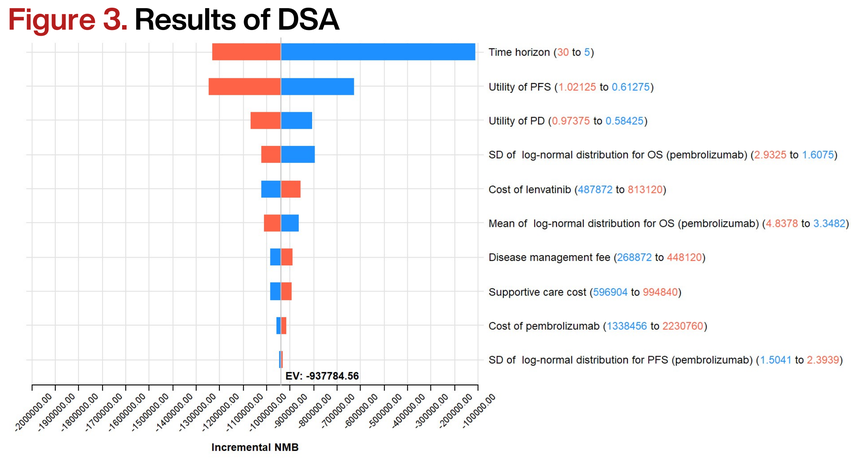
- The ESMO-recommended treatment resulted in an incremental -0.6 QALYs, with incremental costs of -NT$821,027, yielding an ICER of NT$1,365,685 per QALY and an INMB of -NT$937,785, which was not cost-effective.

Table 1. Base-case results

Regimen	Costs	QALY gained	CEA outcome
ESMO: LP for all patients	NT$3,998,898	2.21	
NCCN: LP or pembrolizumab based on MMR status	NT$4,819,925	2.82	
Difference	**-NT$821,027**	**-0.6**	
ICER			**NT$1,365,685**
INMB			**-NT$937,785**

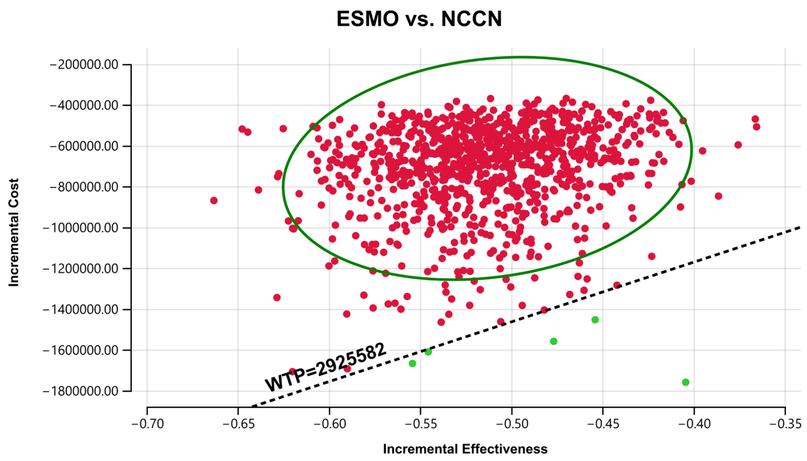
- The time horizon, utilities, medication cost of LP, and parameters of survival functions for pembrolizumab were the most influential factors.

Figure 3. Results of DSA



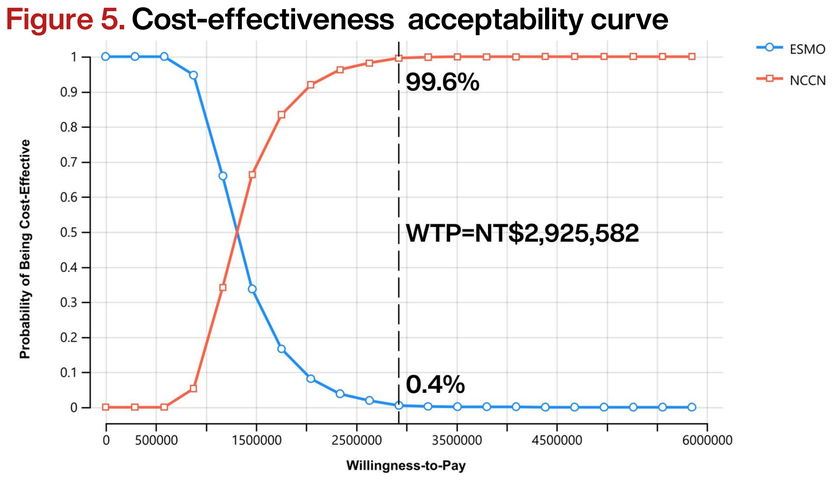
- The ESMO-recommended treatment yielded lesser effectiveness at lower costs.

Figure 4. Scatterplot on the cost-effectiveness plane



- The ESMO-recommended treatment was 0.4% cost-effective in PSA.

Figure 5. Cost-effectiveness acceptability curve



Conclusions

- **From the perspective of Taiwan's NHIA, the NCCN's biomarker-based regimen emerges as a more cost-effective treatment option for patients with advanced EC compared to ESMO's recommendation.**

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