[Abstract #144121]

COST-EFFECTIVENESS OF NIVOLUMAB IN COMBINATION WITH PLATINUM DOUBLET CHEMOTHERAPY (PDC) FOR THE NEOADJUVANT TREATMENT OF RESECTABLE NON-SMALL CELL LUNG CANCER IN SLOVENIA

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Introduction

- Lung cancer is the third most common cancer diagnosis worldwide and is the leading cause of cancer-related mortality, with poor 5-year survival outcomes.[1]
- Standard of care in the Slovenia for resectable NSCLC is surgery coupled with either neoadjuvant or adjuvant platinum-doublet chemotherapy (PDC)[2] prior to the approval of immunotherapies.
- Nivolumab is a PD-1 inhibitor that demonstrated favorable outcomes in terms of event-free survival and pathological complete response in the CheckMate-816 (CM-816) trial,[3] a phase 3, randomized controlled study, that compared neoadjuvant nivolumab + PDC vs. neoadjuvant PDC alone, among patients with stage IB to IIIA NSCLC (per seventh edition tumor-node-metastasis American Joint Committee on Cancer criteria[4]).
- In June 2023, based on the outcomes of CM-816, the EMA approved nivolumab for the neoadjuvant treatment of resectable non-small cell lung cancer at high risk of recurrence in adult patients whose tumors have PD-L1 expression ≥ 1%, in combination with platinum-based chemotherapy[5].
- The aim of our study was to determine the cost-effectiveness and cost-utility of Opdivo (nivolumab) in combination with platinum-based chemotherapy in the neoadjuvant treatment of operable non-small-cell lung cancer at high risk of recurrence in adult patients with tumors expressing PD-L1 ≥ 1%, compared with the therapies currently used to treat these patients in Slovenia.
- To meet this objective, a global health economic model was adapted to Slovenian setting, from the perspective of a Slovenian third-party payer (The Health Insurance Institute of Slovenia i.e. Zavod za zdravstveno zavarovanje Slovenije).

Methods

Model overview

- A three-state Markov model was used with following modelled health states: event free, progressive disease, and death. The modelled population and key clinical inputs were based on the second interim analysis of the CheckMate-816 trial PD-L1 expression ≥ 1% subgroup.
- Comparators considered were neoadjuvant PDC, neoadjuvant chemoradiation, surgery alone, and adjuvant PDC. The model considered costs of treatment acquisition and administration, surgery, treatment adverse events, medical resource use and terminal care.
- The analysis was performed from the perspective of the payer The Health Insurance Institute of Slovenia, the analysis period is lifetime, the discount rate for costs and benefits is 3.5%.

Table 1 Model summary

Key Model Settings	
Population	Adult patients with stage IB to IIIA*, resectable NSCLC
Intervention	Neoadjuvant nivolumab + PDC
Comparators	Neoadjuvant PDC, neoadjuvant CRT, adjuvant PDC, and surgery only
Time horizon	Lifetime (35 years)
Cycle length	3 weeks
Perspective	the Health Insurance Institute of Slovenia
Discount Rate	3.50%

Figure 1 Model structure diagram

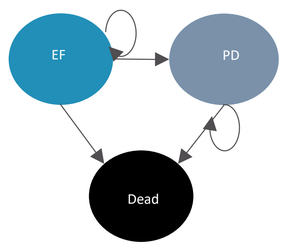
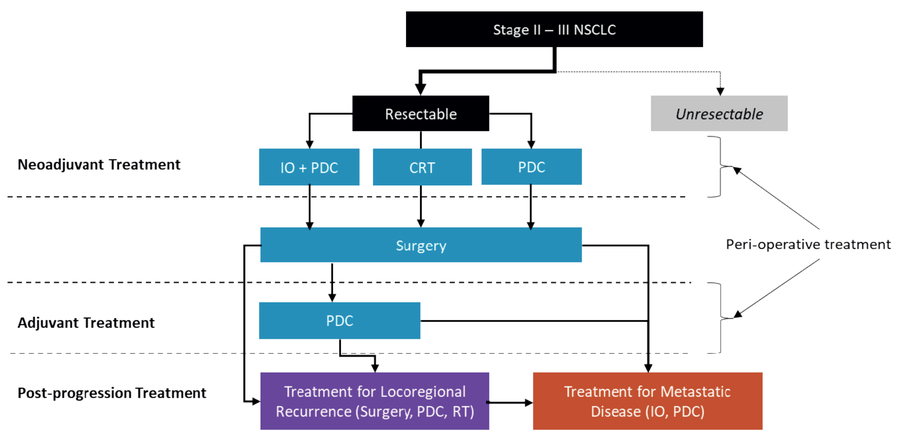


Figure 2 Treatment pathway



- The model considered costs of treatment acquisition and administration, surgery, treatment adverse events, medical resource use and terminal care.

Table 2 Treatment cost key inputs

EVENT-FREE STATE

NEOADJUVANT THERAPY				
Treatment	Drug Acquisition Cost per Model Cycle	Drug Administration Cost Initial Model Cycle	Drug Administration Cost Subsequent Model Cycle	Radiotherapy Costs per Model Cycle
Nivolumab + PDC	€4,570.82	€333.25	€217.19	€0.00
PDC (neoadjuvant)	€950.81	€330.08	€214.02	€0.00

Surgery (Initial Resection)	
Treatment	Cost of Surgery
Nivolumab + PDC	€3,935.07
PDC (neoadjuvant)	€3,847.88
PDC (adjuvant)	€4,883.84
Surgery only	€4,858.33

ADJUVANT THERAPY

Patients on neoadjuvant treatments who continue with adjuvant treatments

Treatment	Cost of Adjuvant Systemic Therapy	Cost of Adjuvant Radiotherapy	Total Cost of Adjuvant Therapy
Nivolumab + PDC PDC	€178.24	€2,432.78	€2,611.01
PDC (neoadjuvant)	€394.84	€6,645.13	€7,039.97

Patients receiving adjuvant therapy alone

Treatment	Drug Acquisition Cost per Model Cycle	Drug Administration Cost Initial Model Cycle	Drug Administration Cost Subsequent Model Cycle	Radiotherapy Costs per Model Cycle
PDC (adjuvant)	€1,829.54	€338.00	€221.94	€0.00

Post-Progression State

Post-progression Treatment

Treatment	Overall Post-Progression Treatment Costs
Nivolumab + PDC	€20,725.48
PDC (neoadjuvant	€21,852.47
PDC (adjuvant)	€21,852.47
Surgery only	€21,852.47

Results

- The cost-effectiveness of nivolumab in combination with platinum doublet chemotherapy (PDC) for the neoadjuvant treatment of resectable non-small cell lung cancer in Slovenia is presented as the ratio between incremental costs and outcomes of treatment, which is calculated in terms of qualityadjusted-life-years gained (Table 5).
- The neoadjuvant treatment with nivolumab in combination with PDC is more effective, but also more expensive than neoadjuvant PDC, surgery alone or adjuvant PDC, with incremental cost effectiveness ratios (ICERs) of 5.568 EUR/QALY, 8.067 EUR/QALY and 7.534 EUR/QALY, respectively.

Table 3 Cost Outcomes

	Nivolumab + PDC	PDC (neoadjuvant)	PDC (adjuvant)	Surgery only
Drug acquisition	€13,614.05	€2,800.24	€5,269.09	€0.00
Drug administration	€762.94	€746.36	€753.26	€0.00
Surgery	€3,935.07	€3,847.88	€4,883.84	€4,858.33
Adjuvant care after neoadjuvant treatement	€2,611.01	€7,039.97	€0.00	€0.0
Treatment cost in PD	€8,180.91	€12,265.49	€12,634.50	€14,807.60
Resource use	€51,039.31	€45,666.44	€45,127.41	€41,918.32
Treatment monitoring	€1,052.84	€1,448.10	€1,485.66	€1,612.11
AE management	€42.58	€50.84	€153.20	€0.00
Terminal cost	€1,556.98	€1,678.58	€1,690.80	€1,763.41
Total costs	€82,795.71	€75,543.88	€71,997.76	€64,959.77

Table 4 Health Outcomes

	Nivolumab + PDC	PDC (neoadjuvant)	PDC (adjuvant)	Surgery only
Total Life-years	9.53	8.01	7.86	6.95
Total QALYs	7.85	6.54	6.41	5.63

[a]Footnote line.

Table 5 The results of the cost effectivenes

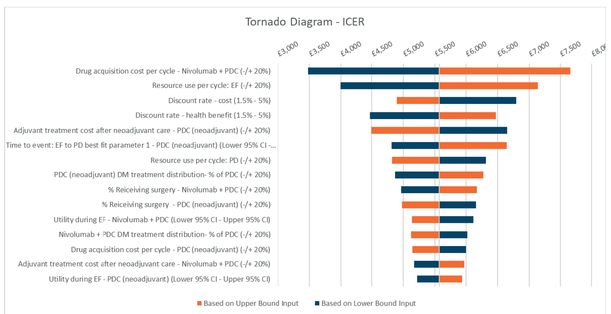
	PDC (neoadjuvant)	PDC (adjuvant)	Surgery only
Incremental Costs	€7,251.83	€10,797.95	€17,835.94
Incremental LYs	1.52	1.68	2.58
Incremental QALYs	1.30	1.43	2.21
ICER - Cost per LY	€4,763.41	€6,444.49	€6,900.76
ICUR - Cost per QALY	€5,568.74	€7,534.40	€8,067.52

[a]Footnote line.

Deterministic Sensitivity Analysis

- A deterministic sensitivity analysis (DSA) was used to understand the sensitivity of the model ICER to changes in input parameters • Based on DSA, the model ICER for all comparisons is highly sensitive to the acquisition cost of neoadjuvant nivolumab + PDC

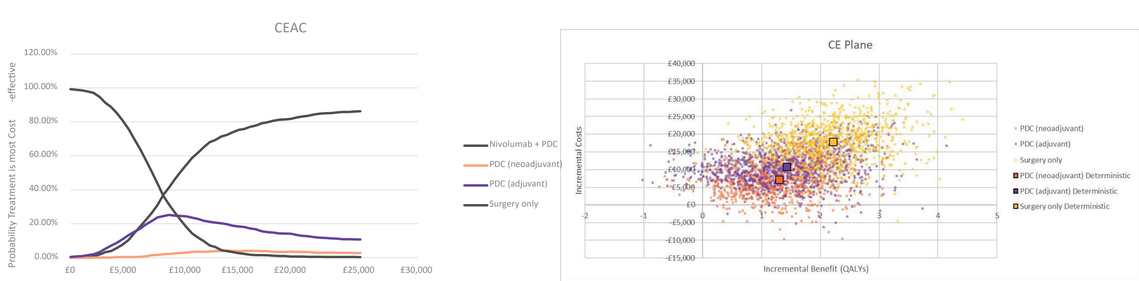
Figure 3 DSA



Probabilistic Sensitivity Analysis

- At a willingness-to-pay threshold (WTP) of €25000 per QALY, neoadjuvant nivolumab + PDC is cost-effective in Slovenia.

Figure 4 PSA output: CEAC and CE plane



Conclusion

The new neoadjuvant therapy with nivolumab for the treatment of patients with nmNSCLC is cost effective according to the Slovenian cost-effectiveness threshold set at 25.000 EUR/QALYG and represents a new standard of care for patients with resectable nmNSCLC.

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Disclosures

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Presented at ISPOR Europe 2024; November 17-20, 2024; Barcelona, Spain

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