

## BACKGROUND

The MammaPrint 70-gene signature helps to identify breast cancer patients who are at high risk of distant metastasis and might benefit from chemotherapy, as opposed to those with low-risk tumors who can safely forego chemotherapy.<sup>1,2</sup> MammaPrint enables physicians to make informed decisions for chemotherapy and as a result will minimize unnecessary exposure to chemotherapy's toxic effects and decrease financial burden for the healthcare system by avoiding overtreatment with associated direct and indirect medical and non-medical costs. A reduction of chemotherapy-related direct and indirect costs can have a significant impact on reducing the overall costs of breast cancer treatment.

This analysis evaluates the economic impact of implementing MammaPrint, the 21-gene signature (Oncotype DX [ODx]), or no gene signature testing for patients with hormone receptor-positive (HR+) HER2-negative early breast cancer with 1 to 3 positive lymph nodes (N1) in Germany.

## METHODS

We developed a cost-consequence model to evaluate the budgetary implications of using MammaPrint, ODx, or forgoing gene signature testing altogether. This model considers both perspectives: healthcare payers and society. The model focuses on patients with HR+/HER2-/N1 breast tumors. Input data were sourced from MINDACT, RxPONDER, literature, and German pricing repositories (EBM and DRG system). Key input parameters for the primary analysis are displayed in Table 1 and Table 2.

## METHODS

**Table 1: Input parameters for no test, MammaPrint and Oncotype DX**

Scenario	Cost [€]	Patients in each risk category [%]	Assignment to Treatment	Recurrence Probability
No Test	0.00	Node positive disease <sup>3</sup>	37 No Chemo	0.0850 <sup>2,4</sup>
			63 Chemo	0.0572 <sup>2</sup>
Oncotype DX <sup>5</sup>	2,881.80 <sup>7</sup>	RS = 0 - 25	83 No Chemo	0.0610 <sup>5</sup>
		RS = 26-100	17 Chemo	0.1690 <sup>6</sup>
MammaPrint <sup>2</sup>	2,302.77 <sup>7</sup>	Low Risk	73 No Chemo	0.0402 <sup>2</sup>
		High Risk	27 Chemo	0.1030 <sup>2</sup>

**Table 2: Chemotherapy and recurrence associated costs<sup>8,9</sup>**

Costs	Type of Costs	Price [€]
Chemotherapy application	Direct	5,292.22
Supportive medication	Direct	4,932.20
Supportive medication	Indirect	655.64
Control and planning	Direct	988.83
Short term adverse events	Direct	660.59
Long term adverse events	Direct	515.84
Loss in GDP	Indirect	16,752.41
Sick Pay	Indirect	2,729.83
Transport costs	Indirect	1,895.94
Costs of distant recurrence		152,925.70
Costs of local recurrence		32,859.00
Percentage of DR having experienced a LR		10%

**Table 1:** The model considers genomic risk proportions and efficacy parameters based on MINDACT and RxPONDER.

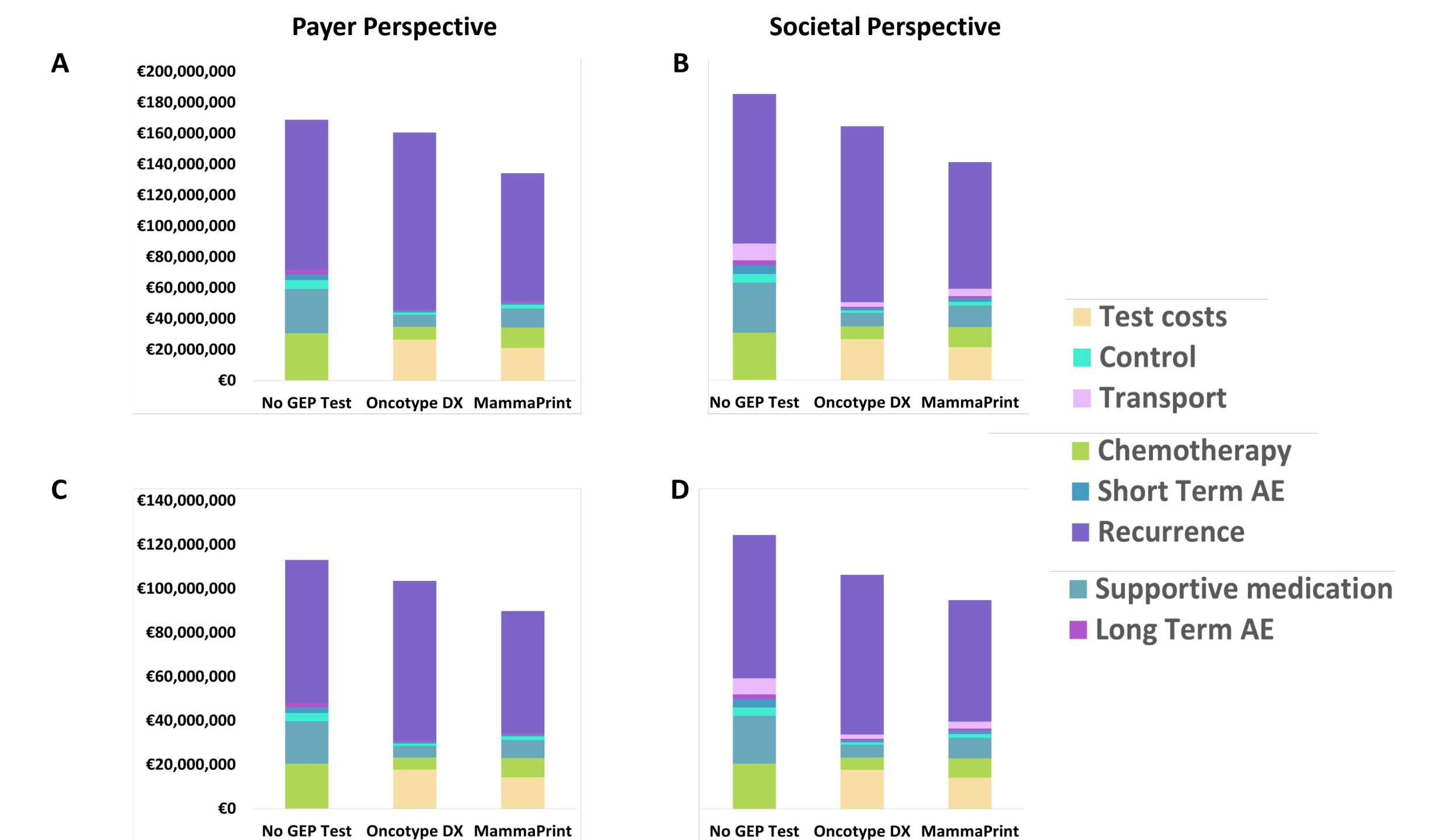
**Table 2:** The model considers chemotherapy related costs based on EBM prices and the DRG system. The healthcare payer perspective covers testing, direct/indirect costs of chemotherapy, and disease recurrence costs. The societal perspective adds transport costs and productivity losses.

## RESULTS

**Figure 1A & 1B:** The model demonstrated per patient savings from a healthcare payer perspective of €3,766 for MammaPrint and €900 for ODx compared to not using any gene signature for N1 breast cancer patients in Germany. Importantly, the savings are even more substantial from a societal perspective, reaching €11,815 for MammaPrint and €11,243 for ODx.

**Figure 1C and 1D:** When limiting the population to women >50 years due to available evidence, similar results were observed with per patient savings from a payer perspective of €3,766 and €1,549, and from a societal perspective of €9,826 and €9,349, for MammaPrint and ODx, respectively.

**Figure 1: Total costs for no test, MammaPrint and Oncotype DX. A: Payer Perspective; B: Societal Perspective; C: Payer Perspective, >50 years old; D: Societal Perspective, >50 years old**



## CONCLUSIONS

- In HR+/HER2-/N1 breast cancer, the use of MammaPrint leads to a reduction in chemotherapy use and associated costs in Germany compared to the absence of gene expression profiling testing.
- Although MammaPrint designates a slightly smaller proportion of genomically Low Risk patients compared to ODx, MammaPrint Low Risk patients without chemotherapy demonstrate higher survival outcomes, resulting in MammaPrint being a cost-conscious option.
- MammaPrint contributes to a personalized treatment plan, achieving a net reduction in the use of chemotherapy, providing savings for the German healthcare budget.



**€3,766 – 11,815**

Per patient savings

MammaPrint versus no GEP test in HR+/HER2-/N1 breast cancer



**€34,676,701**

Total savings payer perspective

MammaPrint versus no GEP test, largely driven by fewer chemotherapy related costs



**€ 108,786,145**

Total savings societal perspective

MammaPrint versus no GEP test, largely driven by fewer productivity losses