

Cost-Analysis of the Introduction of a Second Generation Biomarker Breast Cancer Prognostic Test for the Management of Early Breast Cancer in Greece

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Introduction and Objectives

The objective of this study was to estimate the economic costs from the introduction of a second generation gene expression test combining a molecular signature with the clinical factors tumor size and nodal status to a score predicting risk of distant recurrence and chemotherapy benefit (12-gene assay) for patients with estrogen receptor positive (ER+), human epidermal growth factor receptor 2 negative (HER2-) early-stage breast cancer who are lymph node negative or positive for the largest public payer in Greece.

Methods

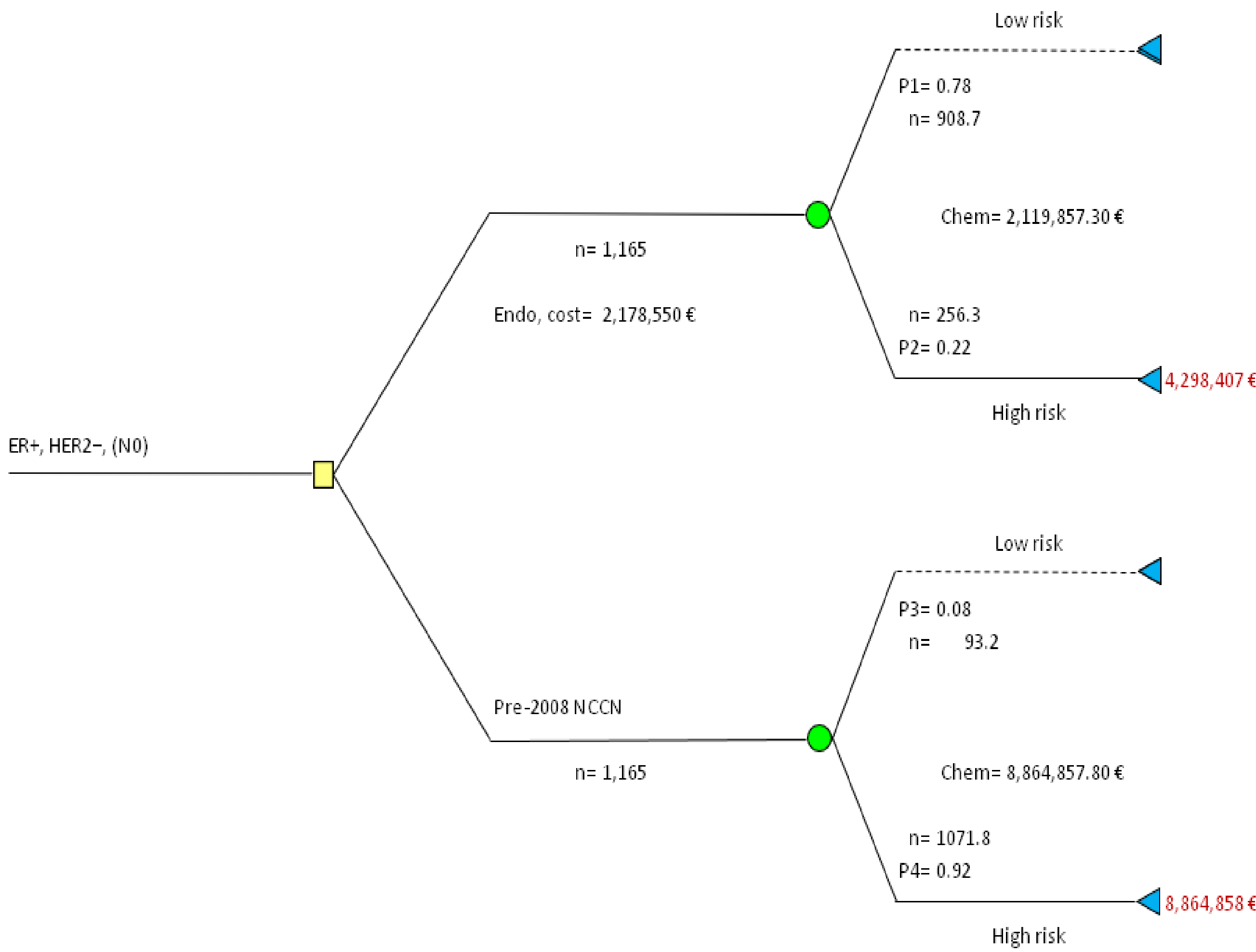
A cost analysis of introduction of the 12-gene assay was performed compared to the current clinical practice in Greece for different patient subgroups, including N0 patients and N+ (1–3) patients. Data on the number of patients and clinical efficacy of the biomarker breast cancer test were derived from large randomized, phase III clinical trials while cost data were obtained from Greek sources. The primary outcome was the economic direct costs to the third payer for the 1st year of diagnosis.

Results

For a hypothetical cohort of 1,165 ER+, HER2-, N0 patients, the total costs of new practice after testing amounts to €4.3 million compared to an estimated total cost of €8.86 million of currently clinical practice, contributing cost-savings of approximately €4.5 million (graph 1) and resulting to approximately €4,000 cost-savings per patient (graph 3).

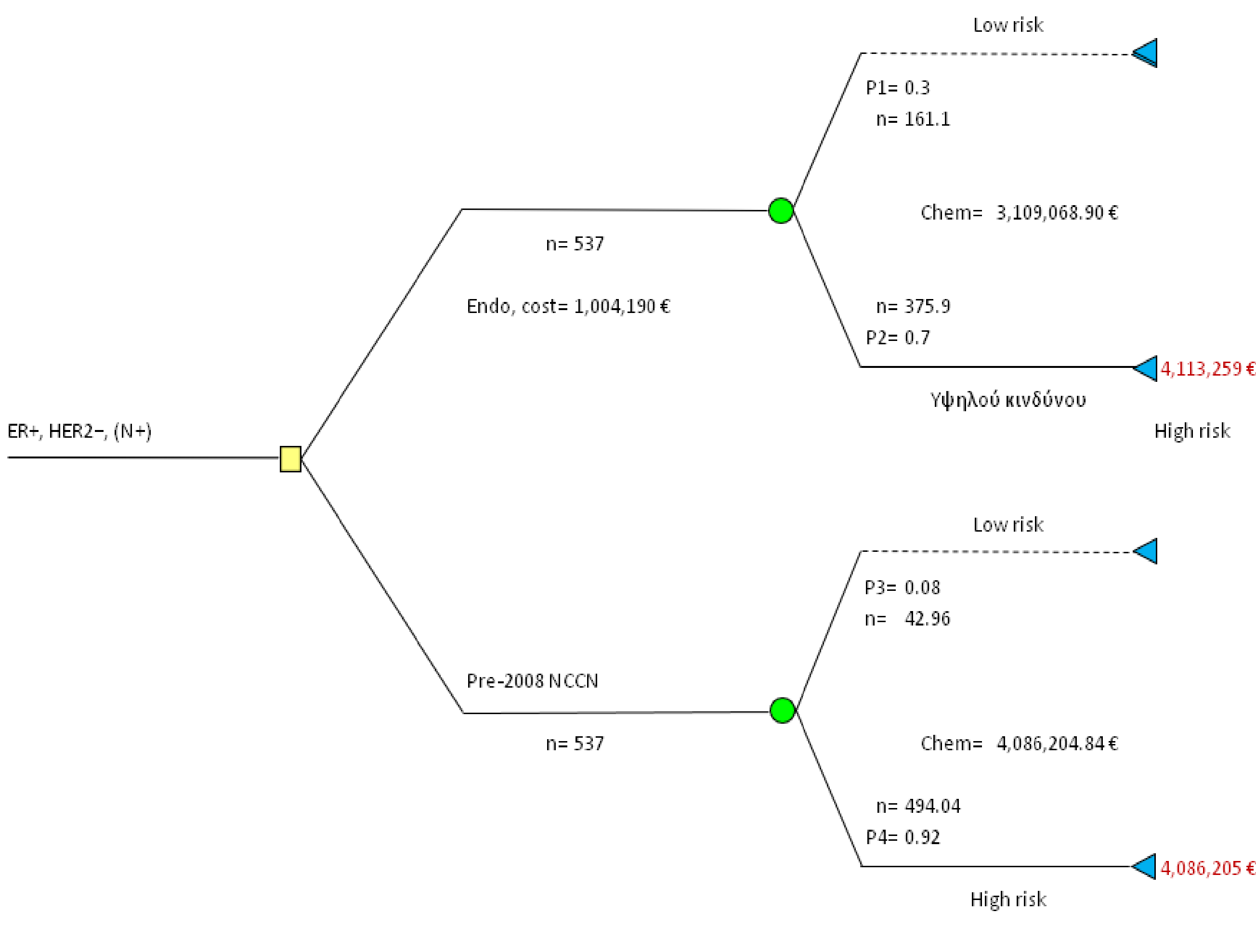
In regards to the second scenario and for a hypothetical cohort of 537 N+ (1–3 positive lymph nodes) patients, the analysis showed slightly higher economic burden of gene assay testing to the third payer and particularly €4.11 million costs compared to €4.09 million of current clinical practice.

Graph 1. Economic burden of the introduction of gene expression test for HER2-, N0 patients for Greece



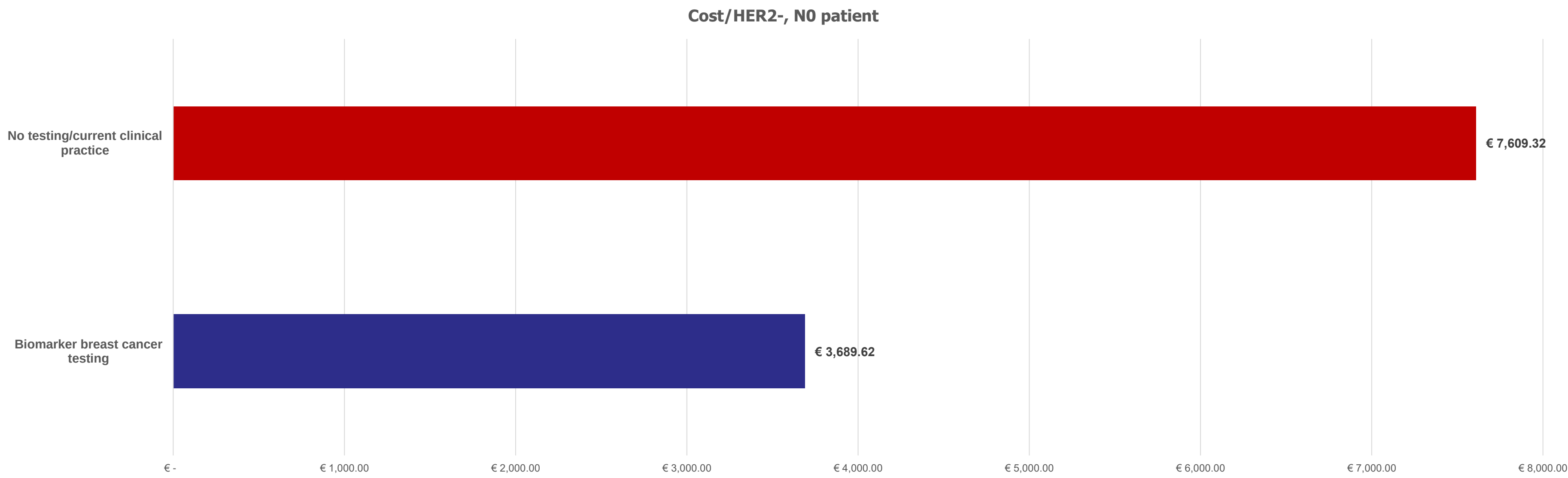
■ = Decision HR+ = Estrogen Receptor-Positive Chem = Chemotherapy Cost (N0) = Negative Lymph Node
● = Scenario HER2- = Human epidermal growth factor receptor 2 Endo, cost = Genomic breast cancer testing cost
◄ = Outcome Pre-2008 NCCN = National Comprehensive Cancer Network Guidelines, before 2008 P = Probability n = Number

Graph 2. Economic burden of the introduction of gene expression test for ER+, HER2-, and N+ patients for Greece



■ = Decision HR+ = Estrogen Receptor-Positive Chem = Chemotherapy Cost (N0) = Negative Lymph Node
● = Scenario HER2- = Human epidermal growth factor receptor 2 Endo, cost = Genomic breast cancer testing cost
◄ = Outcome Pre-2008 NCCN = National Comprehensive Cancer Network Guidelines, before 2008 P = Probability n = Number

Graph 3. Economic burden of the introduction of gene expression test compared to current clinical practice, cost per HER2-, NO patient



Conclusions

Our study highlighted the decreased direct costs of clinical practice after the introduction of the prognostic second generation 12-gene assay for the third-party payer, namely the Hellenic National Organization for the Provision of Healthcare Services (EOPYY), which is the only public payer in the Hellenic health market. In fact, savings for early-breast cancer N0 patients are higher compared to costs incurred using the current clinical practice of testing clinicopathologic indicators. The testing process can properly accompany the decision-making process and support the clinical practitioner in current clinical practice as well as the patient by providing information that may help avoid unnecessary chemotherapy. The resulting benefit for EOPYY in terms of financial resources is more than 50% compared to the current clinical practice.

References: 1) Dubsky P. et al, 2013, 2) Siskou O. et al, (2020), 3) Greek Government Gazette 58553 Ministerial Decision No. C2(d)/oik.82910/31.10.2018/No. Sheet 4868 & Greek Government Gazette 49801 Ministerial Decision, No. C2(d)/oik. 61918/12.09.2018/No. Folio 3969

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