

Budget Impact of Durvalumab for the Treatment of Patients with Unresectable Stage III Non-Small Cell Lung Cancer in the Brazilian Private Healthcare System

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Introduction

Lung cancer is the leading cause of cancer death among both men and women and accounts for about one fifth of all cancer deaths¹. It is divided into NSCLC (Non-Small Cell Lung Cancer) and SCLC (Small Cell Lung Cancer), with about 85% classified as NSCLC and 15% classified as SCLC². Lung tumors have a deep impact in the quality of patients' life, being influenced by the stage of the disease. Advanced stages are associated with significant reductions in functional capacity, physical and mental health aspects^{3,4}.

The late diagnosis of NSCLC in Brazil is due to its insidious growth, often asymptomatic or oligosymptomatic, as well as potential redundancies in the healthcare system that hinder immediate access of accurate diagnosis and appropriate treatment^{5,6}. Less than 50% Brazilian patients diagnosed with NSCLC stage III survive more than one year after diagnosis⁷.

Durvalumab consolidation has a curative intent for patients with stage III (NSCLC) after chemoradiation and drastically improved clinical outcomes with a reduction of 41% and 45% in the risk of metastasis and disease progression, respectively. This research aims to estimate the potential saving in NSCLC stage IV after durvalumab treatment in the Brazilian private healthcare system (ANS).

Methods

The budget impact analysis was modeled considering a Markov model with three health states: Progression Free Survival (PFS), Disease Progression (DP), and Death (Figure 1). The time horizon considered was 5 years. Progression state considered stage IV NSCLC, and treatments considered for the cost composition were: chemotherapy, target therapies and immunotherapies.

Only direct medical costs from a healthcare payer perspective were considered. Drug acquisition costs were extracted from the list price regulated by Câmara de Regulação do Mercado de Medicamentos (CMED); tests and procedures costs were extracted from private healthcare standard tables (CBHPM and Planserv). The usage frequency related to drug treatment in the progression stage was validated in a expert panel. Clinical data was captured from PACIFIC study curves (OS and PFS)⁸. Epidemiological data were obtained from published medical literature on stage III NSCLC, as related in the Figure 2.

Figure 1. Schematic of the study model - methodology

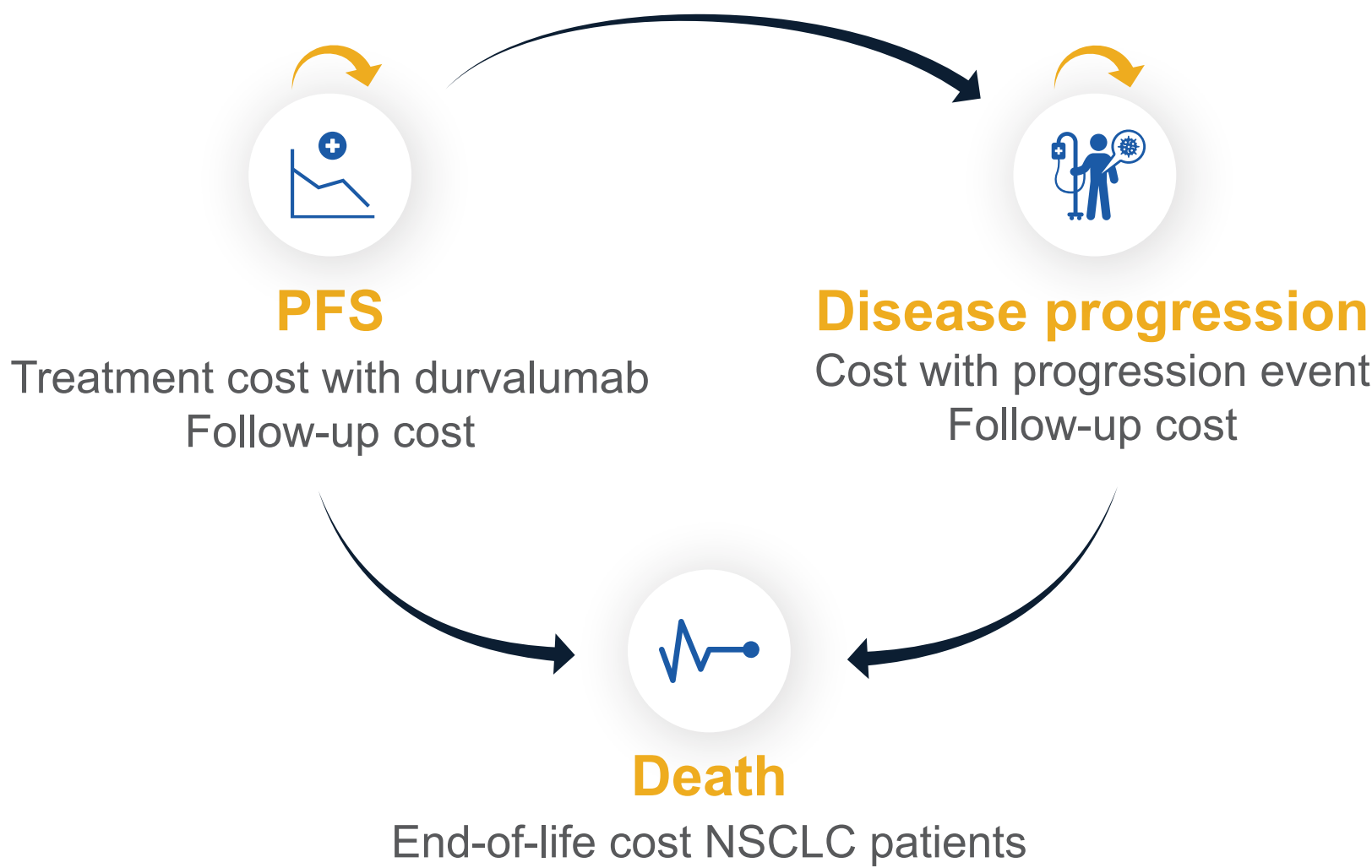
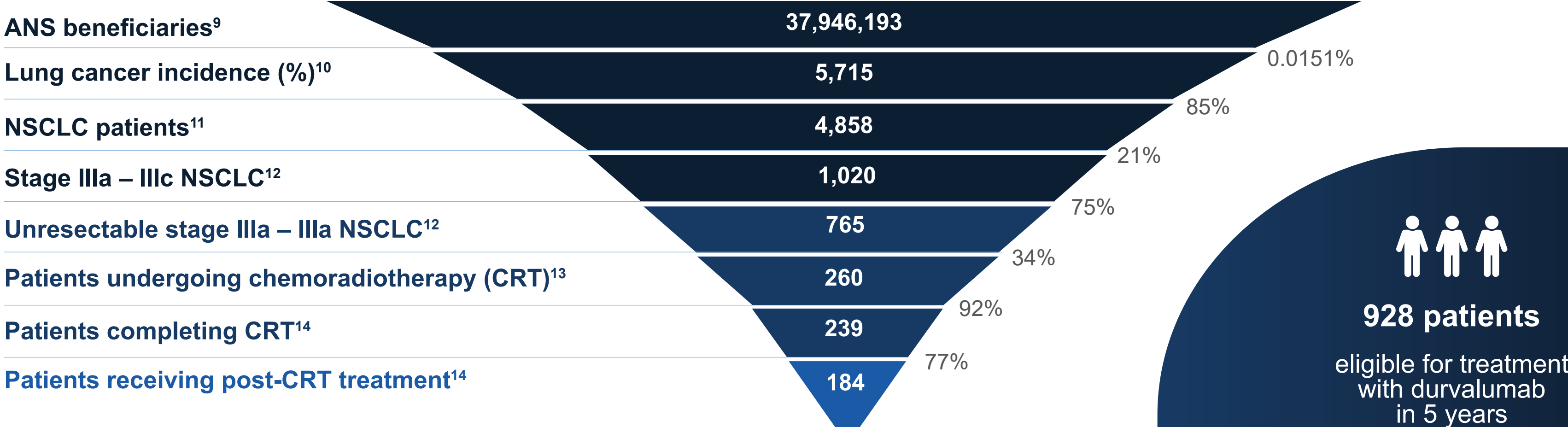


Figure 2. Projection of patients eligible for treatment with durvalumab



Number of eligible patients through the 5 years were calculated considering adult population increase from IBGE. The market share was assumed 50% in year-1 and rising over time to 100% in year- 5, resulting in a scenario named “without durvalumab” (with 0% of patients treating with durvalumab through 5 years), and a scenario named “with durvalumab” (with the market share uptake through 5 years) (Figure 4).

Figure 3. Number of patients per disease stage

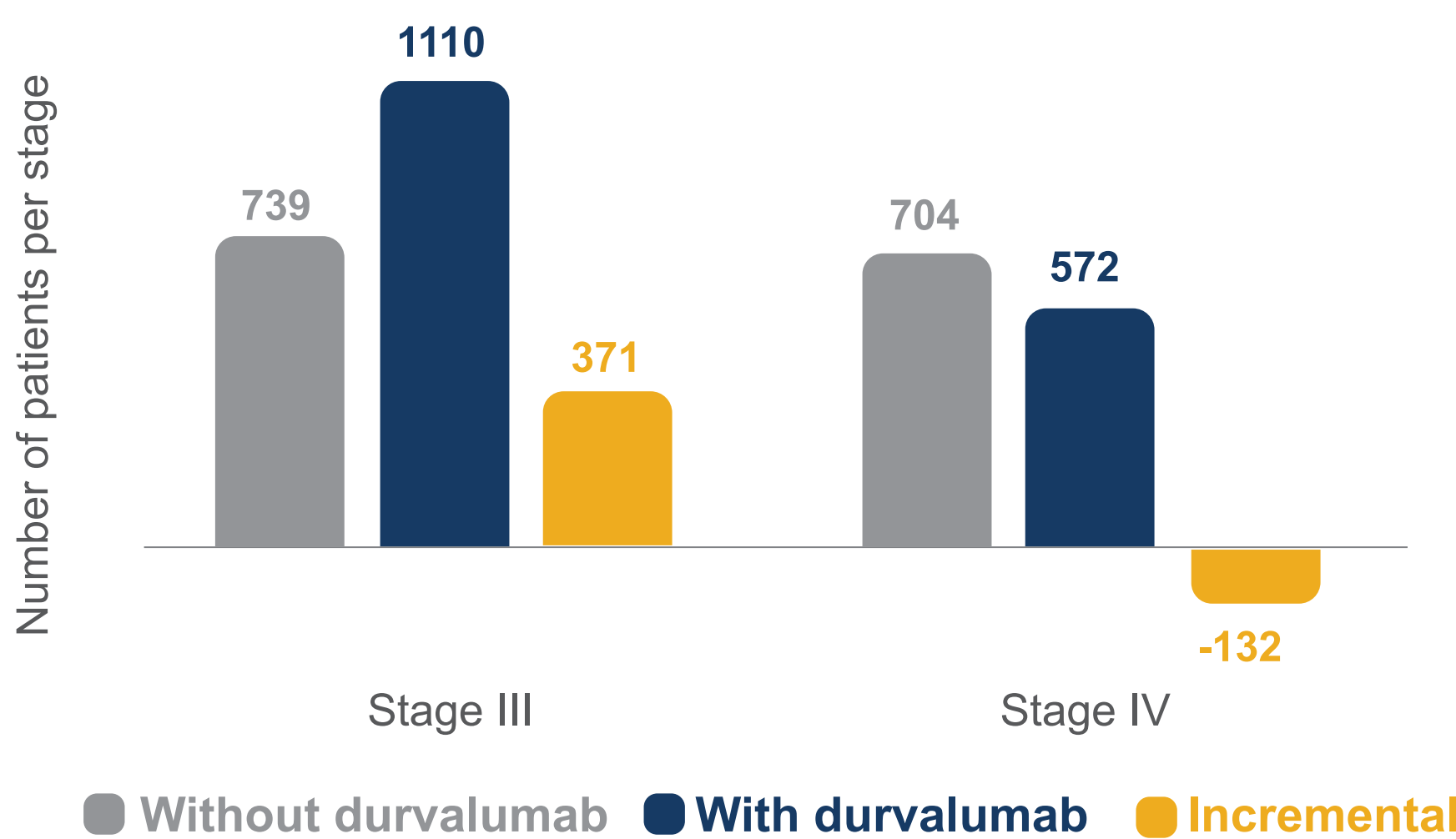
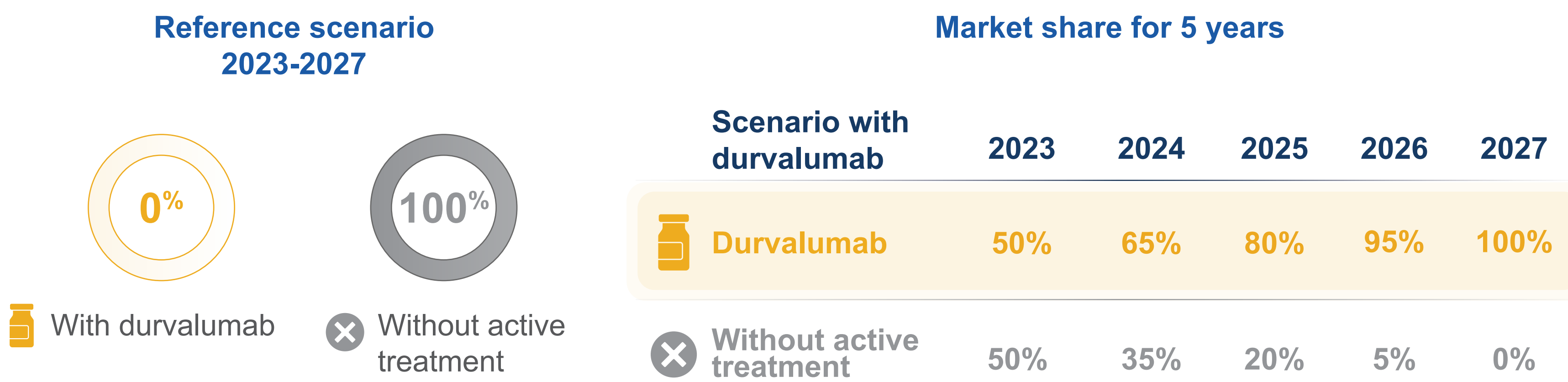


Figure 4. Estimated market share in the current scenario and after incorporation of durvalumab



Results

Treatment with durvalumab led to a reduction of 132 patients who progressed to stage IV (Figure 3). The model yielded a saving of BRL 729,618.22 in the stage IV treatment per patient in the scenario with durvalumab usage (Figure 5). The total budget saving with durvalumab usage was BRL 36,580,807.54 over the 5-years, in the private health perspective (Figure 6). The market share percentages applied in budget impact calculation are detailed in Figure 4.

Figure 5. Costs per disease stage

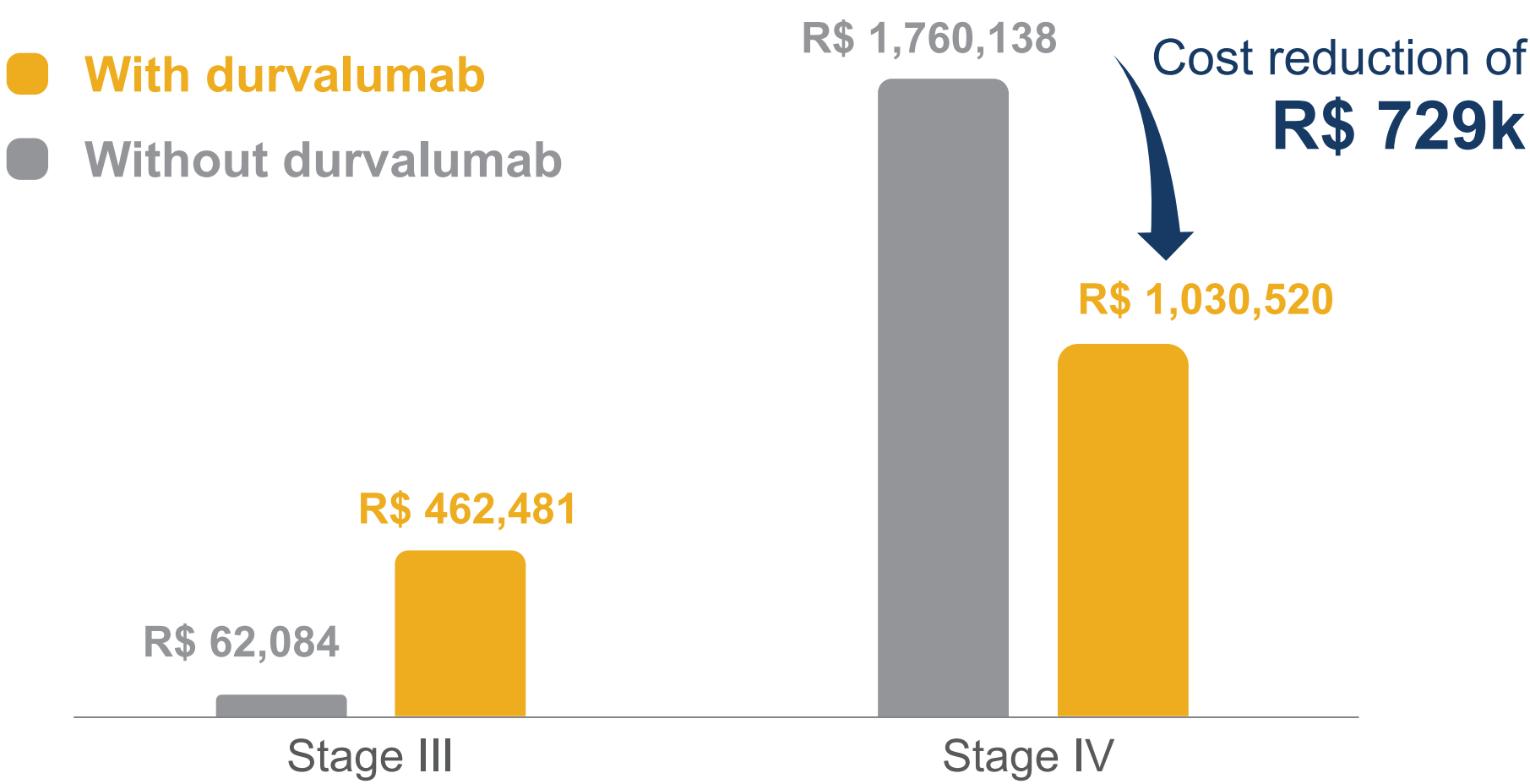
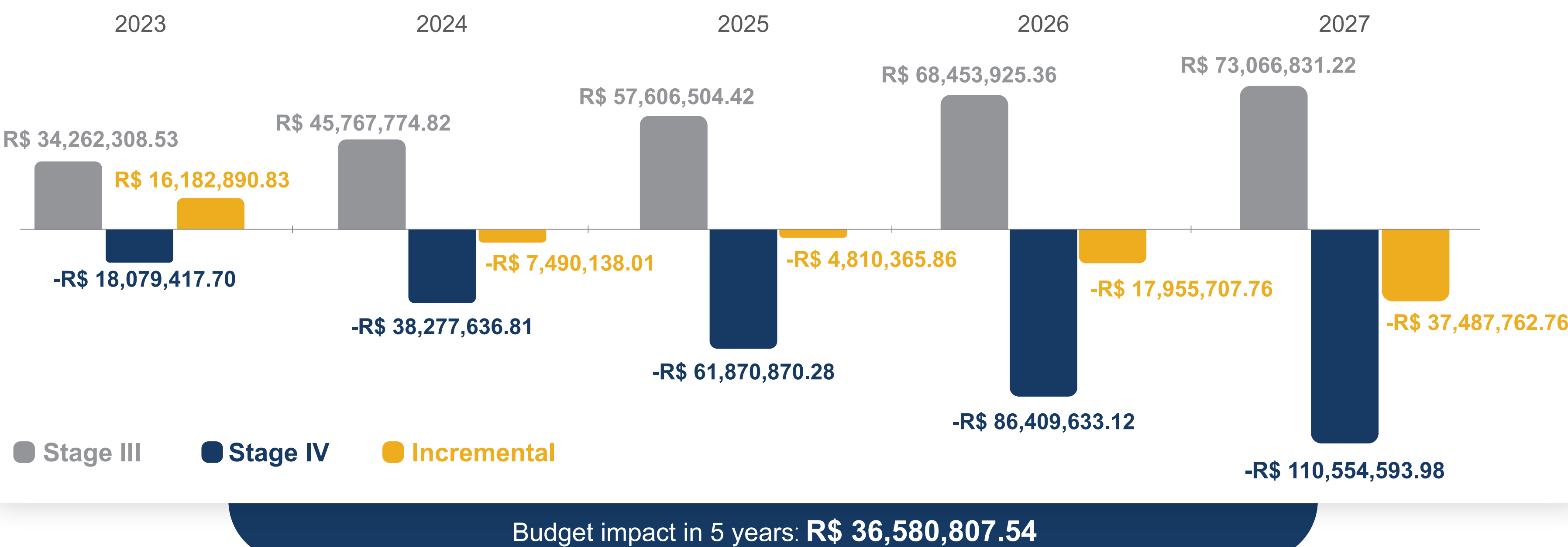


Figure 6. Budget impact per year



Conclusion

The use of durvalumab as consolidation therapy in stage III disease could lead to substantial saving in NSCLC treatment. The saving was mainly driven by the reduction of patients progressing to stage IV as well as the reduction of costs associated with progressive disease and death.

References: ANS: Agência Nacional de Saúde; CMED: Câmara de Regulação do Mercado de Medicamentos; CRT: Chemoradiotherapy; DP: Disease progression; IBGE: Instituto Brasileiro de Geografia e Estatística; PFS: Progression-free survival; OS: Overall survival; NSCLC: Non-Small Cell Lung Cancer; SCLC: Small-cell lung cancer. 1. World Health Organization. International Agency for Research on Cancer. Lung Fact Sheet. Available at: <http://gco.iarc.fr/today/data/factsheets/cancers/15-Lung-fact-sheet.pdf> Accessed in: 09/10/2023. 2. UNGevity Foundation. Types of Lung Cancer. Available at: <https://ungeevity.org/for-patients-care-givers/lung-cancer-101/types-of-lung-cancer> Accessed in: 09/10/2023. 3. Franceschini J, Santos AA, Mouallem I, et al. Avaliação da qualidade de vida em pacientes com câncer de pulmão através da aplicação do questionário Medical Outcomes Study 36-Item Short-form Health Survey. J Bras Pneumol. 2008;34(6):387-93. 4. Detterbeck FC, Boffa DJ, Kim AW, et al. The eighth edition lung cancer stage classification. Chest. 2017;151(1):193-203. 5. Molina JR, Yang P, Cassivi SD, Schild SE, Adjei AA. Non-Small Cell Lung Cancer: Epidemiology, Risk Factors, Treatment, and Survivorship. Mayo Clin Proc. 2009;84:984-994. 6. Lista M, Bes FC, Pereira JR, et al. Excessiva demora no diagnóstico clínico do câncer de pulmão. Depende do médico, do paciente ou do sistema? Arq Med Hosp Fac Cienc Med Santa Casa São Paulo. 2008;7:1454-1461. 7. Ferreira CG, Abadi MD, de Mendonça Batista P, et al. Demographic and Clinical Outcomes of Brazilian Patients With Stage III or IV Non-Small-Cell Lung Cancer: Real-World Evidence Study on the Basis of Deterministic Linkage Approach. JCO Glob Oncol. 2021;7:1454-1461. 8. Antonia SJ, Villegas A, Daniel D, et al. Durvalumab after Chemoradiotherapy in Stage III Non-Small-Cell Lung Cancer. New England Journal of Medicine. 2017;377:1919-29. 9. ANS. Dados do setor. Available at: <https://www.gov.br/ans/pt-br/acesso-a-informacao/perfil-do-setor> Accessed in: 09/10/2023. 10. INCA. Available at: <https://www.inca.gov.br/sites/ufu.sti.inca.local/files/media/document/estimativa-2023.pdf> Accessed in: 09/10/2023. 11. Schabath MB, Cote ML. Cancer Progress and Priorities: Lung Cancer. Cancer Epidemiol Biomarkers Prev. 2019;28(10):1563-1579. 12. Datta D, Lahiri B. Preoperative evaluation of patients undergoing lung resection surgery. Chest. 2003;123(6):2096-103. 13. Martin, 2022. 14. Horinouchi, 2020.