

BUDGET IMPACT OF GLOBAL LONGITUDINAL STRAIN FOR THE EARLY DETECTION OF CARDIOTOXICITY INCORPORATION IN THE BRAZILIAN PRIVATE HEALTHCARE SYSTEM

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INTRODUCTION AND JUSTIFICATION

Cardiotoxicity is one of the main adverse events resulting from the use of chemotherapy, being associated with comorbidities and increased mortality. The increased survival of cancer patients is accompanied by an increased risk of developing cardiovascular toxicity [1].

Usually, recommendations for diagnosis of chemotherapy-induced cardiac dysfunction use conventional echocardiography parameters. However, they allow only the late diagnosis of cardiac dysfunction, which may be irreversible. Therefore, there is a great need for parameters capable of early detection of left ventricular (LV) dysfunction and therefore able to identify patients at risk of rapid progression to irreversible heart failure who may benefit from early therapeutic measures [2,3].

METHODS

Population: epidemiological approach, based on the prevalence of cancer, proportion of cancer patients treated with anthracyclines and proportion of patients covered by health plans [4,5,6,7];

Model: Markov type transitional state model (Fig. 1) [8];

Costs:

- **Scenario 1:** considering only the cost of GLS and ECO
- **Scenario 2:** Cost of procedures in addition to direct medical costs related to the management of cardiotoxicity and heart failure.

Perspective: Brazilian Private Healthcare System;

Sensitivity analysis: Probabilistic sensitivity analyses were performed to explore parametric uncertainties.

OBJECTIVES

To estimate the budget impact of incorporating global longitudinal strain (GLS) for the early detection of cardiotoxicity in patients under cancer treatment, compared to conventional echocardiographic measurements (ECO) in the Brazilian Private Healthcare System (PHS).

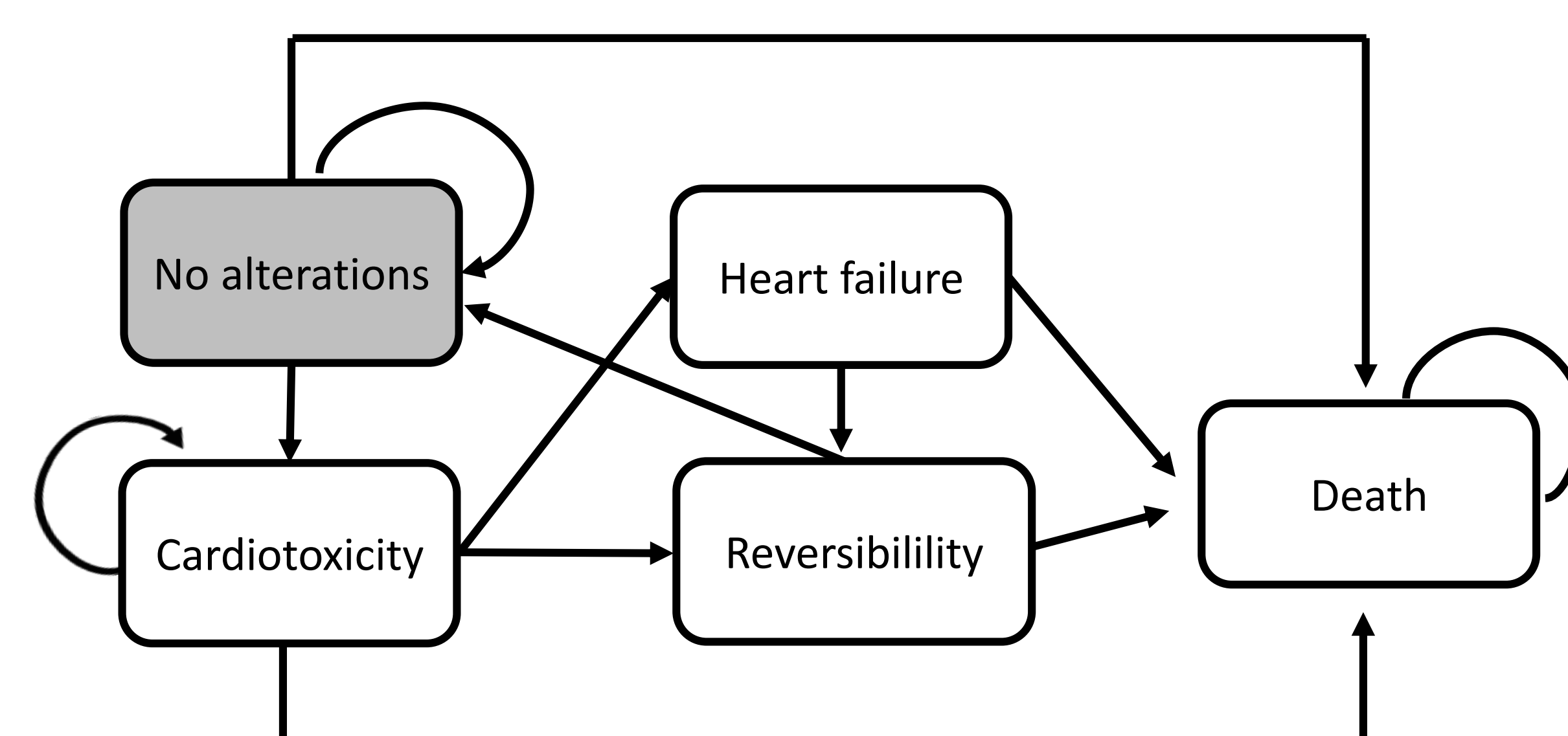


Fig1. Transitional state model.

RESULTS

- The initial eligible population was estimated in 209,657 patients (Table 1).
- An increase of 10% per year was estimated in performing GLS procedure over ECO as market share. The number of patients using each procedure is presented in Table 2.
- The scenario considering only GLS and ECO procedures costs resulted in a positive BI, from BRL3.6 million in the first year to R\$ 59 million in the fifth year.
- Considering total costs, the incorporation of GLS has the potential to result in savings to PHS from the fourth year of incorporation. In the fifth year the economy reaches about R\$ 9 million.

Table1. Eligible population

	Year 1	Year 2	Year 3	Year 4	Year 5
Brazilian population ≥ 18	158,255,554	160,044,909	161,775,439	163,465,276	165,088,471
PHS population	36,398,777	36,810,329	37,208,351	37,597,013	37,970,348
Population with cancer	655,178	662,586	669,750	676,746	683,466
Treated with anthracyclinc	209,657	212,027	214,320	216,559	218,709

PHS: Brazilian Private Healthcare System

Table2. Eligible population

Current scenario	Year 1	Year 2	Year 3	Year 4	Year 5
ECO	209.657	212.027	214.320	216.559	218.709
GLS	0	0	0	0	0
Proposed scenario	Year 1	Year 2	Year 3	Year 4	Year 5
ECO	188.691	169.622	150.024	129.935	109.355
GLS	20.966	42.405	64.296	86.624	109.355

GLS - global longitudinal strain; ECO - conventional echocardiographic measurements

- Deterministic results are corroborated by the probabilistic analyses. Fig. 3 demonstrates probabilistic analysis, in which values below the line represent savings to the health system, while values above the line represent an incremental cost in the proposed scenario compared to the current one.

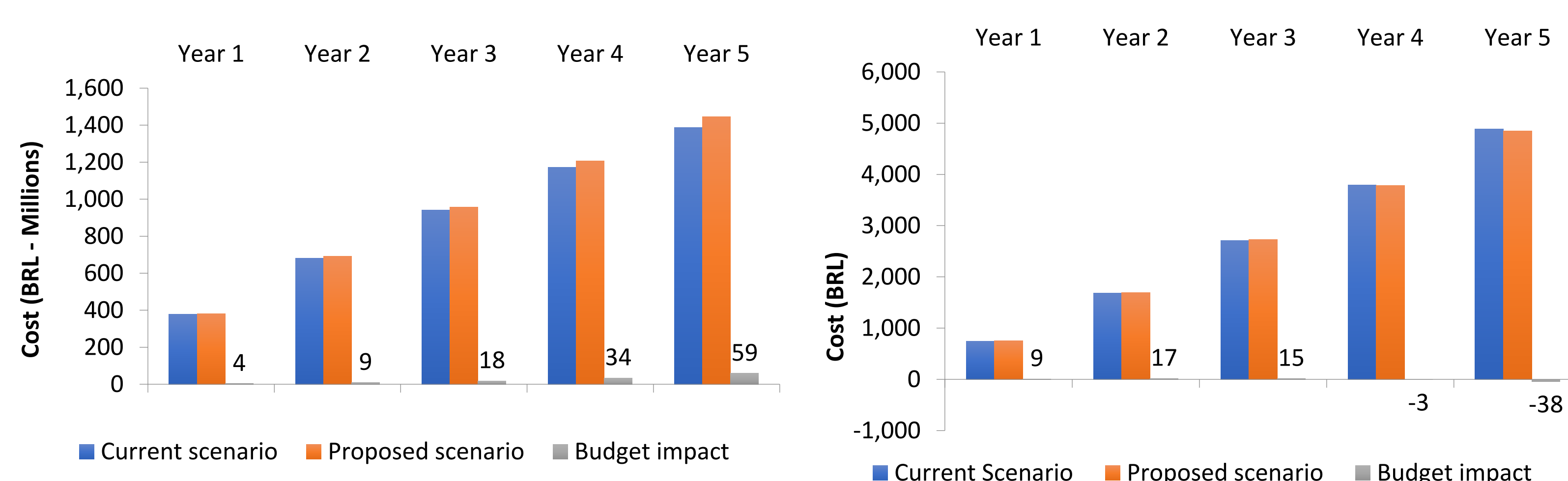


Fig 2.. Budgetary impact of incorporating SGL considering only the cost of procedures (A) and total treatment costs (B).

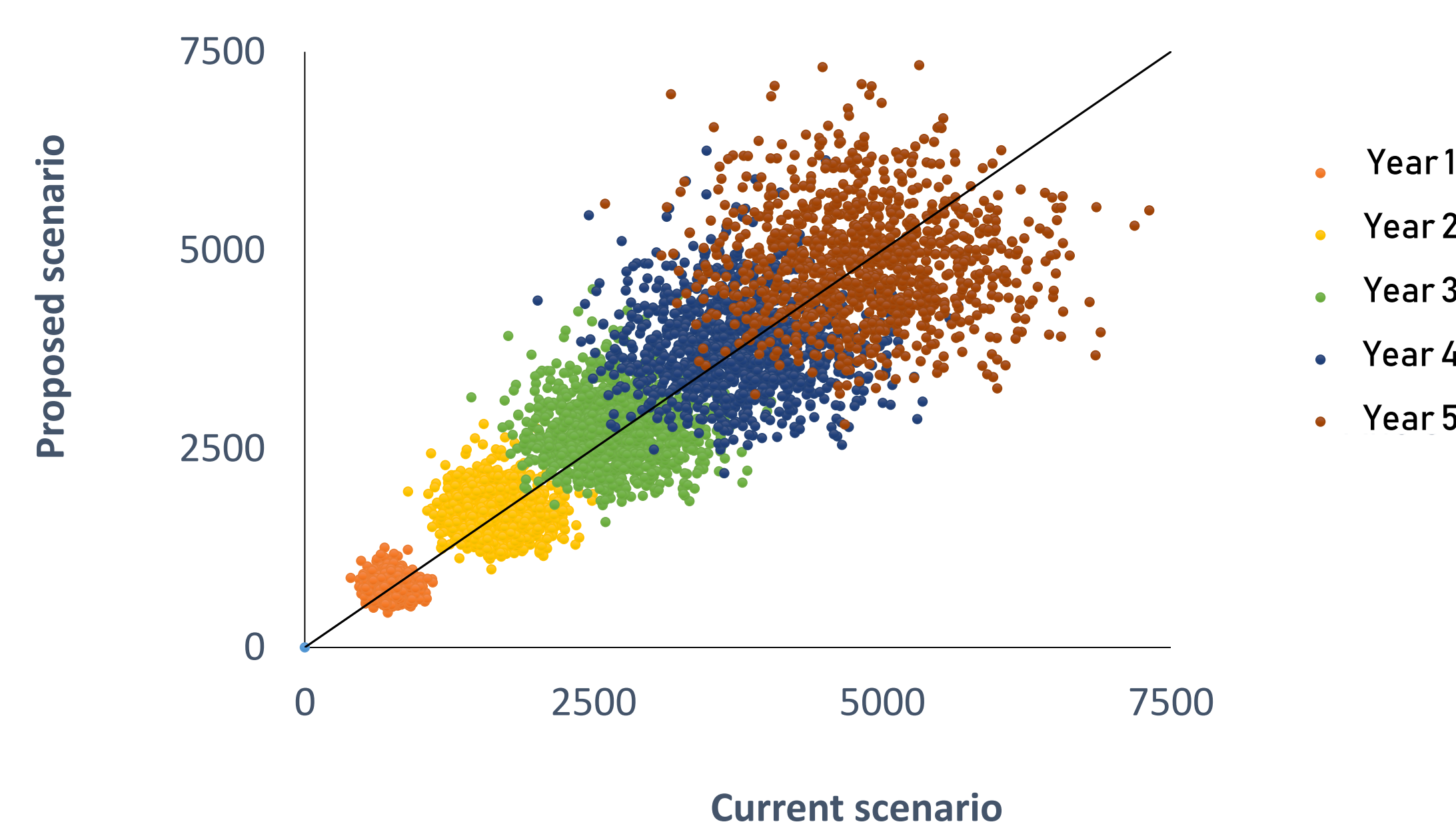


Fig 3. Probabilistic analysis

CONCLUSIONS

Cardiotoxicity has a major impact in cancer patients treated with anthracyclines, being associated with increased risk of heart failure and mortality. Since GLS has the potential of early detection of cardiotoxicity, allowing the rapid onset of treatment, the use of GLS has the potential to promote savings for the private healthcare system.

References

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