

COST-EFFECTIVENESS ANALYSIS OF CRIZOTINIB VERSUS CHEMOTERAPY FOR FIRST LINE TREATMENT OF NON-SMALL CELL LUNG CANCER ALK+, FROM THE BRAZILIAN PUBLIC HEALTHCARE SYSTEM PERSPECTIVE

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INRODUCTION

Lung cancer (LC) has clinical and epidemiological importance, becoming relevant in the process of planning and managing health actions in the oncology field. LC is one of the most prevalent cancers in men and women and has the highest mortality rate of all cancers except non-melanoma skin cancer (excluding non-melanoma skin cancer) (1-3). According to the literature, approximately 85% of cases are non-small cell lung cancer (NSCLC) (4,5) and, among these, approximately 3% presents the ALK+ translocation (6). It is important to highlight that ALK translocation is a separate clinical entity, and highly responsive to treatment directed to the molecular event which induces this cancer.

OBJECTIVE

The aim of this analysis is to compare incremental cost-effectiveness ratio (ICER) between crizotinib and standard chemotherapy in the ALK+ NSCLC treatment from the Brazilian public healthcare system perspective.

METHODS

A cost-effectiveness analysis was developed using a partitioned survival model, which followed patients with advanced ALK+ NSCLC throughout a lifetime horizon, considering the transition through different health states (progression-free survival, progression, and death).

The analysis was conducted from the perspective of the Brazilian public healthcare system, and the outcomes evaluated monthly on the model were life years gained (LY) and quality-adjusted life years gained (QALY).

In addition, it was conducted sensitivity analysis (deterministic and probabilistic) in order to evaluate the impact of the variation of some parameters on the results.

RESULTS

The analysis showed that crizotinib provides gains in terms of LY (3.67) and QALY (1.84) when compared to standard chemotherapy, with the need for incremental costs, resulting in an ICER/LY of approximately BRL 42,000 and ICER/QALY of BRL 83,500. It is important to note that, as patients using crizotinib remain on treatment longer than chemotherapy, given its superiority in terms of PFS, an incremental cost in the model is expected.

Table 1. Results of the cost-effectiveness analysis for first-line treatment of advanced ALK+ non-small cell lung cancer, from the Brazilian public healthcare system perspective.

	Crizotinibe	Chemotherapy	Incremental
Total cost (R\$)	187,936.62	33,955.71	153,980.90
Treatment cost (R\$)	95,046.10	4,876.65	90,169.45
Cost in the state without progression - PFS (R\$)	7,131.49	4,070.44	3,061.05
Cost in progression state (R\$)	84,678.08	23,445.86	61,232.22
Cost in the death state (R\$)	835.10	1,045.59	-210.49
Cost of adverse events management (R\$)	245.84	517.17	-271.33
Life years gained	5.47	1.79	3.67
ICER (R\$ / LY)			41,912.93
Quality-adjusted life years (QALY)	2.83	0.99	1.84
ICER (R\$ / QALY)			83,573.70

PFS: progression-free survival; LY: life years; QALY: quality-adjusted life years gained

The ICER/QALY is only 2.4 times the Brazilian GDP per capita, which is within the recent established threshold for serious diseases (3 times Brazilian GDP per capita).

The results for deterministic sensitivity analysis showed that the parameters that most impacts the results of the analysis were the discount rate, post progression follow-up costs and utility values; however, without significant changes in the results, as shown on Figure 1.

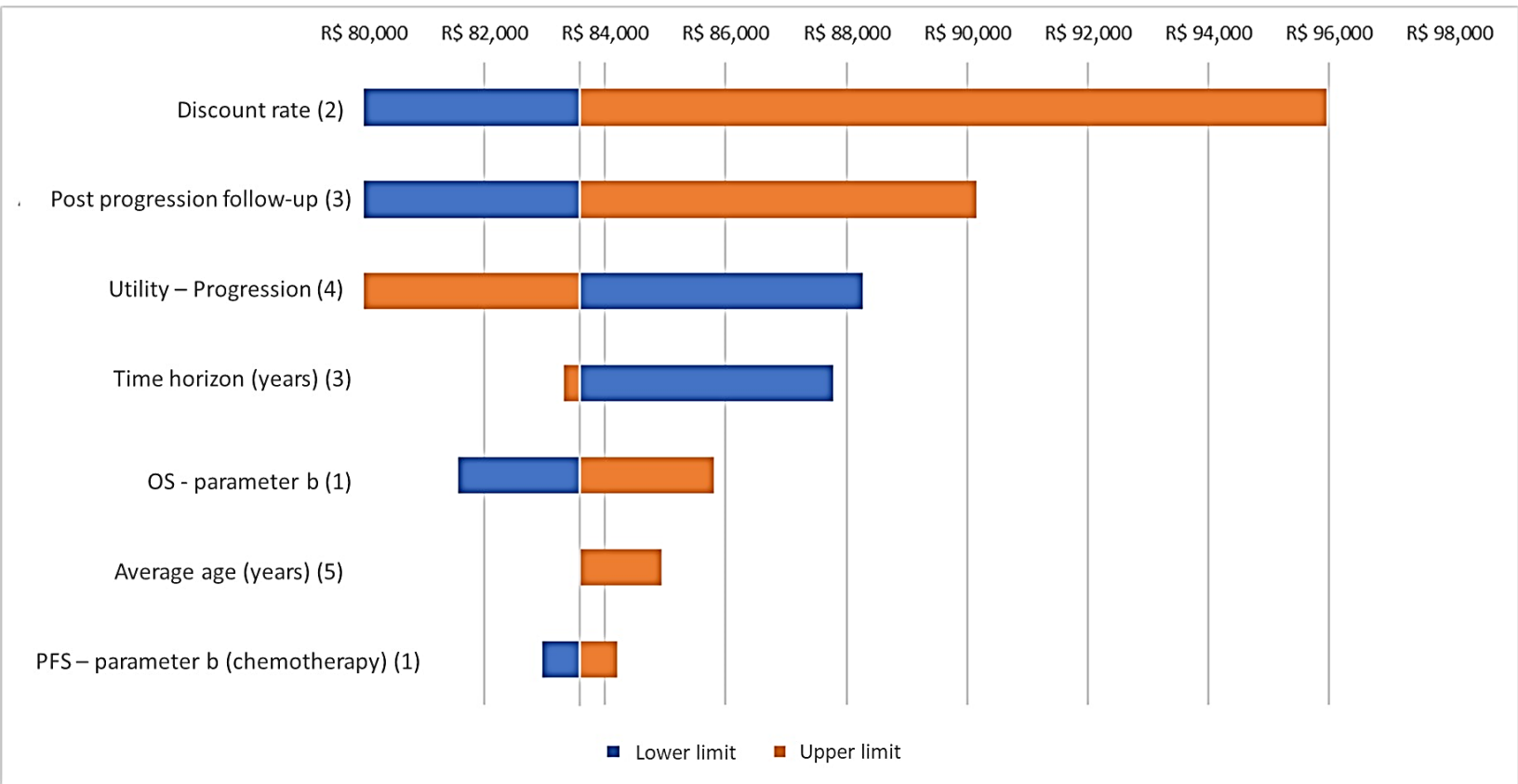


Figure 1. Results of the deterministic sensitivity analysis for the outcome quality-adjusted life years (QALY).

The results of the probabilistic sensitivity analysis showed that 100% of the iterations remained in the quadrant where there is a greater cost and clinical benefit (Figure 2). The results remained consistent with those found in the base case scenario, where 99.2% of the iterations indicates an ICER/QALY within the threshold for serious diseases.

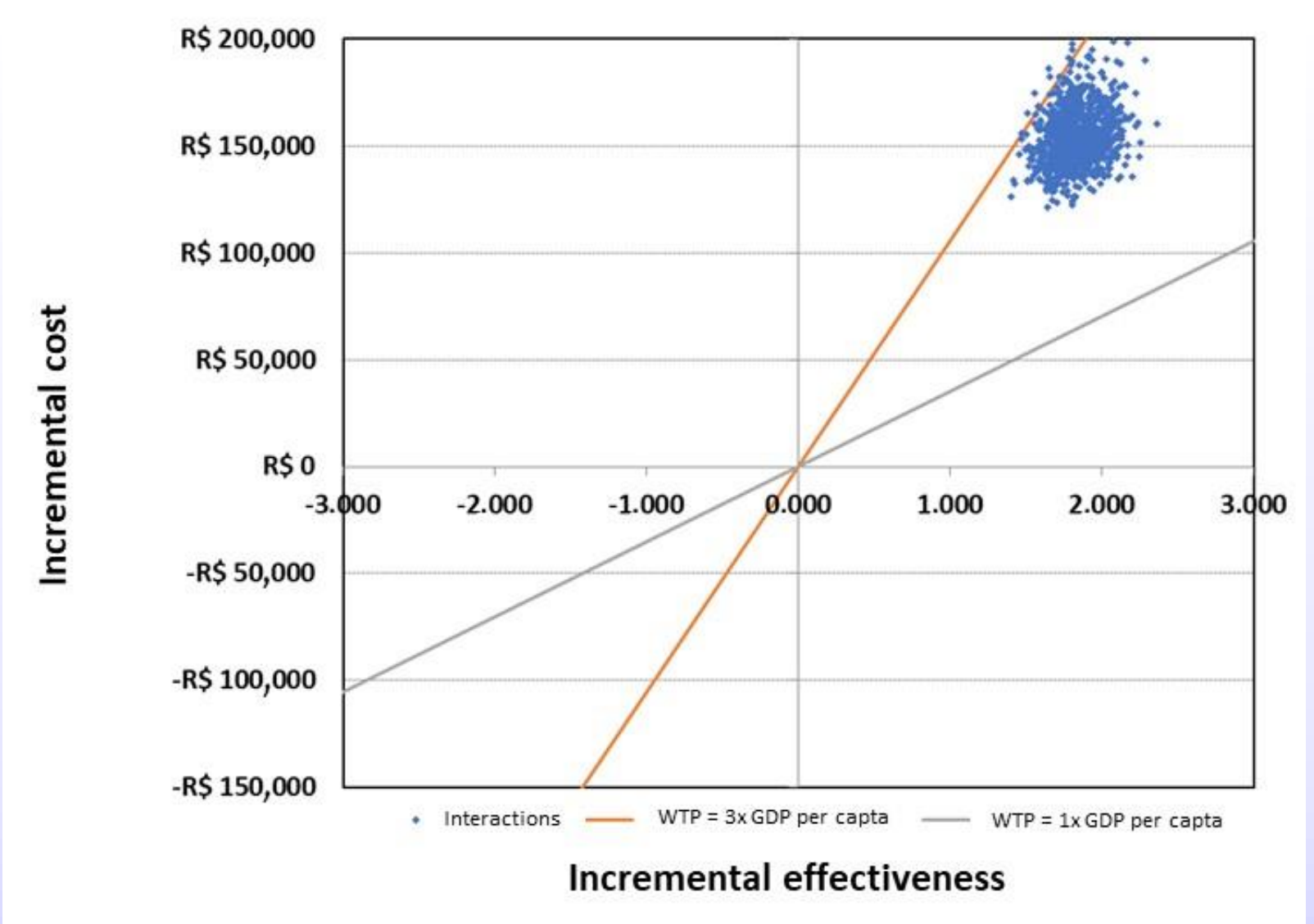


Figure 2. Results of the probabilistic sensitivity analysis – Cost-effective plans (outcome: QALY).

CONCLUSION

Considering that crizotinib provides significant gains compared to chemotherapy in the treatment of advanced ALK+ NSCLC in first line, it was incorporated into the Brazilian public healthcare system in December 2022.

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