

Economic Evaluation of Lung Cancer Screening with Low-Dose Computed Tomography in Brazil



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OBJECTIVE

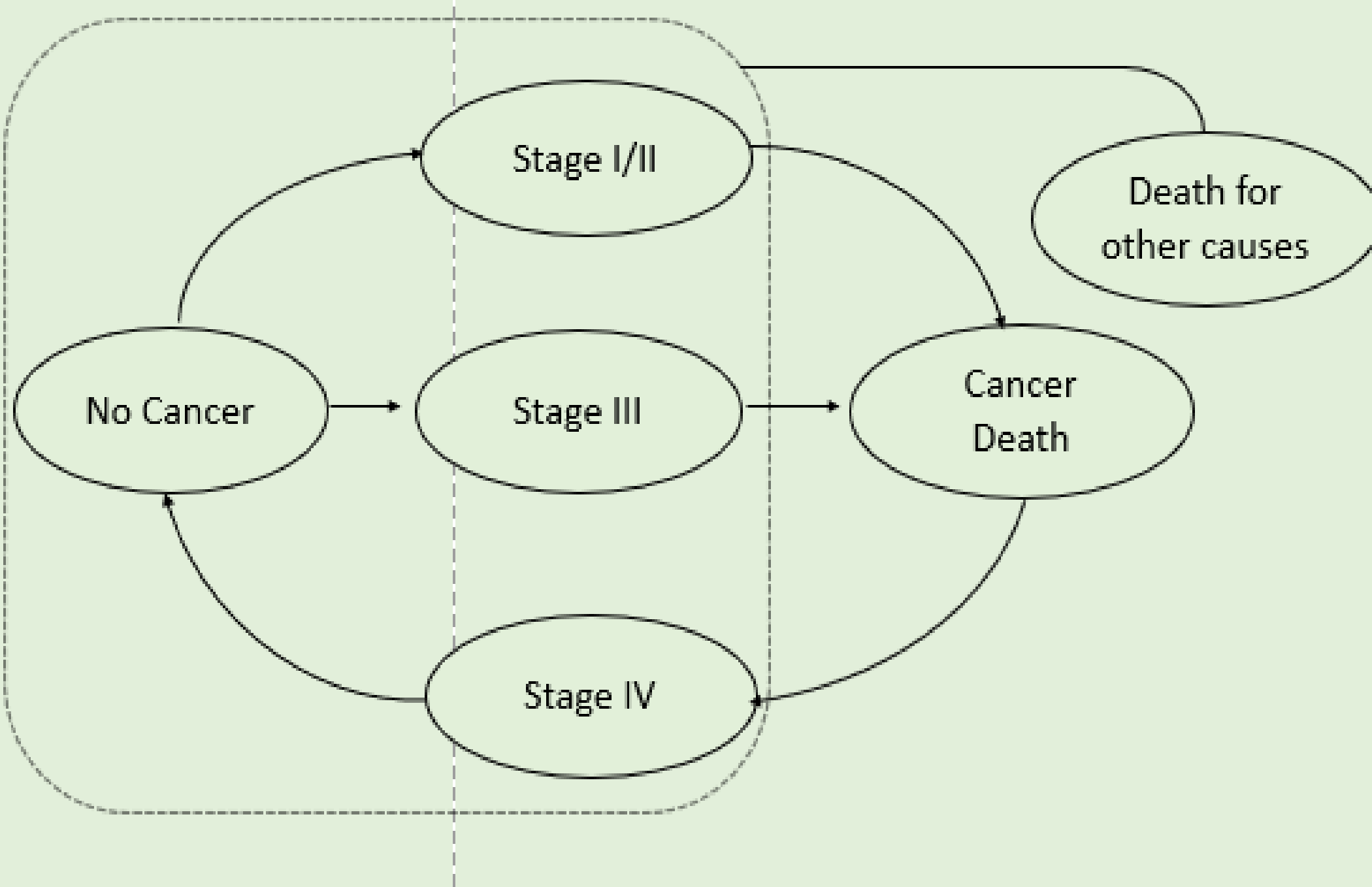
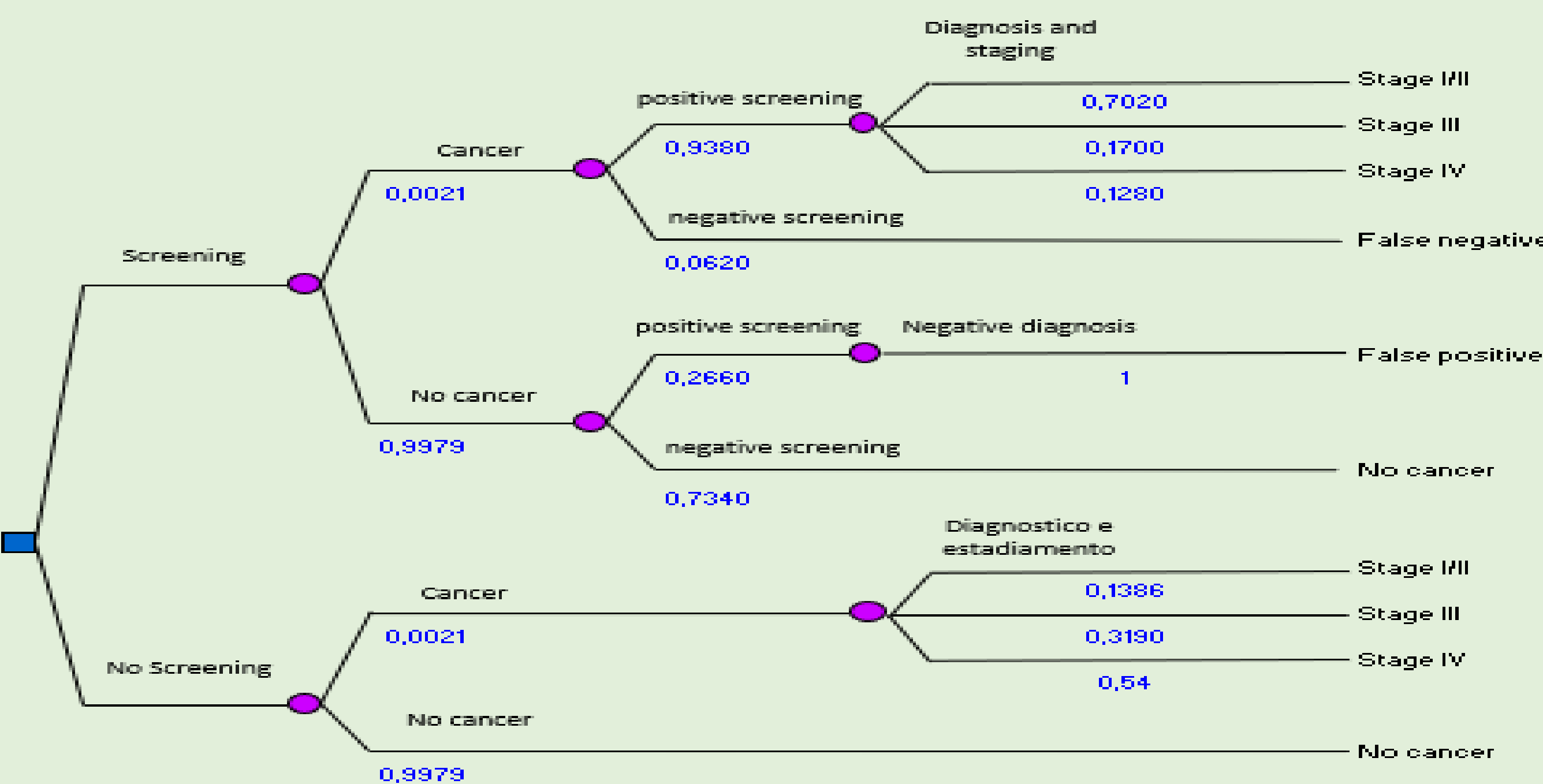
Aimed to estimate the cost-effectiveness of lung cancer (LC) screening with low-dose computed tomography (LDCT) for high-risk individuals in Brazil.

RESULTS

Compared with no screening, annual and biennial strategies were considered cost-effective according to the Brazilian cost-effectiveness threshold of US\$ 19,090.00 per LYG. Incremental cost-effectiveness rates (ICER) were US\$ 17,742.45/LYG and US\$ 10,298.58/LYG for annual and biennial screening, respectively. In probabilistic sensitivity analysis, screening was cost-effective in 94.2% of the simulations for the biennial and 52% for the yearly strategies. The ICER was more sensitive to assumptions regarding LC incidence as the other most relevant parameters (screening sensitivity for LC or stage I/II detection) had no impact on the final results.

METHODS

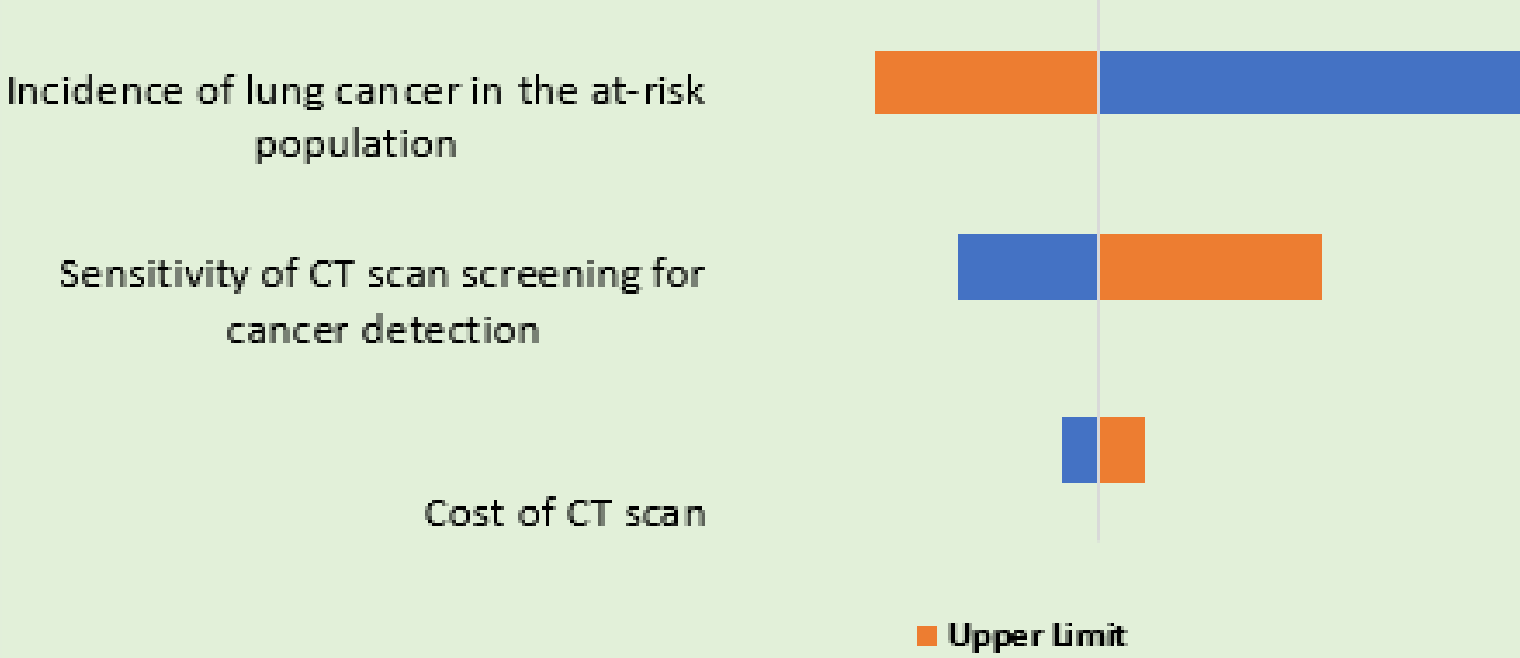
- LDCT screening strategies (annual or biannual) compared with not screening
- Brazilian unified health system perspective
- Cohort of heavy smokers (20 pack-years) screened from age 50 until 70 years old.
- Decision tree combined with a state-transition Markov model as modeling approach.
- The decision tree estimated in each screening round, the number of LC cases diagnosed and the associated costs, based on LDCT accuracy.
- The Markov model estimated costs and health outcomes accrued throughout
- Time horizon was lifetime of individuals with LC according to the cancer stage at diagnosis.
- Direct medical costs were included related to screening, diagnosis, and treatment.
- Outcomes measured in life-years gained (LYGs).
- Annual discount rate was 5% applied to costs and outcomes.
- Deterministic and probabilistic sensitivity analyses were performed.



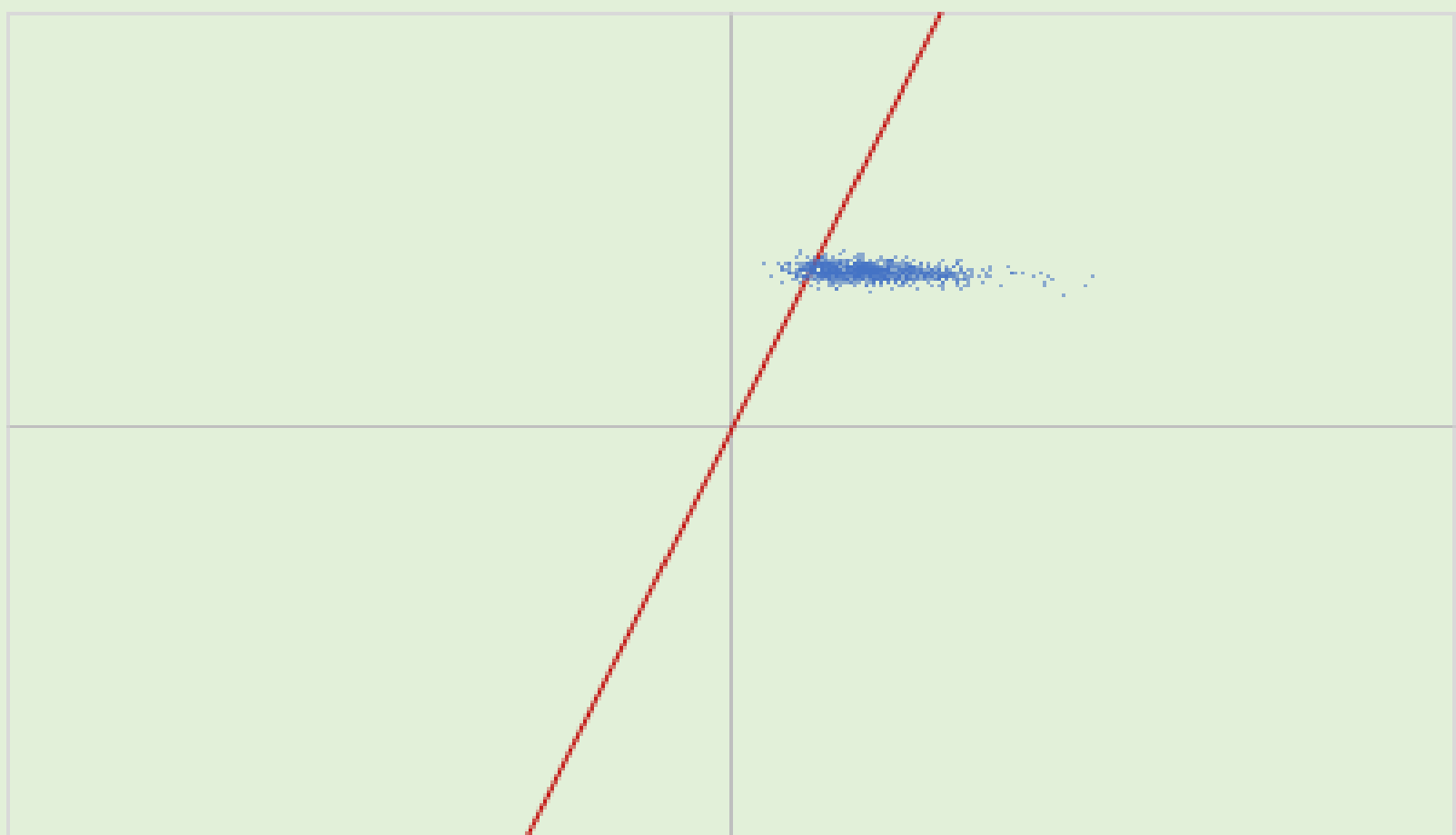
Biennial Screening

Scenario	Costs (US\$)	Life Year Gained (LYG)	Incremental life years	Custo incremental (US\$)	RCEI (US\$/ano de vida ganho)
No screening	68.23	12,6568	—	—	—
Biennial screening	265.83	12,6765	0,0198	203.64	US\$ 10,298.58

Tornado Biennial Screening

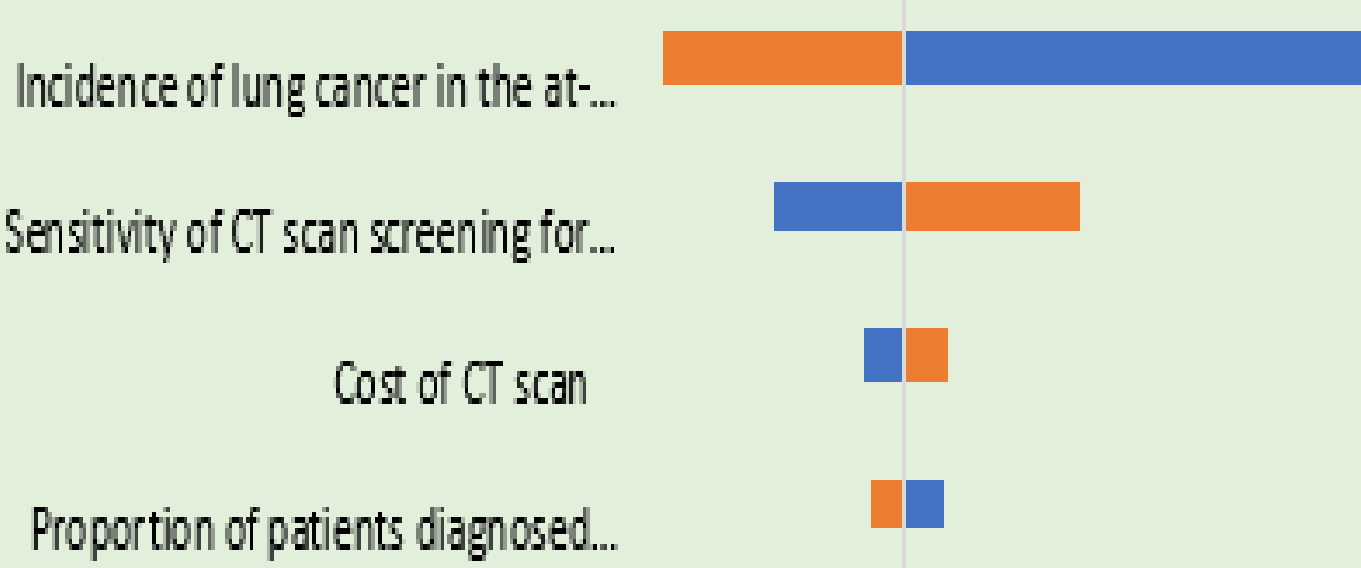


Monte Carlo Biennial Screening

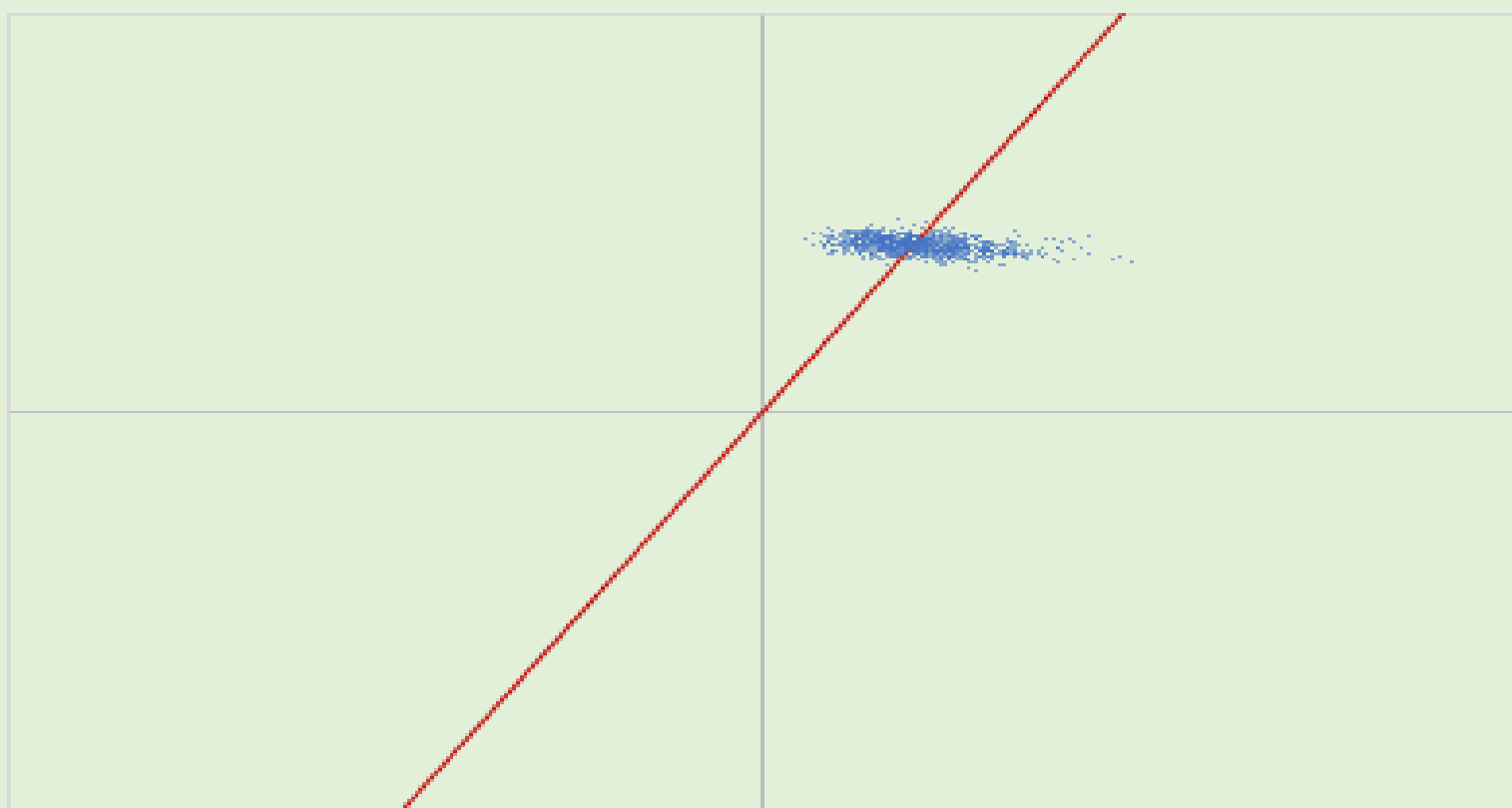


Scenario	Costs (US\$)	Life Year Gained (LYG)	Incremental life years	Custo incremental (US\$)	RCEI (US\$/ano de vida ganho)
No screening	68.23	12,6568	—	—	—
Annual screening	449.83	12,6783	0,0215	381,6	R\$ 17.742,46

Tornado Annual Screening



Monte Carlo Annual Screening



CONCLUSION

The LDCT screening for early detection of lung cancer in high-risk individuals could be cost-effective in Brazil. The results suggest that screening every two years should be the preferred strategy. Further analysis of different target populations and screening strategies could contribute to better informing policymakers.

CONTACT INFORMATION

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