

PERSONALISED VERSUS STANDARD DOSIMETRY FOR SELECTIVE INTERNAL RADIATION THERAPY IN PATIENTS WITH HEPATOCELLULAR CARCINOMA: A COST-EFFECTIVENESS ANALYSIS

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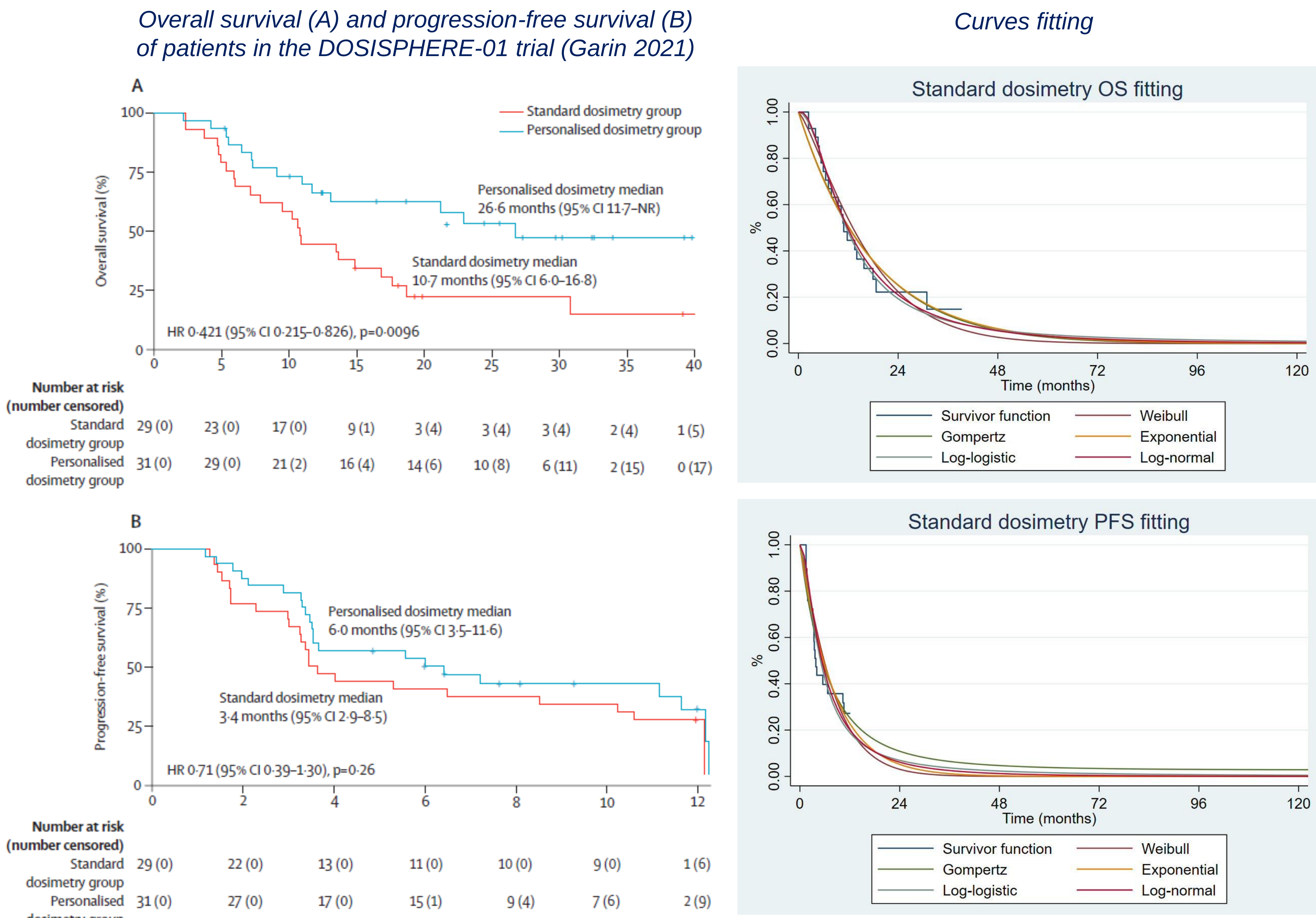
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OBJECTIVES

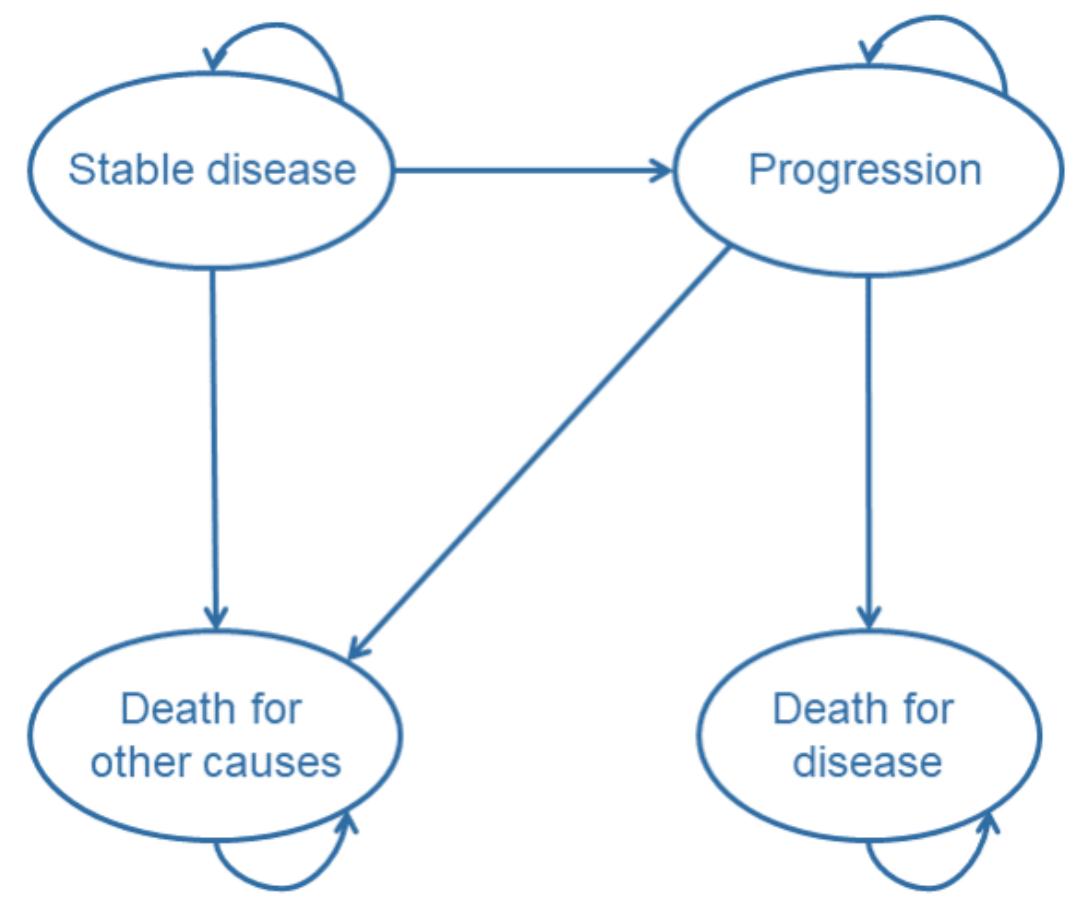
Liver-directed selective internal radiation therapy (SIRT) is a new device technology consisting in an infusion of radioactive microspheres, loaded with yttrium-90 (Y90). The microspheres are delivered directly to liver tumor through the hepatic artery. Recent retrospective studies have shown that a **personalized and optimised dosimetric approach**, which takes into account the dose absorbed by the tumour, is technically possible and **could lead to higher response rates** (Garin 2012, Garin 2015). The aim of the study was to perform a Cost-Effectiveness Analysis (CEA) comparing personalised dosimetry with standard dosimetry in the context of selective internal radiation therapy (SIRT) for the management of adult patients with locally advanced hepatocellular carcinoma (HCC) from the Italian Healthcare Service perspective.

METHODS

- A **partition survival model** has been developed to estimate costs and quality-adjusted life years (QALYs) over a lifetime horizon.
- Clinical inputs** were retrieved from a published randomized controlled trial (Garin 2021).
- Health resource utilization** was derived through the administration of questionnaires to clinicians in three oncology centres geographically distributed in Italy that perform a high volume SIRT procedures annually. The model considers healthcare services used in the peri-procedural period and in the follow-up. Cost parameters were based on Italian official tariffs.
- Deterministic and probabilistic sensitivity analyses** (PSA) were performed to test the robustness of the model.

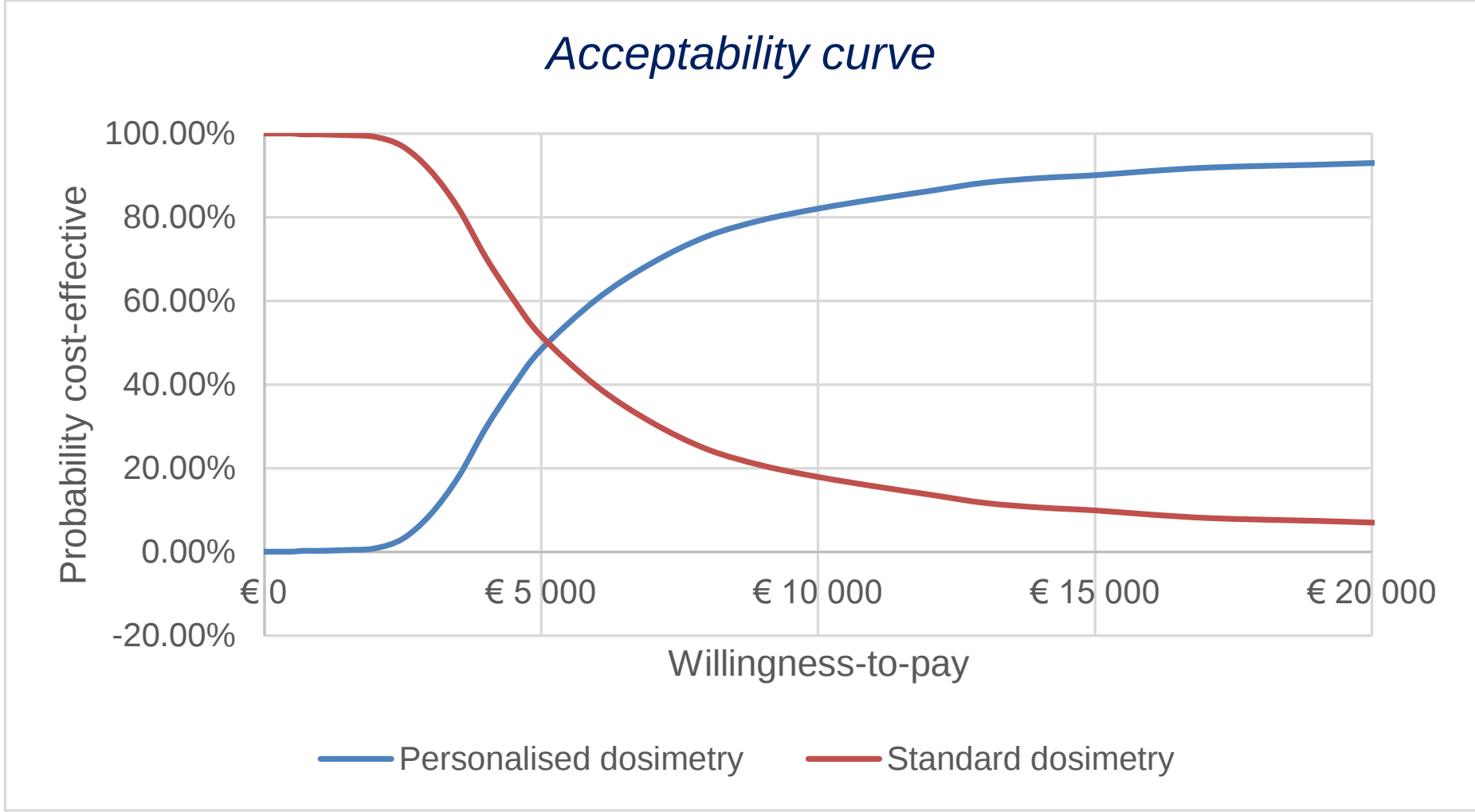
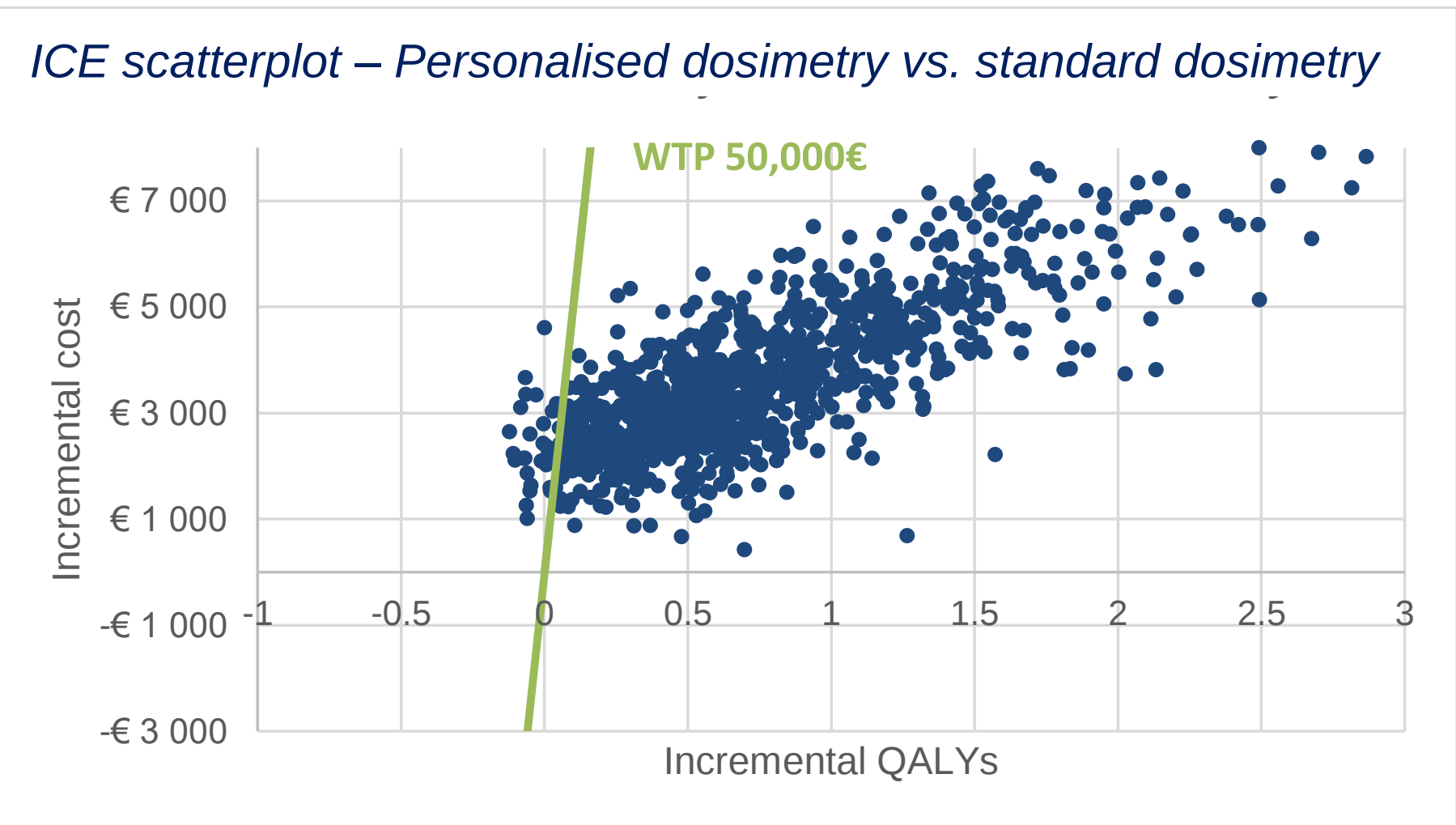
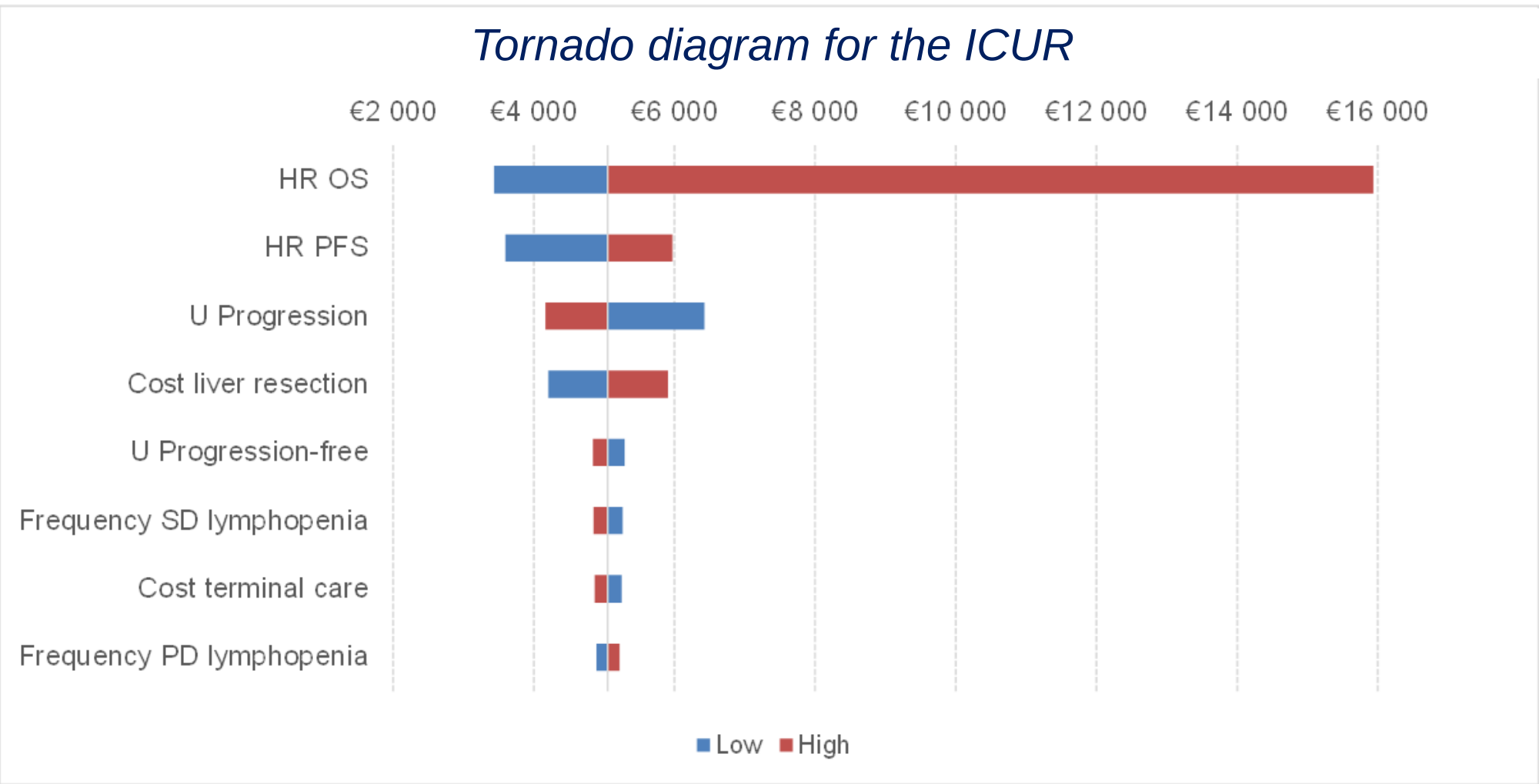
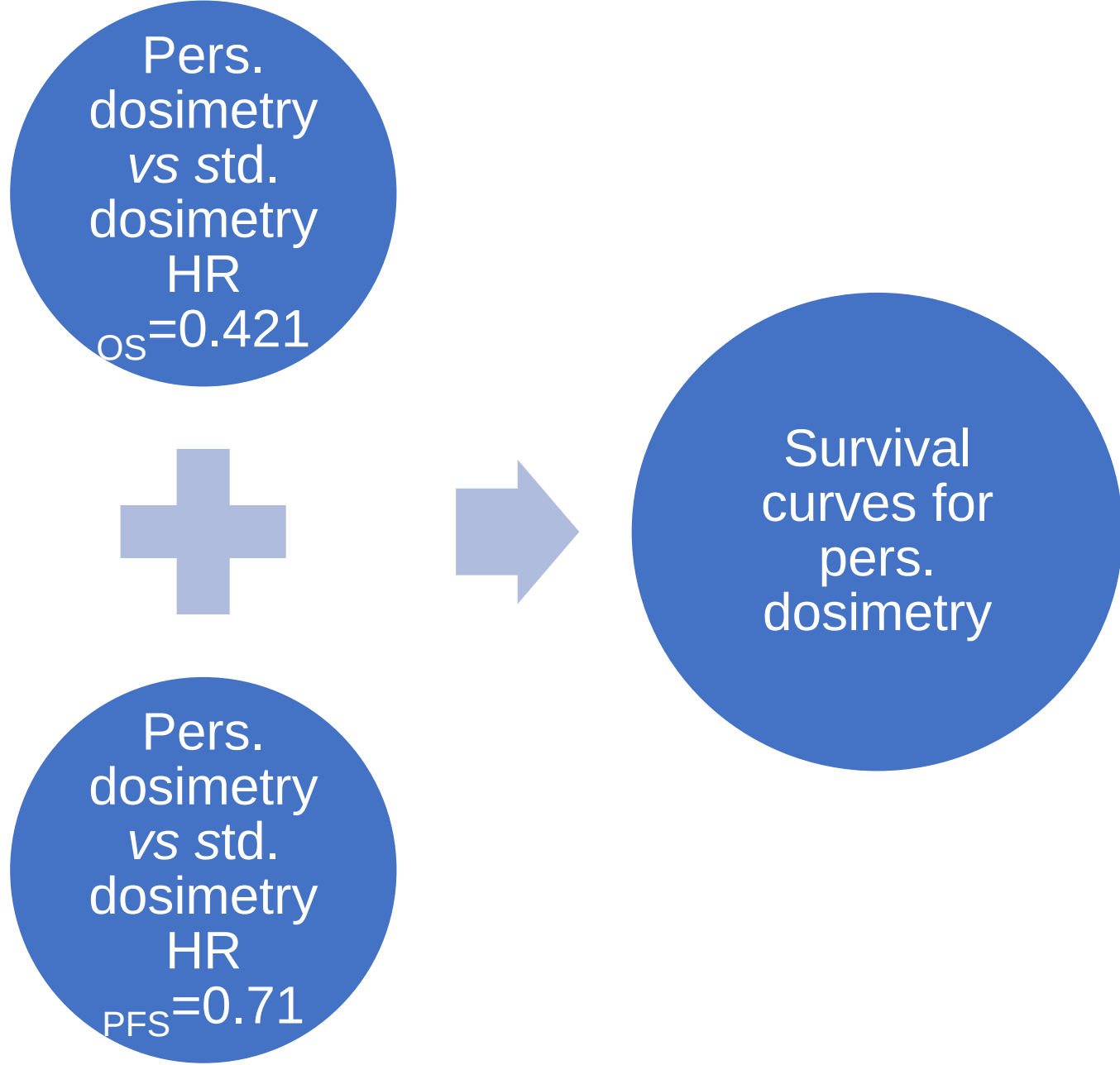


Representation of the implemented model



RESULTS

- Over a lifetime horizon, the model estimated average QALYs of 1.292 and 0.578 for patients undergoing personalised and standard dosimetry approaches, respectively
- The estimated mean costs per patient were 23,487 € and 19,877 €, respectively
- The **incremental cost-utility ratio (ICUR)** of personalised vs. standard dosimetry approach was **5,056 €/QALY**
- The most impactful parameters reporting greater variations on the ICUR were the hazard ratios for OS and PFS (personalised dosimetry vs standard dosimetry)
- In the PSA nearly all the simulations (96.7%) showed the cost-effectiveness of personalised dosimetry considering a willingness-to-pay threshold of 50,000€/QALY



CONCLUSIONS

Personalised dosimetry may be considered a cost-effective option compared to standard dosimetry for patients undergoing SIRT for HCC in Italy. These findings provide evidence for clinicians and payers on the value of personalised dosimetry as a treatment option for patients with HCC.

References

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