

Cost-Effectiveness and Budget Impact Analysis of Selective Internal Radiation Therapy versus Atezolizumab plus Bevacizumab from a German Statutory Health Insurance Perspective

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OBJECTIVES

- Non-metastasized, non-resectable hepatocellular carcinoma (HCC) in patients with Barcelona clinic liver cancer (BCLC) stages B and, in part, C (≈25%) can be treated by systemic immunotherapy or selective internal radiation therapy (SIRT).
- Therapies vary in terms of required infrastructure, medical specialization(s), facilities, preparation, conduct, and cost.
- Our objective was to undertake a cost-effectiveness analysis (CEA) and budget impact analysis (BIA) of SIRT – here: with 90Y-labelled glass microspheres (TheraSphere®) compared to immunotherapy with atezolizumab plus bevacizumab (A+B) – from the perspective of the German statutory health insurance (SHI).

METHODS

- A CEA and BIA model was developed in MS Excel. Clinical and cost inputs were sourced from published literature and official databases.
- The available key studies (IMbrave150 [1] resp. DOSISPHERE-01 [2]) suggest that both strategies are potentially comparable in terms of progression-free survival (PFS) and overall survival (OS) in HCC (Figure 1).
- In contrast, a difference in serious adverse events (SAEs) in favor of SIRT was observed (Figure 2).
- Accordingly, the CEA model investigates the endpoint “cost per SAE avoided”, and the BIA estimates the impact of shifting current market share to the more cost-effective option.
- The model takes into account the therapy costs of SIRT and A+B and the costs of adverse events related to these therapies. Costs of follow-up therapies and of ongoing screening were not considered as these are assumed to be comparable for both alternatives.
- The annual therapy costs of A+B are based on the official reimbursement tariffs (from a SHI perspective) sourced from the official German drug compendium [3], assuming a therapy duration of 6.8 months in line with the median PFS.
- The annual therapy costs of SIRT are based on the related DRG (H29Z) and ZE (ZE2021-65) reimbursement fees [4], allowing for potential additional costs for the workup and also for potential repeat procedures in a conservative maximum cost scenario.
- The information on adverse event rates is based on the IMbrave150 (A+B) [1] and DOSISPHERE (SIRT) [2] studies, and the related costs are based on a specific health-care resource use by adverse event grade matrix, validated by expert opinion, and subsequently monetarized by official German cost references [5-7].

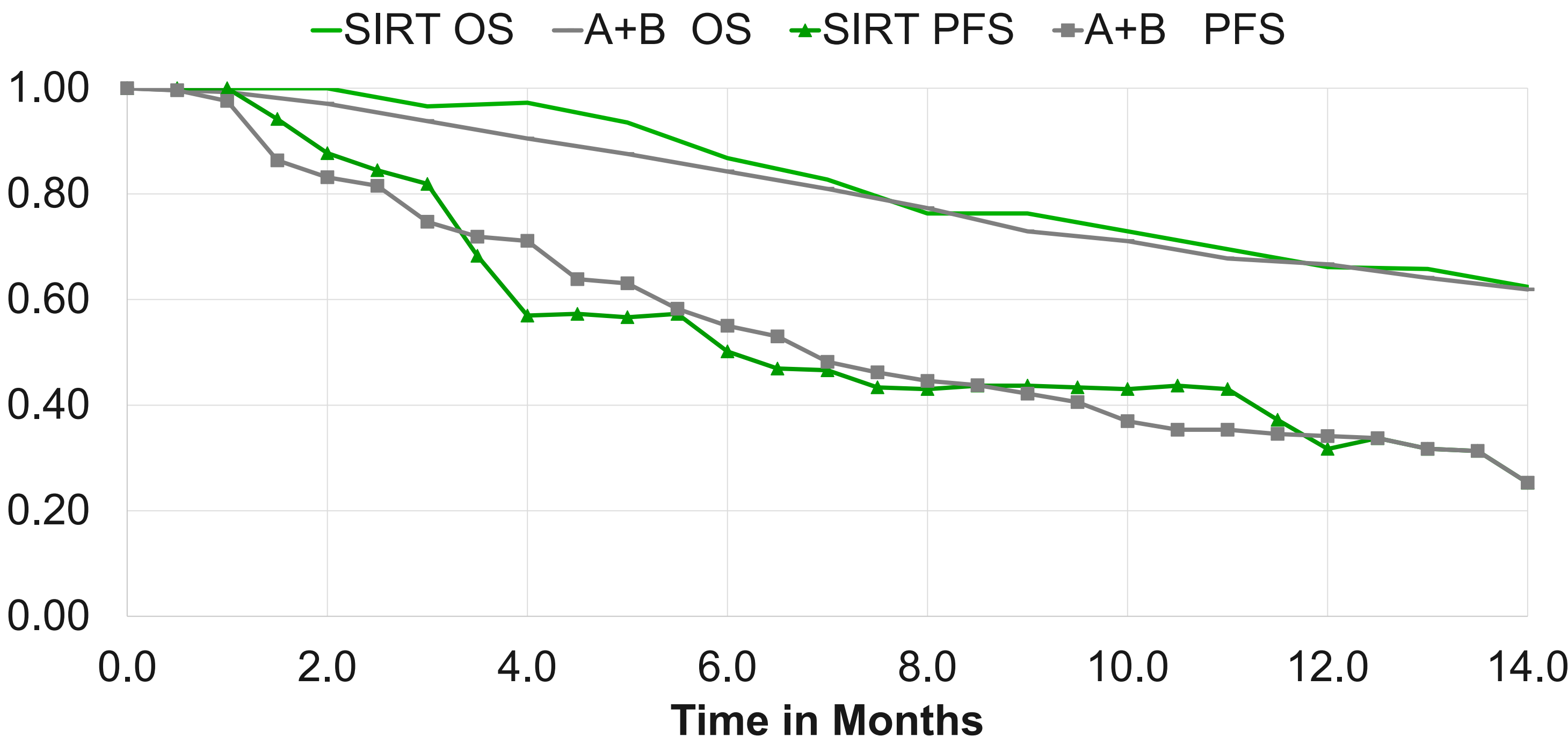


Figure 1: Kaplan-Meier Survival Curves: SIRT and A+B show comparable OS and PFS

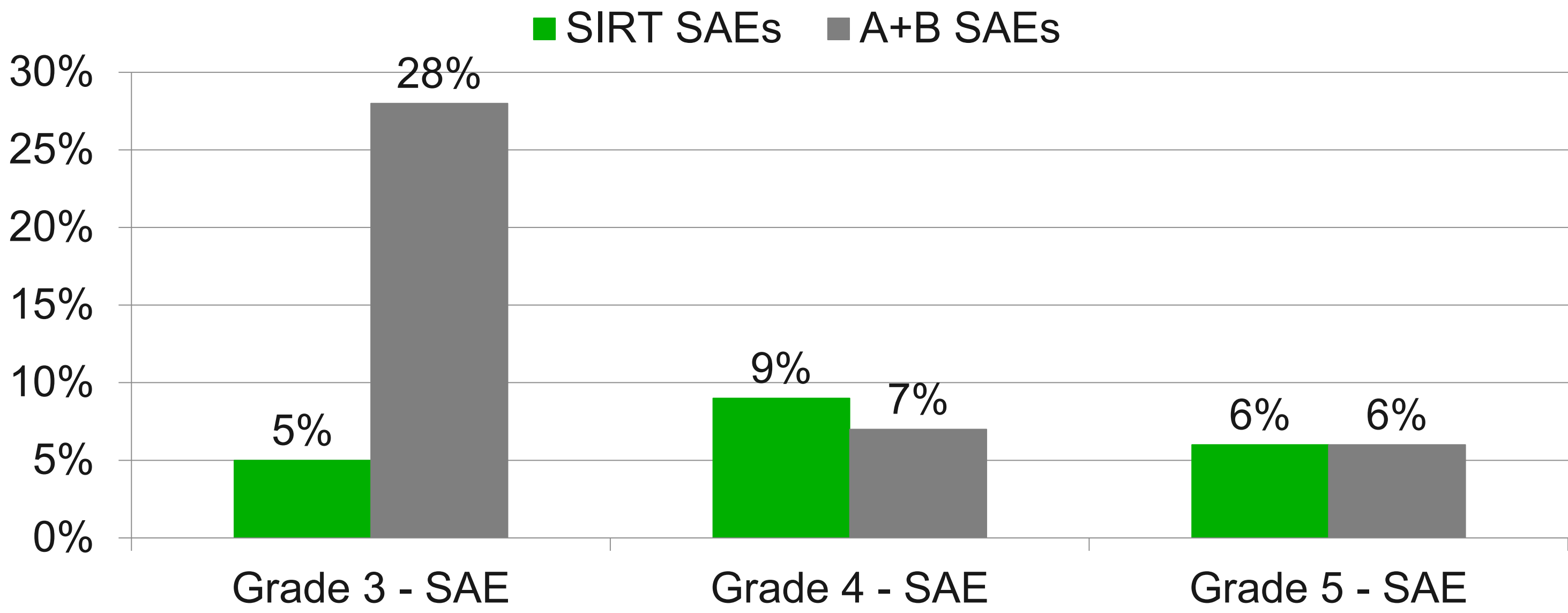


Figure 2: Serious Adverse Events (SAEs) by Grade: SIRT shows fewer SAEs compared to A+B

RESULTS

- The model computed mean annual total per-patient costs of €24,578 undergoing SIRT compared to €86,832 for A+B (Table 1).
- As SIRT featured a lower number of serious adverse events compared to A+B, it was the dominant strategy (Figure 3).
- The market share of SIRT in eligible HCC patients is currently about 25% (n≈500 procedures/year) in Germany [8].
- Switching another 25% of eligible patients from systemic therapy to SIRT could hence generate annual savings of ≈€30.7 million to the SHI system (Figure 4).
- The results were robust in sensitivity and scenario analyses.

Table 1. Costs per Patient per Year

Costs	A+B	SIRT	Incremental
Therapy Costs	84,444 €	23,001 €	-61,443 €
Total Adverse Event Costs	2,388 €	1,577 €	-811 €
Total Costs	86,832 €	24,578 €	-62,254 €
Efficacy	A+B	SIRT	Incremental
SAEs (SAEs avoided)	0.410	0.200	(0.210)
Cost-Effectiveness	211,786 €	122,890 €	-296,449 €

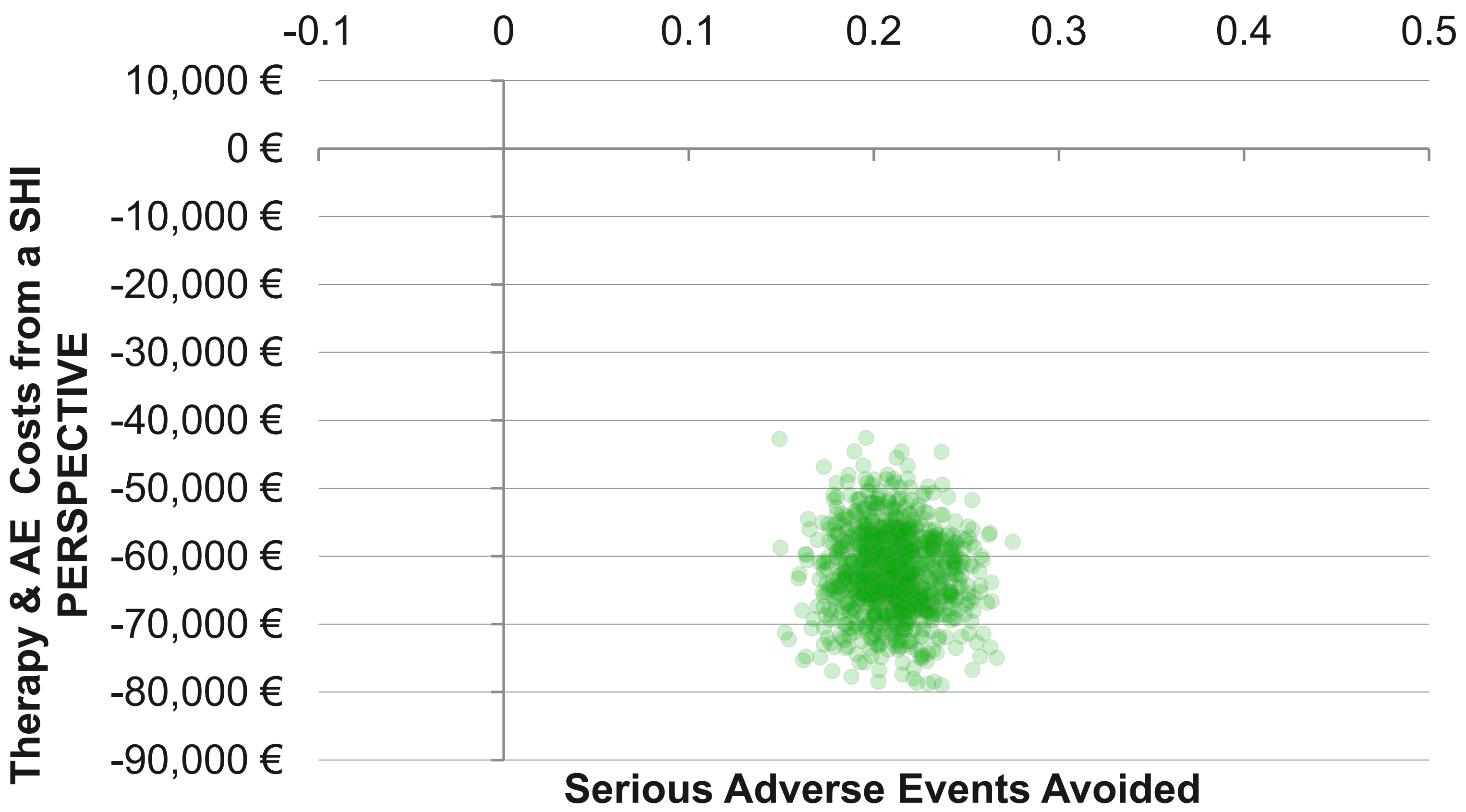


Figure 3: ICER Scatterplot - Cost per SAE avoided comparing A+B versus SIRT

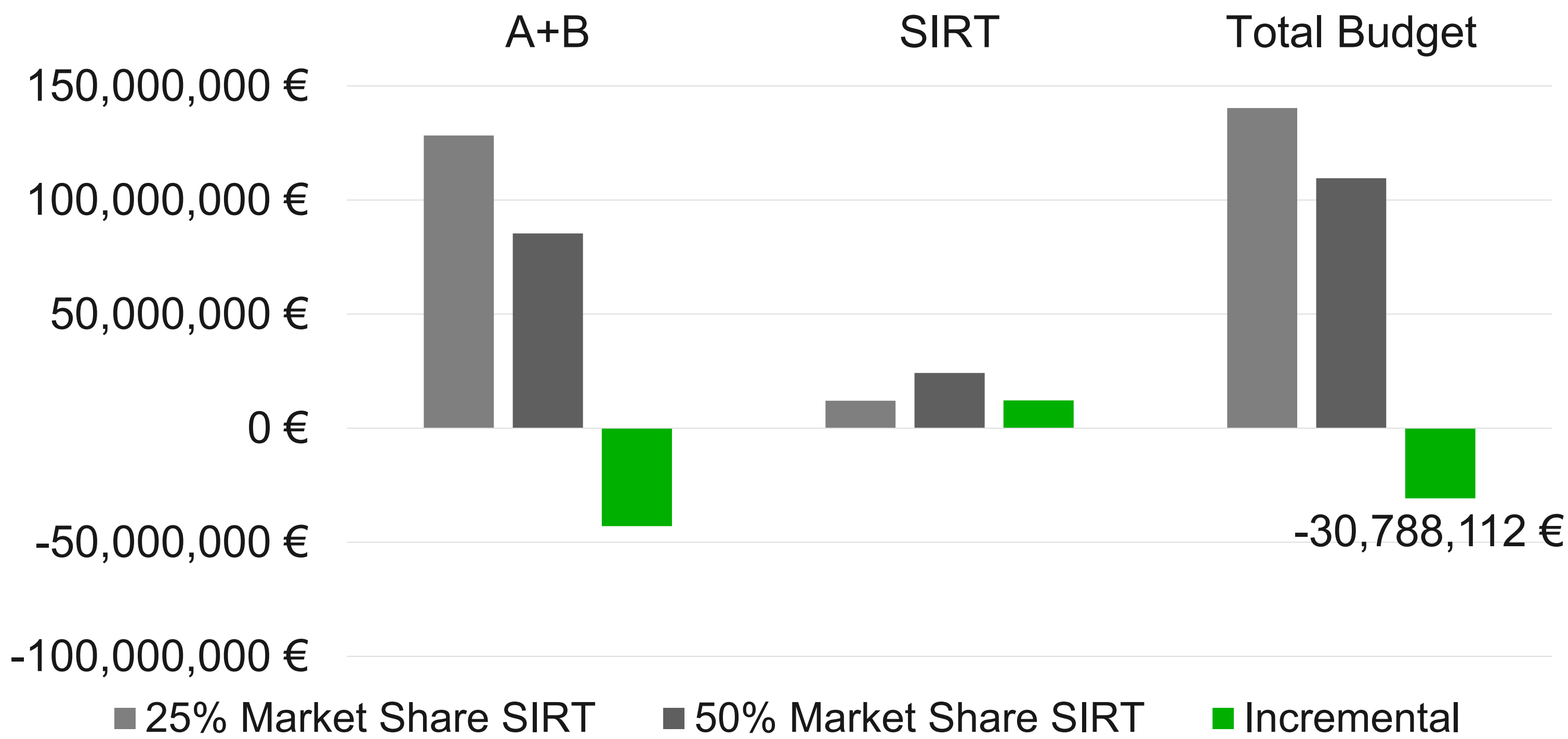


Figure 4: Budget impact of a additional market share shift of 25% from A+B to SIRT

CONCLUSIONS

Comparing systemic immunotherapy and personalized radioembolization in the indicated HCC target group, SIRT appears to be the dominating strategy with the potential to generate cost-savings from a German statutory health insurance perspective.

References

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