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Radiofrequency Renal Denervation for Uncontrolled Hypertension:
A cost-effectiveness analysis for the Belgian setting based on
SPYRAL HTN-ON MED and other contemporary evidence

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Objectives

- Radiofrequency renal denervation (RF RDN) is a therapeutic option for uncontrolled, including resistant, hypertension. ^{1,2}
- This study examined the cost-effectiveness of RF RDN from the perspective of the Belgian healthcare payer.

Methods

- A decision-analytic Markov model projected clinical events, quality-adjusted survival and costs with a time horizon of ten years and lifetime. ³
- Clinical events projected included stroke, myocardial infarction (MI), angina pectoris/coronary heart disease (AP/CHD), heart failure (HF), end-stage renal disease (ESRD), cardiovascular death (CVD), and all-cause death (ACD).
- The model was based on multivariate risk equations, including the Framingham equations.
- Clinical event risk reductions associated with changes in office systolic blood pressure (oSBP) were estimated based on a meta-regression of 47 hypertension treatment-related randomized controlled trials (RCTs).⁴
- Disease state costs were sourced from published literature and fee schedules; a cost of €8491 was assumed for RF RDN.
- Demographics and treatment effects (-4.9 mmHg, active vs sham oSBP,) were derived from the SPYRAL HTN-ON MED trial. ⁵
- The analysis was conducted from the perspective of the Belgian healthcare payer, including associated healthcare costs, with a 3.0% discount rate for costs and a 1.5% discount rate for health effects as per Belgian guidelines. ⁶
- Ten-year clinical event relative risks (RR) and the lifetime incremental cost-effectiveness ratio (ICER) were calculated.
- The ICER was evaluated against a willingness-to-pay (WTP) threshold of €40,000 per quality-adjusted life year (QALY) gained, and extensive deterministic and probabilistic sensitivity analyses performed.

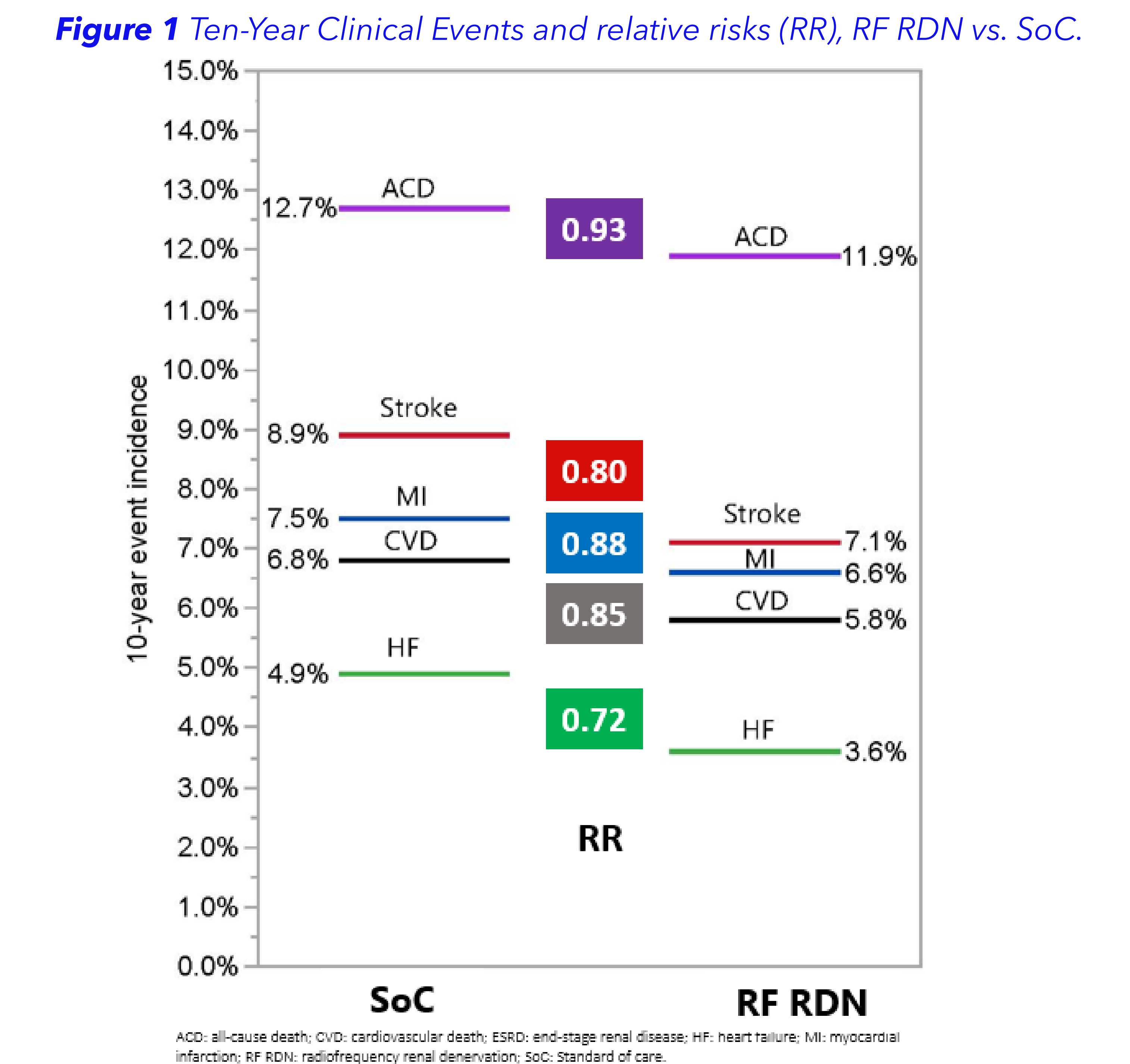
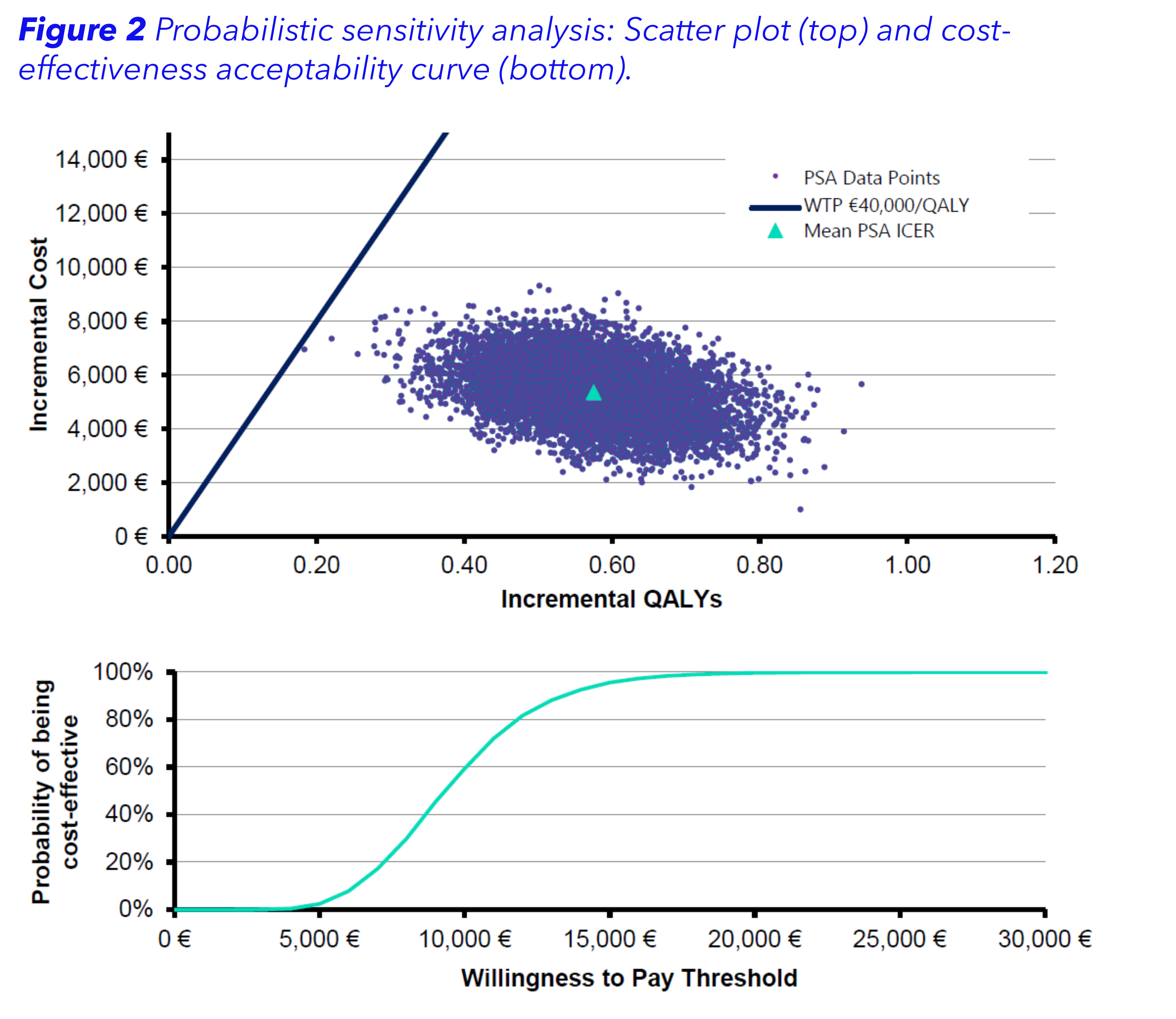


Table 1 Cost-effectiveness results for the base case.

	Cost	ΔCost	QALYs	ΔQALYs	ICER
RF RDN	€47,366	€5,386	17.45	0.57	€9,381
SoC	€41,980		16.88		

Results

- RF RDN led to a significant clinical event RR (0.80 for stroke, 0.88 for MI, 0.89 for AP/CHD, 0.72 for HF, 0.96 for ESRD, 0.85 for CVD, and 0.93 for ACD, see Fig. 1).
- Compared to sham therapy, RF RDN led to an incremental QALY gain of 0.57 at an incremental cost of €5,386, yielding an ICER of €9,381 per QALY gained (Table 1), substantially below WTP thresholds referenced for Belgium.
- In deterministic sensitivity analysis, the cost and effect size of RF RDN were the most influential parameters, followed by stroke costs and utility. ICERs remained under €14,000 per QALY across tested scenarios.
- Results were shown to be robust in probabilistic sensitivity analysis, demonstrating a high probability of being cost-effective across a wide range of WTP (Figure 2).



Conclusions

Based on model-based projections, RF RDN is expected to lead to meaningful clinical event risk reductions and can provide a cost-effective treatment alternative for uncontrolled hypertension in the Belgian setting.

References:

1 McEvoy et al. Eur Heart J. 2024.
2 Mancía et al. J Hyperten. 2023.
3 Sharp et al. EHJ-QCCO. 2024.
4 Thomopoulos et al. J Hypertens. 2014.
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