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Cost-utility Analysis of Left Atrial Appendage Occlusion versus Anticoagulant Therapy for Atrial Fibrillation Patients at High Risk of Stroke and Major Bleeding in Thailand

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Purpose

Left atrial appendage occlusion (LAAO) is an alternative strategy for patients with non-valvular atrial fibrillation (NVAF) who are at elevated risk of major bleeding^{1,2}. This study aimed to evaluate the cost-utility of LAAO compared with anticoagulant therapy in patients with NVAF at high risk of stroke and major bleeding in Thailand.

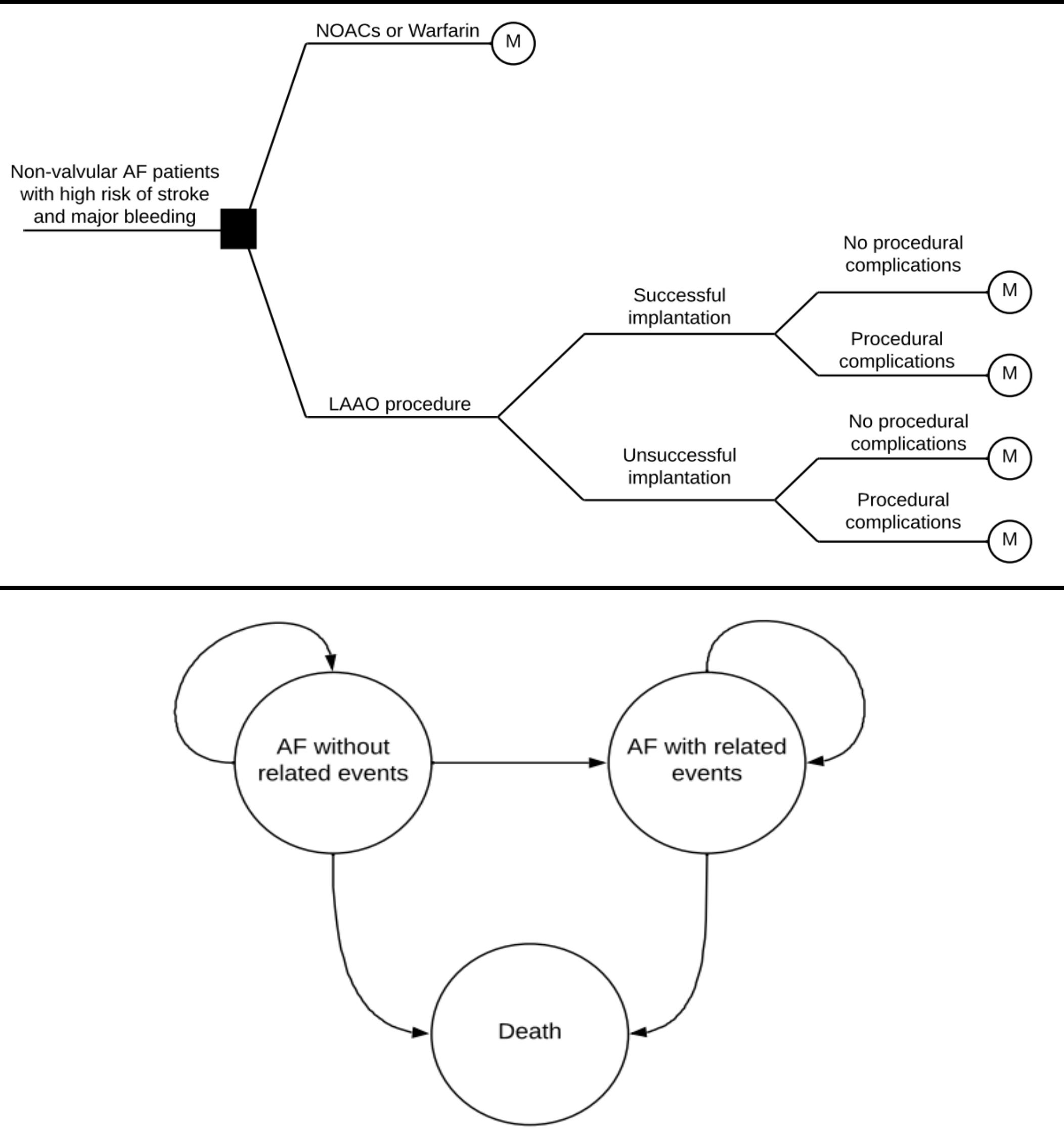


Figure 1: two-part decision analytical model

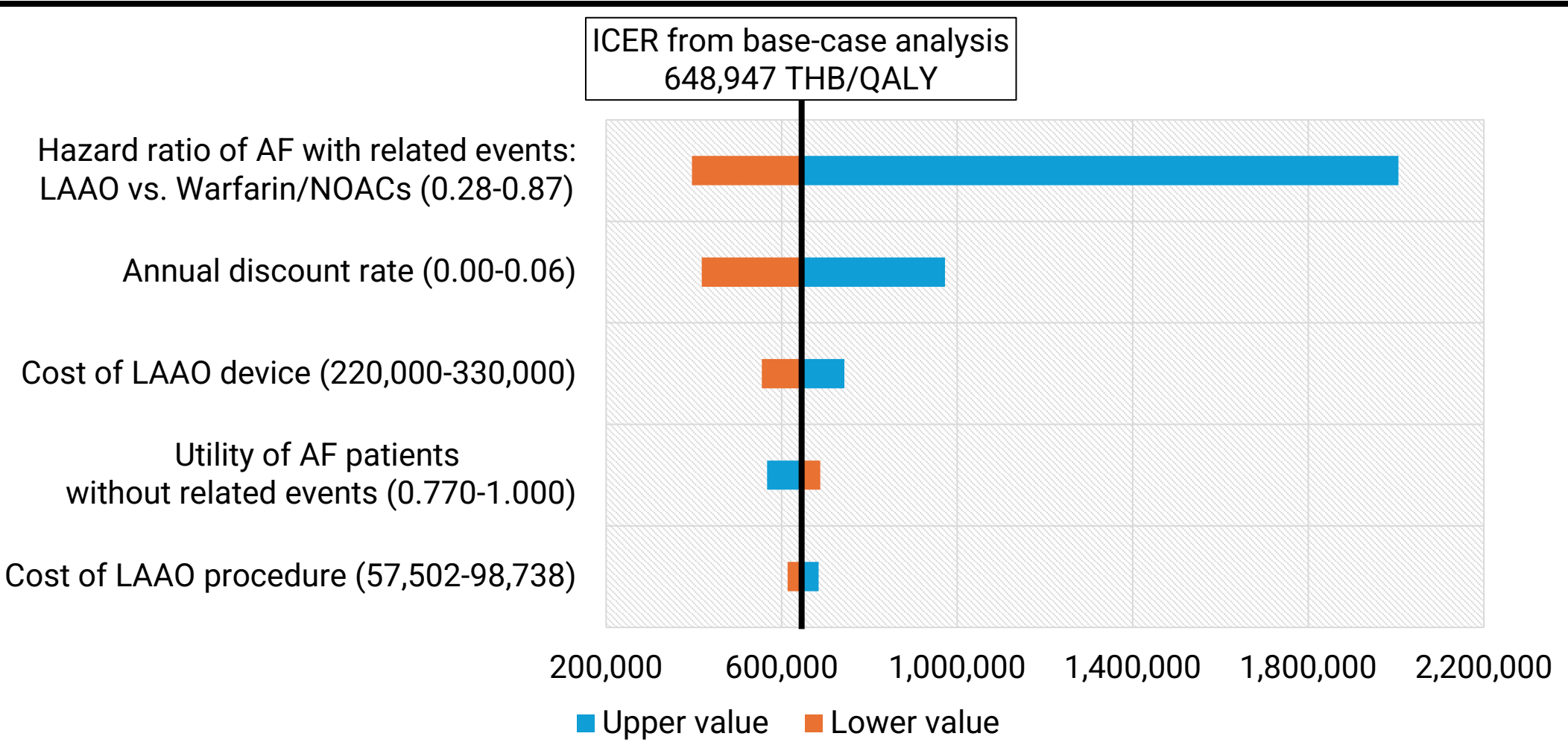


Figure 2: Tornado diagram

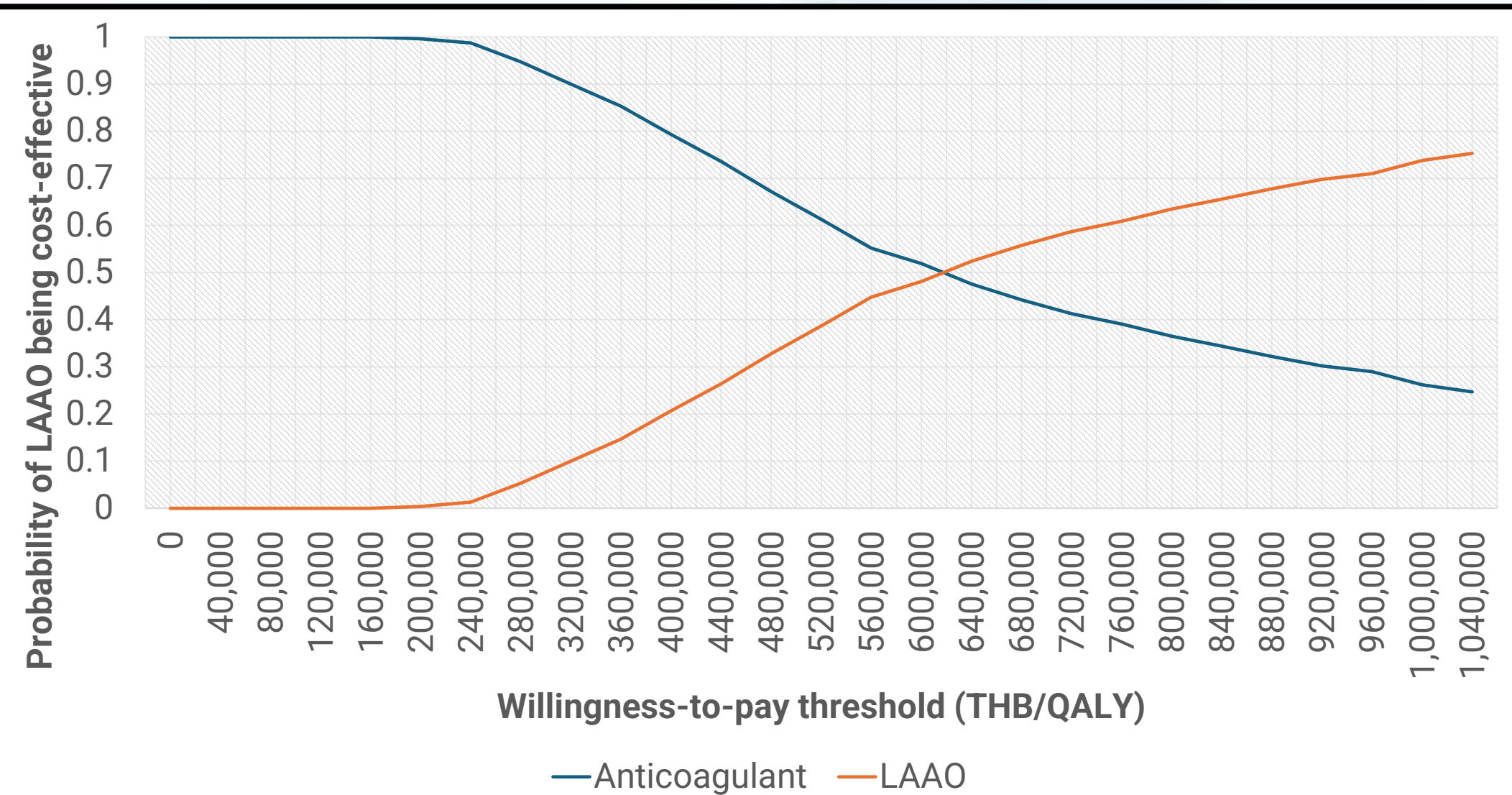


Figure 3: Cost-effectiveness acceptability curve

Methods

- A two-part decision-analytic model was constructed to estimate lifetime costs, life years (LYs), and quality-adjusted life years (QALYs) from a societal perspective (Figure 1).
- The study population consisted of patients with NVAF who had high stroke risk (CHA₂DS₂-VASc score ≥ 2 for men and ≥ 3 for women) and high risk of major bleeding (HAS-BLED score ≥ 3).
- Patient-level data on the effectiveness of LAAO, mortality, complications, costs, and utilities for this particular population were obtained from three largest university-affiliated hospitals.
- Costs and outcomes were expressed in 2025 values and discounted at 3% annually.
- Incremental cost-effectiveness ratio (ICER) was calculated as incremental costs per QALY gained.
- Deterministic and probabilistic sensitivity analyses were performed to assess model uncertainty.

Results

Societal perspective	Total Cost, THB (USD)	QALYs
LAAO treatment	2,033,062 (61,523)	10.60
Anticoagulant therapy	1,653,903 (50,050)	10.02
Incremental cost-effectiveness ratio, THB/QALY (USD/QALY)	648,947 (19,638)	

Base-case results:

- LAAO incurred higher lifetime costs than anticoagulant therapy (THB 2,033,062 [USD 61,523] vs THB 1,653,903 [USD 50,050]) but provided greater benefits (13.02 vs 12.51 LYs; 10.60 vs 10.02 QALYs).
- The ICER was THB 648,947 (USD 19,638) per QALY gained.

Key sensitivity findings:

- Results were most sensitive to the hazard ratio for AF-related events, discount rate, and cost of LAAO device (Figure 2).
- Probabilistic analysis indicated that LAAO was not cost-effective at current price (Figure 3).

Conclusion

Under the Thai willingness-to-pay threshold of THB 160,000 per QALY (USD 4,842), LAAO is unlikely to represent a cost-effective strategy compared with anticoagulant therapy among NVAF patients at high risk of stroke and major bleeding. However, LAAO provided additional health benefits and may become more economically attractive if device prices decline.

Acknowledgement

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References

1) Joglar JA, Chung MK, Armbruster AL, Benjamin EJ, Chyou JY, Cronin EM, et al. 2023 ACC/AHA/ACCP/HRS Guideline for the Diagnosis and Management of Atrial Fibrillation: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. Circulation. 2024;149(1):e1-e156.
2) Hindricks G, Potpara T, Dagres N, Arbelo E, Bax JJ, Blomström-Lundqvist C, et al. 2020 ESC Guidelines for the diagnosis and management of atrial fibrillation developed in collaboration with the European Association for Cardio-Thoracic Surgery (EACTS): The Task Force for the diagnosis and management of atrial fibrillation of the European Society of Cardiology (ESC) Developed with the special contribution of the European Heart Rhythm Association (EHRA) of the ESC. Eur Heart J. 2021;42(5):373-498.