

Cost-effectiveness of regular comprehensive eye examinations for a community dwelling older population: preliminary results

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BACKGROUND

- We face an **increasing burden of visual impairment (VI)** from age-related ocular disorders, which typically become clinically significant after age 50 years.
- Regular comprehensive eye examinations (CEEs) enable early detection and timely management of ocular disorders to prevent VI.
- Research Gap:**
 - No consensus on examination interval in clinical guidelines: varies from every 1-5 years for ages 50-64, and every 1-2 years for age ≥ 65 .
 - Limited economic evidence on optimal examination interval.

PURPOSE

To evaluate the cost-effectiveness of strategies with different intervals for regular CEEs for an older population from a societal perspective.

MODEL OVERVIEW

An **individual-based state-transition model** was developed to simulate the development and progression of **four common age-related ocular conditions**: uncorrected refractive error (URE), age-related macular degeneration (AMD), glaucoma, and cataracts.

Compared strategies: Eleven strategies combining different examination intervals for two age groups: 50-64 years (no examination, or every 1-5 years) and ≥ 65 years (every 1-2 years).

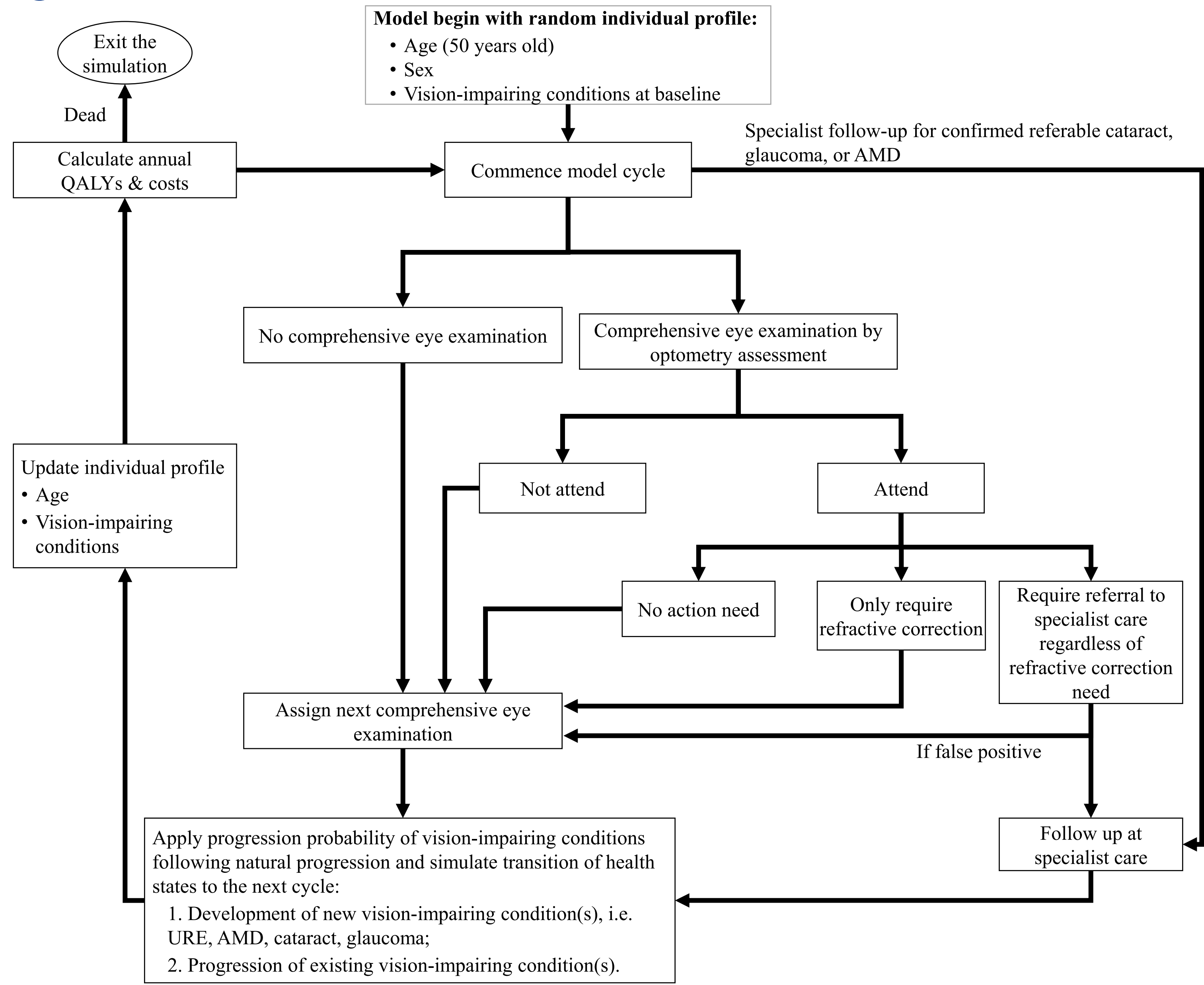
Simulated cohort: 1 million 50-year-old individuals in Hong Kong (HK).

Time horizon: Lifetime with 1-year cycle length.

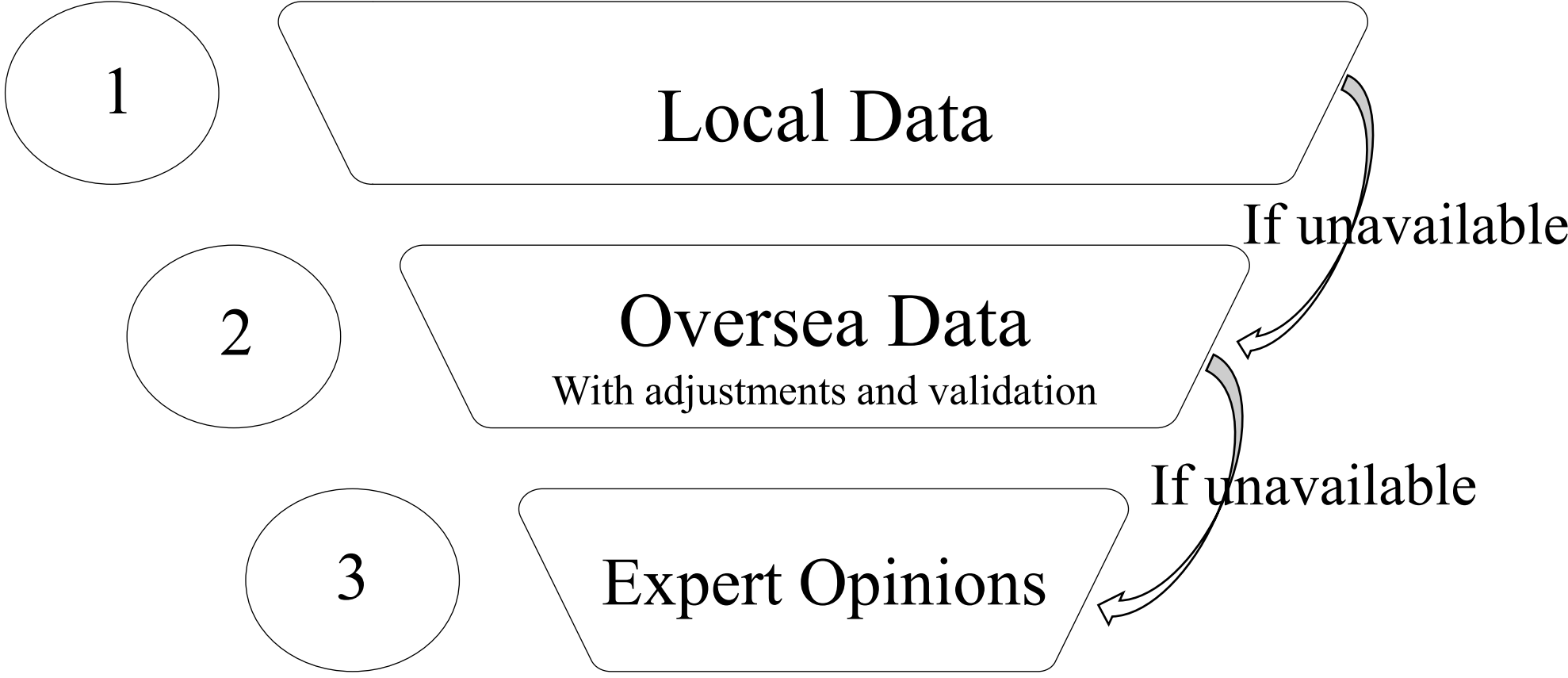
Outcomes include quality-adjusted life years (QALYs), costs, and incremental cost-effectiveness ratios (ICERs), evaluated from a societal perspective.

Discount rate: 3.5% on costs and QALYs.

Figure 1 Simulation flow of the model



Model Input



RESULTS

Table 1 Base-case cost-utility results for non-dominated strategies

Strategy: 50-64/ ≥ 65	QALYs	Incremental QALYs	Total cost (US\$)	Incremental cost (US\$)	ICER (US\$/QALY gained)
Strategy: No examination/2y	19.24	--	7,523	--	--
Strategy: 5y/2y	19.45	0.21	7,819	296	1,382
Strategy: 3y/2y	19.55	0.09	8,029	210	2,233
Strategy: 2y/2y	19.61	0.07	8,242	213	3,239
Strategy: 1y/1y	19.73	0.12	8,995	753	6,391

Figure 2 Tornado chart for one-way sensitivity analysis of annual vs. biennial comprehensive eye examination for all (Strategy 1y/1y vs Strategy 2y/2y)

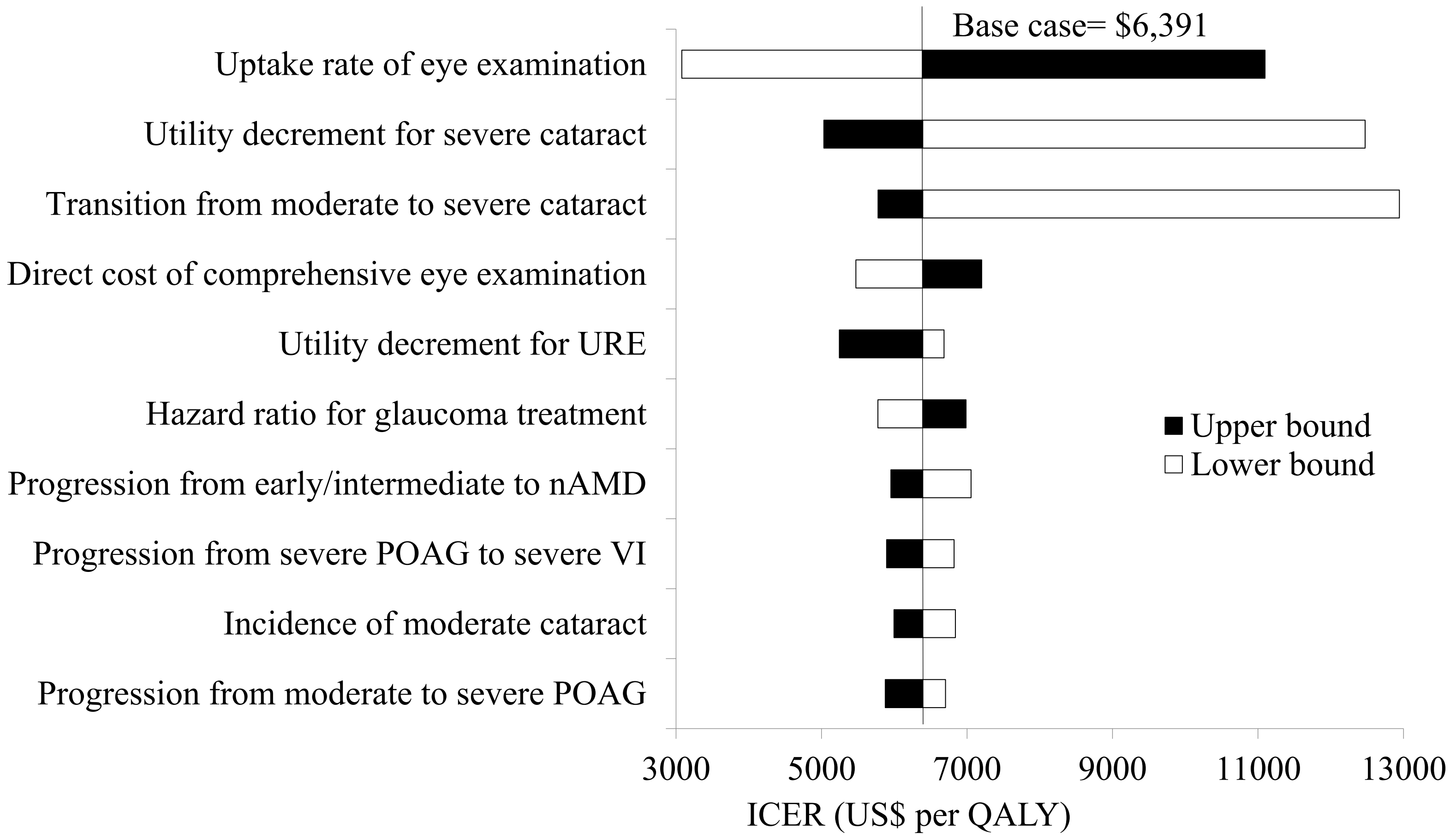
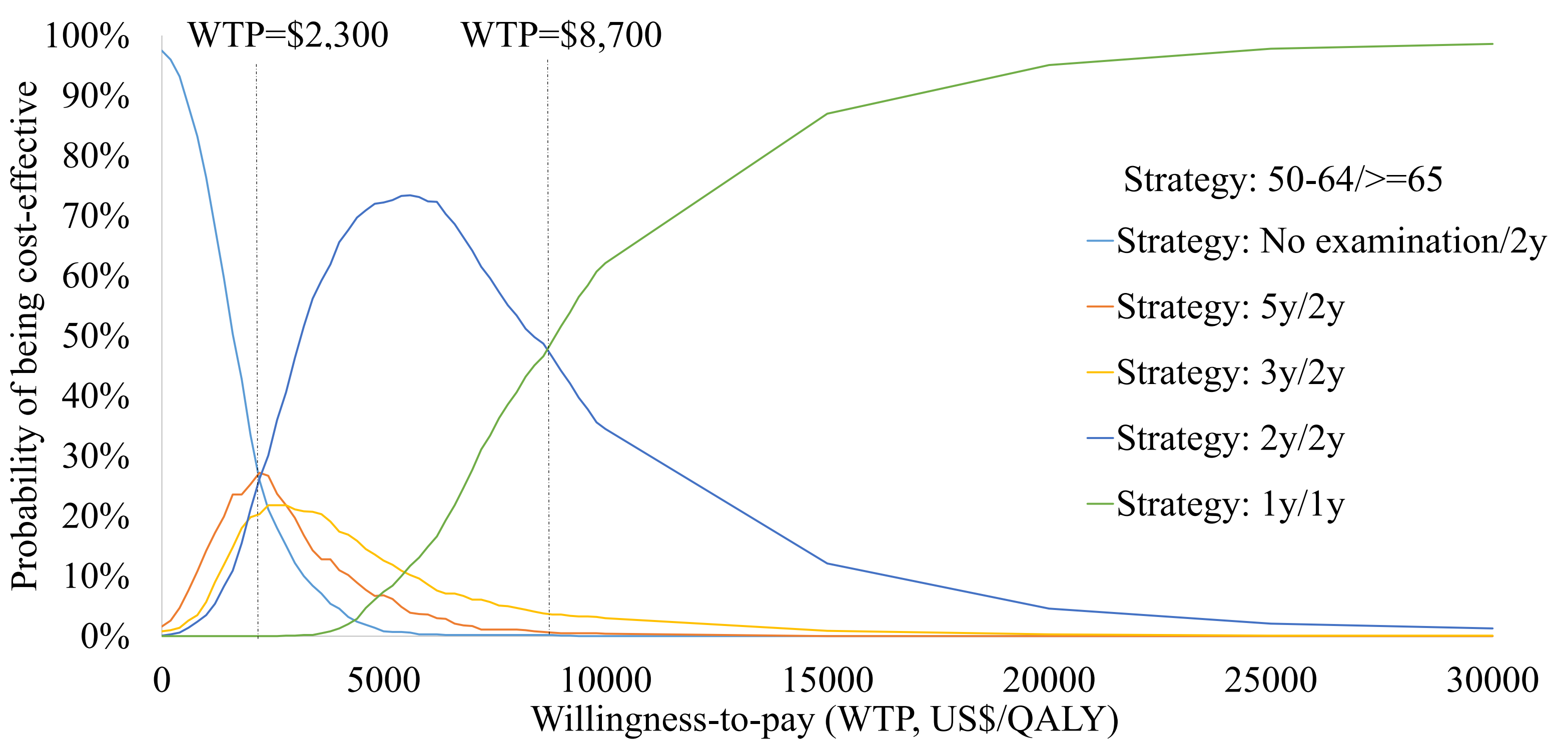


Figure 3 Cost-effectiveness acceptability curves of the non-dominated strategies



CONCLUSION

From a societal perspective, the cost-effective CEE intervals for individuals aged ≥ 50 years were 5y/2y, 3y/2y, 2y/2y, and 1y/1y. The annual interval for everyone (1y/1y) yielded the greatest QALY gains and was the optimal strategy at higher WTP thresholds. However, it incurred the highest societal costs and imposed the greatest demand on health system capacity. Biennial examinations (2y/2y) may offer a reasonable compromise under resource constraints.

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