






INTRODUCTION: Rheumatoid arthritis is a long-term autoimmune condition that mainly affects the joints, causing pain, swelling, stiffness, and reduced quality of life. Methotrexate is widely used as the first-line treatment, but some patients may not respond adequately to it. In such cases, biologic agents like tocilizumab are often considered to improve disease management. Since biologic therapies are more expensive, evaluating their cost-effectiveness is important for better healthcare decision-making

OBJECTIVE: Rheumatoid arthritis is a chronic autoimmune disease characterized by the progressive loss of function and a decreased quality of life. The objective of this study is to analyse the cost-effectiveness of the combination of Tocilizumab and Methotrexate (MTX), compared to Methotrexate alone. The study is conducted from healthcare payer's perspective

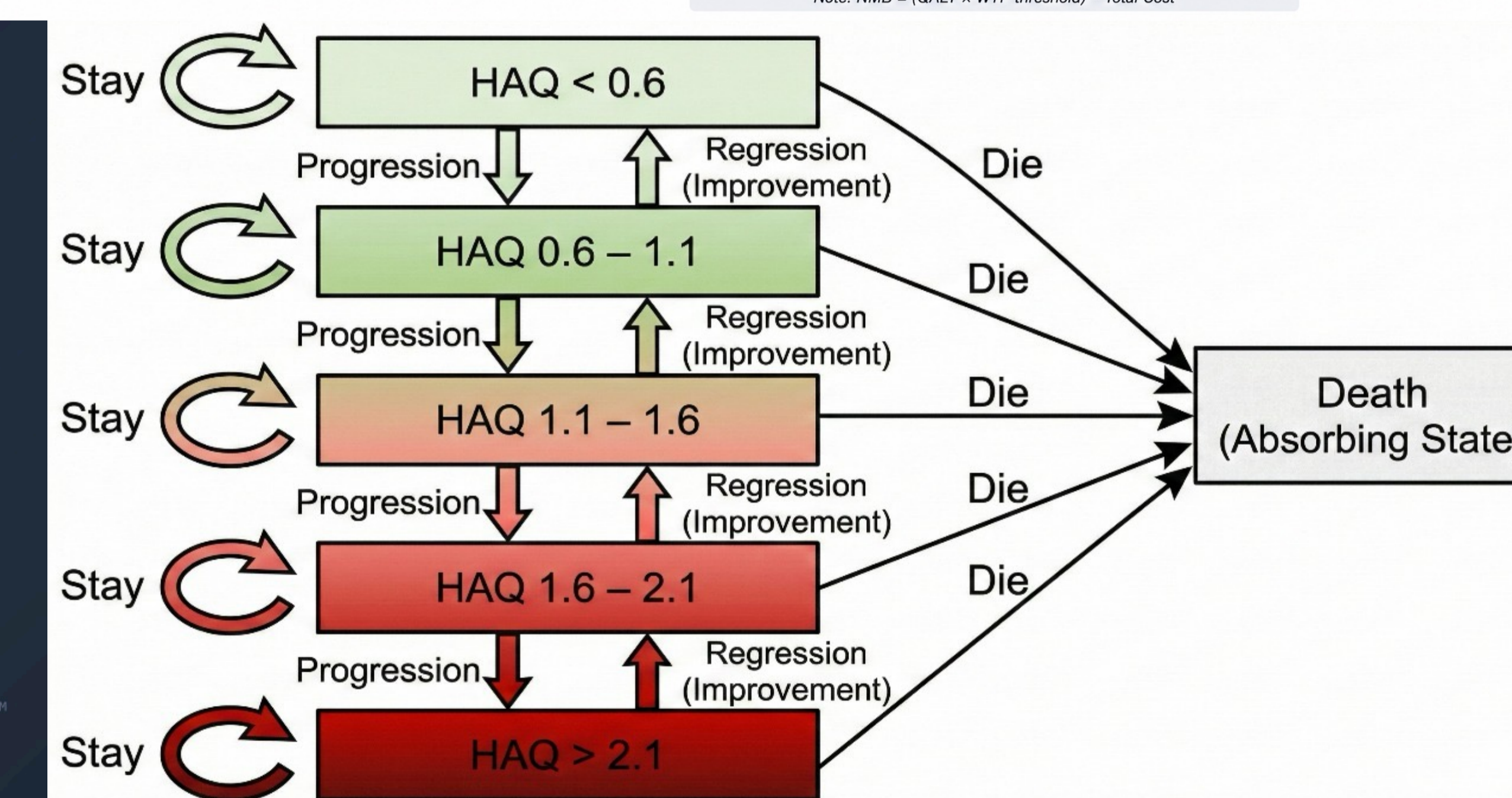
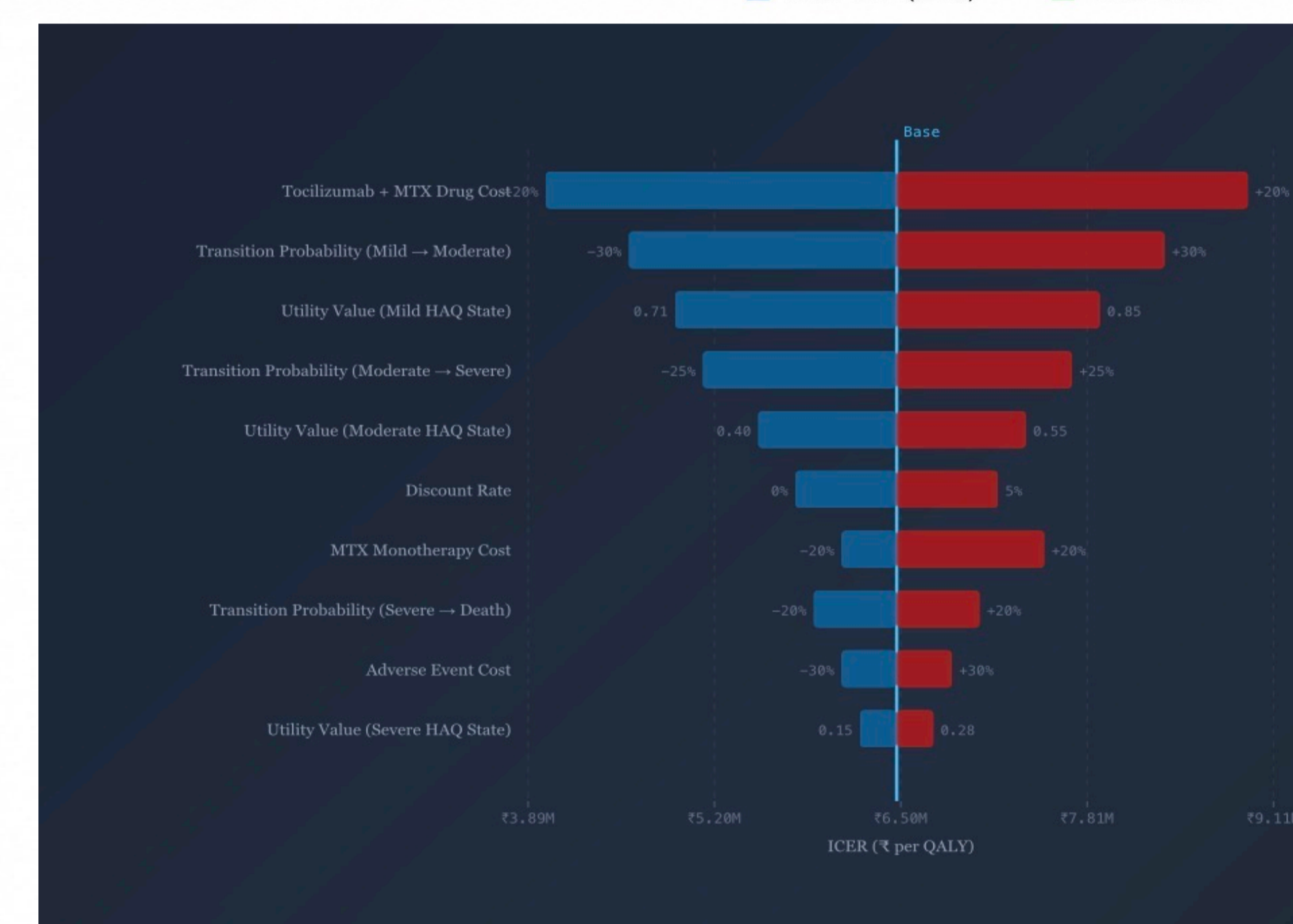
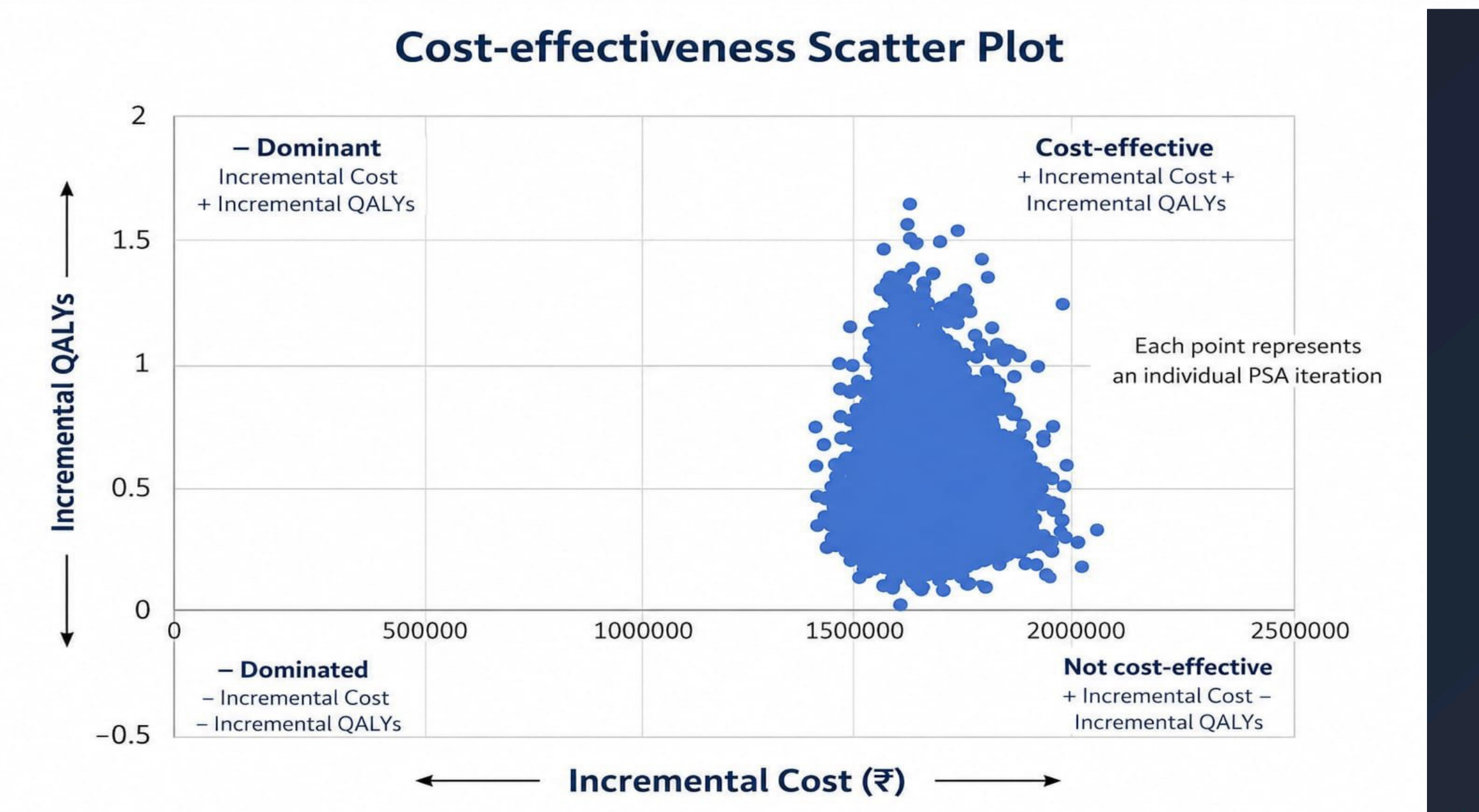
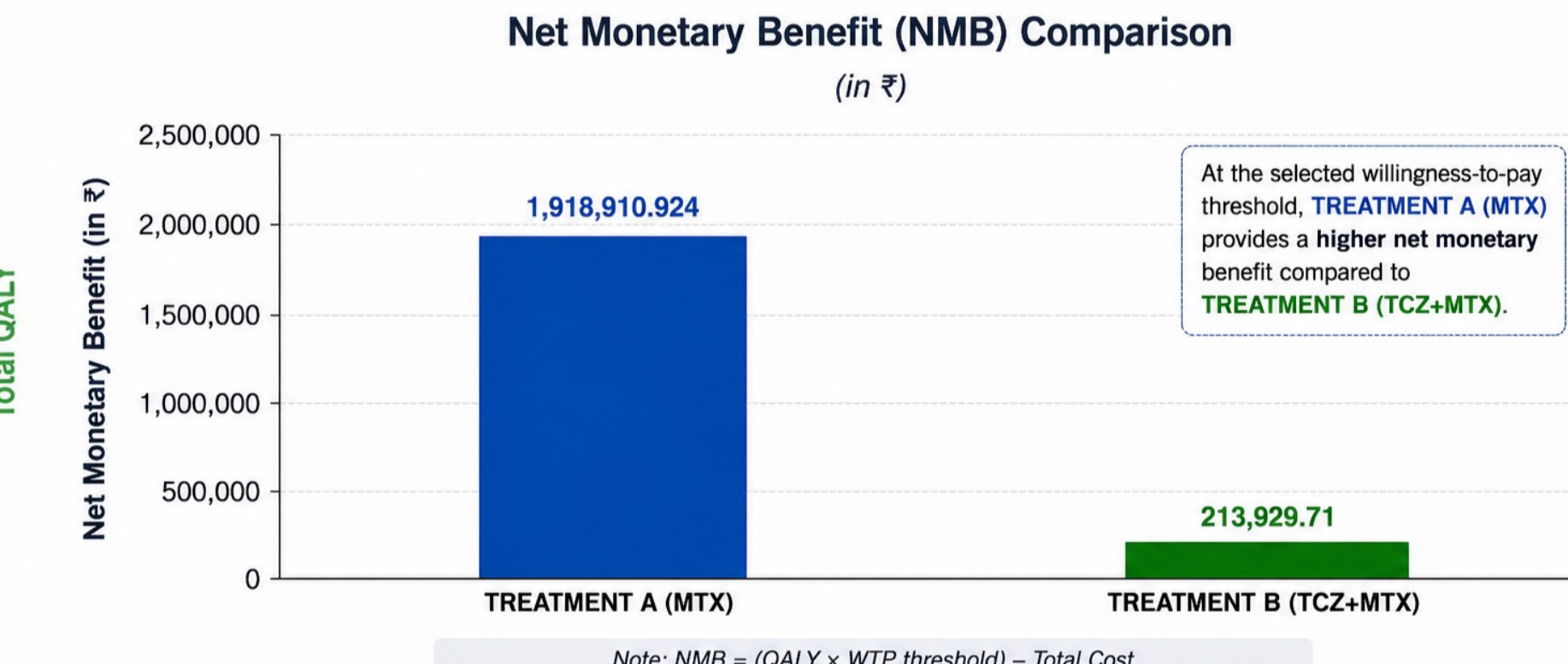
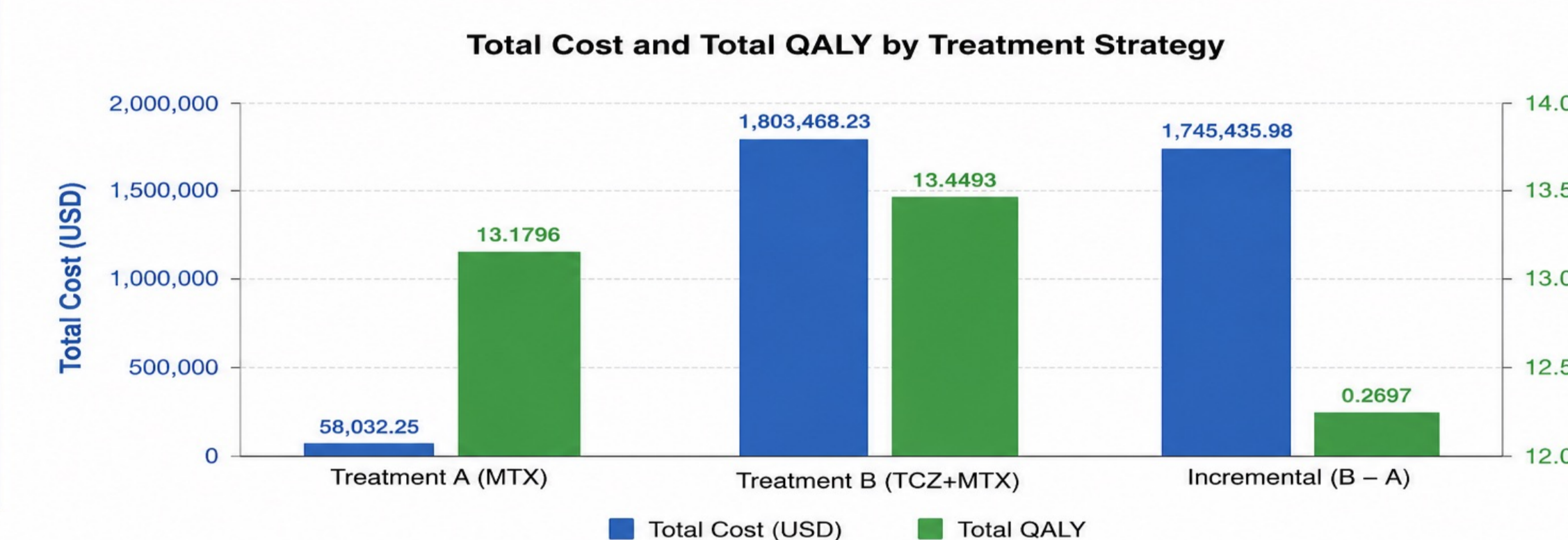
METHOD: An individual state transition simulation model using the Markov process was developed Markov model with 1 month cycles and a 2 year horizon to reflect disease development in RA patients. It includes five health states, with death as the absorbing state, and is divided by Health Assessment Questionnaire scores. Transition probabilities, treatment costs, and utility values were taken from the literature. Outcomes were measured by quality-adjusted life-years (QALYs), and the cost is presented in local currency units of India with discount rate of 3% annually. Probabilistic sensitivity analysis was used to examine the uncertainty of the parameters used in this cost-effectiveness analysis, and results were evaluated using the threshold of willingness to pay.

RESULT: MTX monotherapy (Treatment A) had an overall cost of 58,032 rupees and created an outcome of 13.18 QALYs. Tocilizumab and Methotrexate combined (Treatment B) had an overall cost of 18,03,468 rupees and an outcome of 13.45 QALYs. The incremental cost-effectiveness ratio (ICER) at this stage was 17,45,435.977 rupees per QALY, which reveals that while the regimen has additional benefits, the additional cost incurred is significantly high. Results were validated by the PSA.

MODEL STRUCTURE		
	Model Type	Individual state-transition simulation (Markov process)
	Health States	5 HAQ-based states + death (absorbing)
	Cycle Length	1 month
	Time Horizon	2 years
	Discount Rate	3% per annum

Strategy	Total Cost (USD)	Total QALY
Treatment A (MTX)	58,032.25469	13.17962119
Treatment B (TCZ+MTX)	1,803,468.232	13.44931961
Incremental (B - A)	1,745,435.977	0.269698418

Treatment Strategy	Net Monetary Benefit (NMB) (in ₹)
TREATMENT A (MTX)	1,918,910.924
TREATMENT B (TCZ+MTX)	213,929.71
INCREMENTAL (B - A)	-1,704,981.214



CONCLUSION: From the perspective of a healthcare payer, the improvement contributed by Tocilizumab, as an add-on treatment with Methotrexate, is relatively small compared to the outcome achieved by using only Methotrexate. This finding is significant from the perspective of making economic decisions, as it serves as an important point to which policymakers must give attention when making decisions concerning the treatment of RA.

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