

Markov Model - Based Cost - Utility Analysis Comparing Ranibizumab with Panretinal Photocoagulation for Proliferative Diabetic Retinopathy in India

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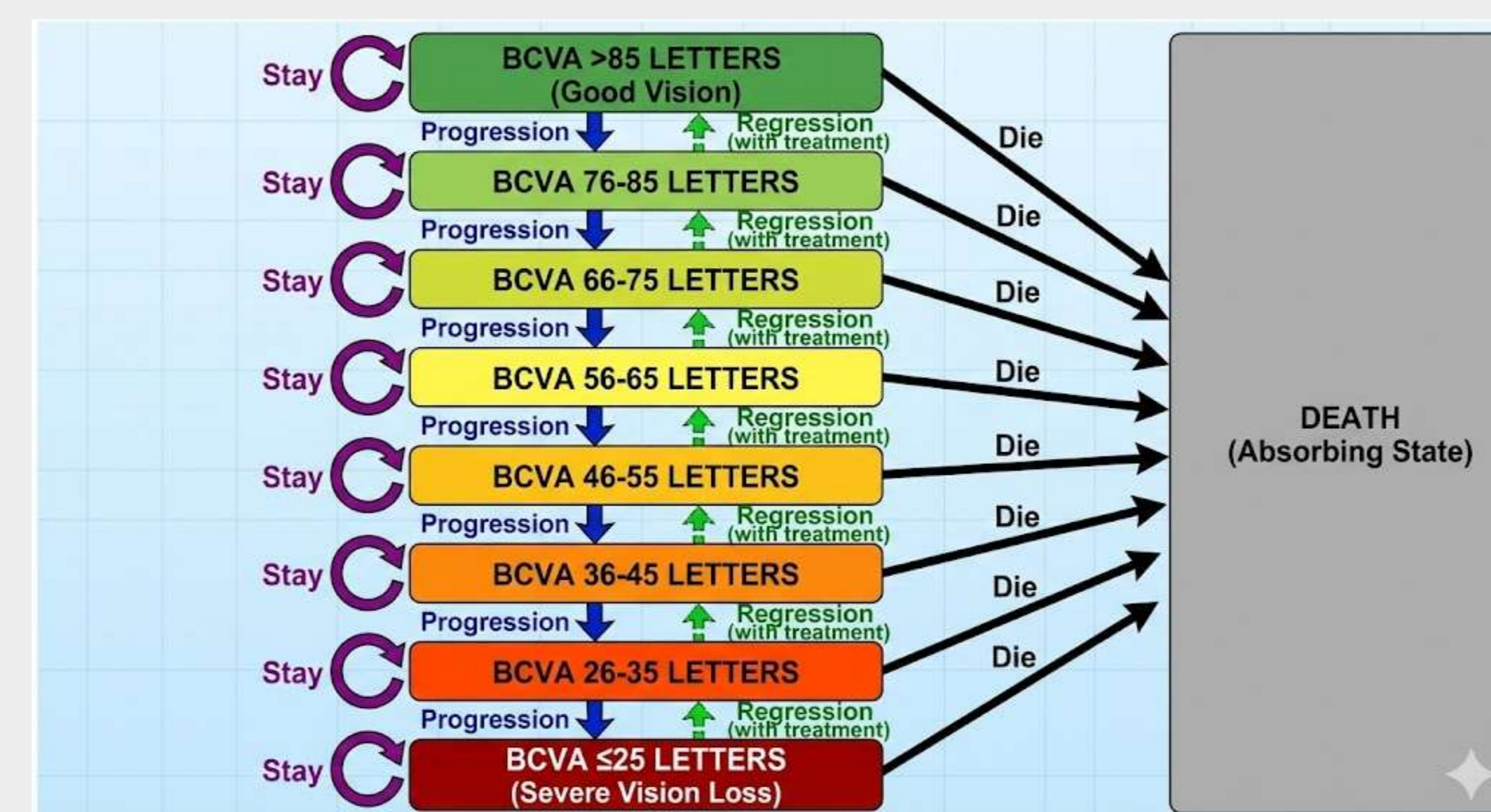
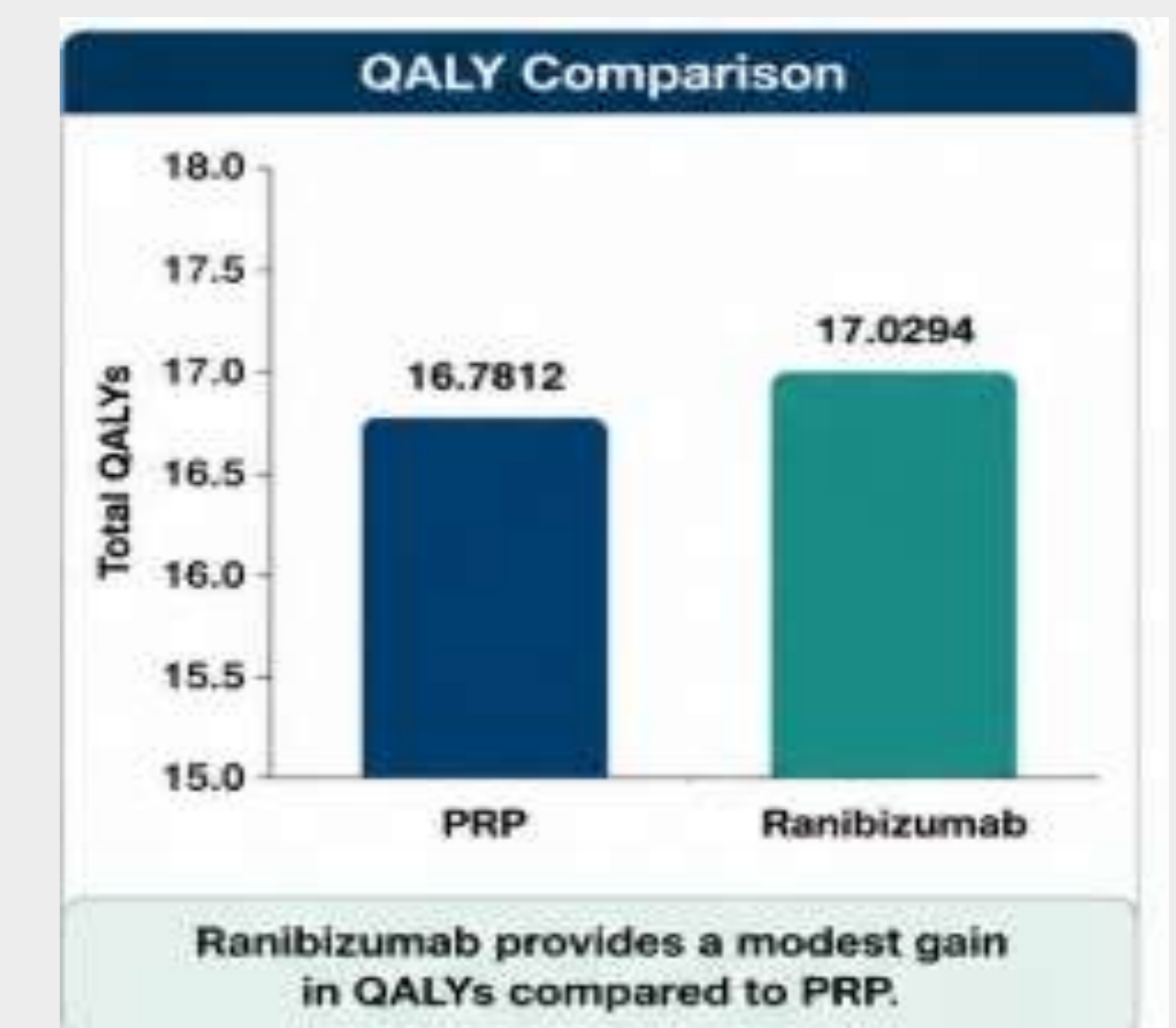
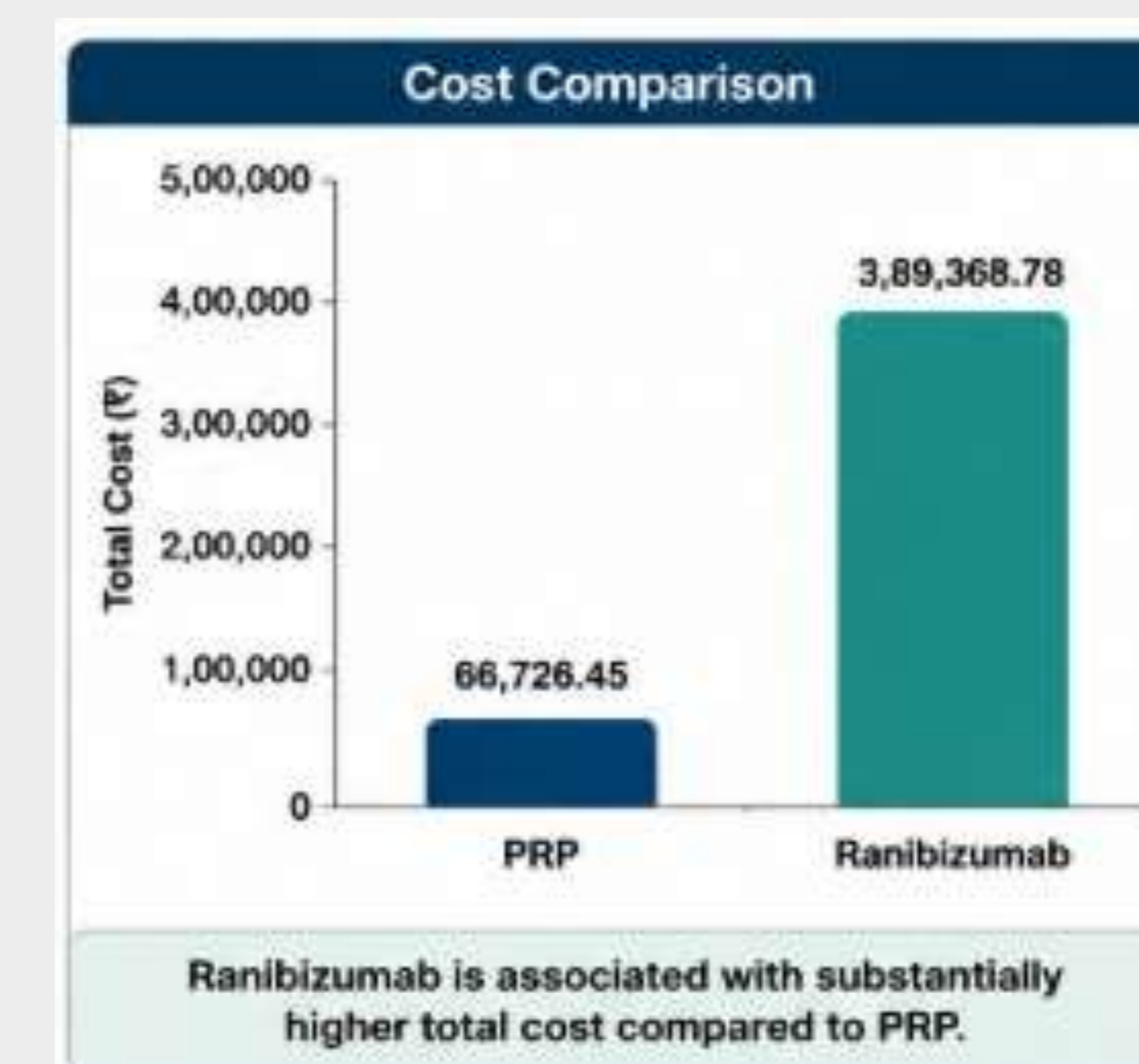
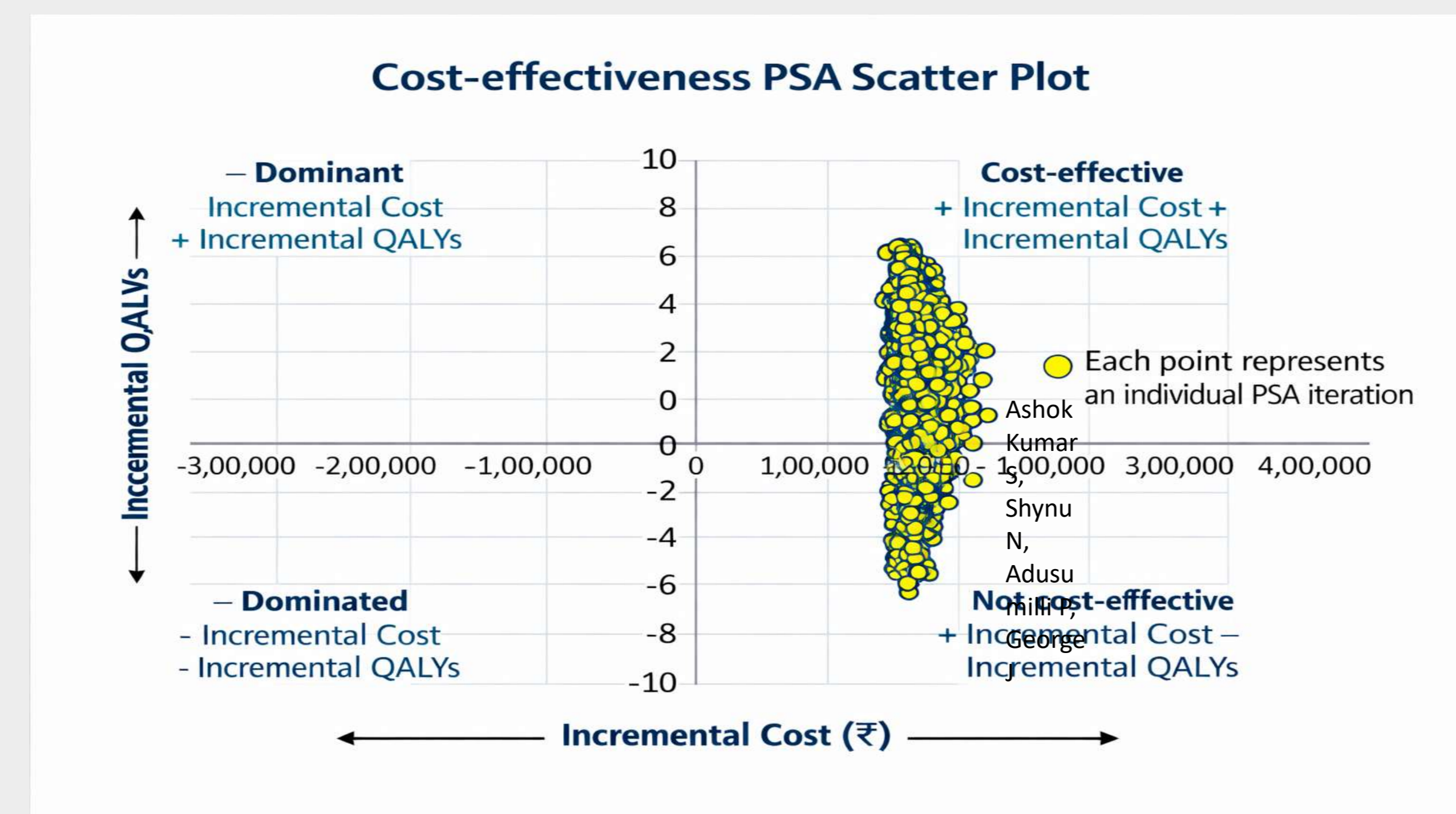
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INTRODUCTION: Proliferative diabetic retinopathy (PDR) is a common cause of blindness due to diabetic complications and a leading contributor of blindness in India. PRP has been considered the standard care because of its efficacy and lower costs. While ranibizumab has shown improved results, the drug's price is a matter of concern for cost-effectiveness in the Indian setting. In the present analysis, we attempted to evaluate the cost-utility of ranibizumab versus PRP.

OBJECTIVE: To evaluate the cost utility of ranibizumab compared with panretinal photocoagulation in patients with proliferative diabetic retinopathy in India using a Markov Model.

METHOD: A cohort-based Markov model was designed with 3 months as the time step, and 10 years as the time horizon. The transition probabilities, utilities, and costs used in the analysis were derived from published studies and clinical practice in India. The outcomes assessed in the study were cost, QALY, ICER, and probabilistic sensitivity analysis.

RESULT: Ranibizumab produced slightly higher QALYs than PRP but at substantially greater cost. Total costs were ₹66,726.45 for PRP and ₹3,89,368.78 for ranibizumab, with QALYs of 16.7812 and 17.0294, respectively. The ICER for ranibizumab was ₹13,00,256.33/QALY, exceeding commonly accepted cost-effectiveness thresholds in India.



Parameter	PRP	Ranibizumab	Incremental (Ranibizumab - PRP)
Total Costs (₹)	66,726.45	3,89,368.78	3,22,642.33
Total QALYs	16.7812	17.0294	0.2482
Incremental Cost-Effectiveness Ratio (₹/QALY)	-	13,00,256.33	-
Discount Rate	3%	3%	-
Time Horizon	10 years	10 years	-
Cycle Length	3 months	3 months	-

QALY: Quality-Adjusted Life Year; ₹: Indian Rupee

CONCLUSION: Ranibizumab provides additional clinical benefits over PRP in proliferative diabetic retinopathy but is not cost-effective at current prices in India. PRP remains the more economically preferred treatment option.

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