



Cost-Effectiveness of Bupropion for Self-Care ADHERence and Glycaemic Control in **Multimorbid** Type 2 Diabetes Mellitus and Mild Depression [ADHERE-DM] – A Cross-Over Randomized Controlled **Trial-Based Economic Evaluation**

RWD115

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INTRODUCTION

Type 2 Diabetes (T2D) and depression are strongly linked, creating a vicious cycle of poor health outcomes.

This multimorbidity leads to decreased self-care, poor glycaemic control, and higher healthcare costs.

The ADHERE-DM trial was a crossover RCT assessing if add-on bupropion could improve self-care adherence and glycaemic control (HbA1c) in patients with T2D and mild depression.

A modest improvement in HbA1c was observed. This prompted a post-hoc economic evaluation.

OBJECTIVES

To assess the cost-effectiveness of add-on bupropion versus standard care for improving glycaemic control in patients with T2D and mild depression from a patient perspective.

METHODS

Design: Within-trial post-hoc pharmacoeconomic evaluation of the ADHERE-DM crossover RCT [1]

Inputs: Drug acquisition costs (from a public pharmacy database).

Outcome: Change in Glycosylated Haemoglobin (HbA1c) over 3 months.

Perspective: Patient.

Missing Data Handling: Missing-at-random assumption followed by multiple imputation

Uncertainty: Bootstrapping (5,000 samples)

Cost-effect correlation: Seemingly Unrelated Regression

Estimates: Adjusted for age & baseline HbA1c

Standardization: Results are presented in Indian Rupees (INR) and converted to US Dollars (USD) using Purchasing Power Parity (PPP) for international comparison.

Cost-effectiveness threshold: As no official willingness to pay (WTP) threshold for HbA1c reduction exists in India; we conducted a literature search to contextualize our findings.

Sensitivity Analysis: We recalculated costs assuming patients purchased generic bupropion from government-run Jan Aushadhi centers [under Pradhan Mantri Bhartiya Janaushadhi Pariyojana] to evaluate the impact of lower drug prices.

Software: To promote open science, we used open-source freely available software systems (R version 4.3.2)

PRIMARY RESULTS

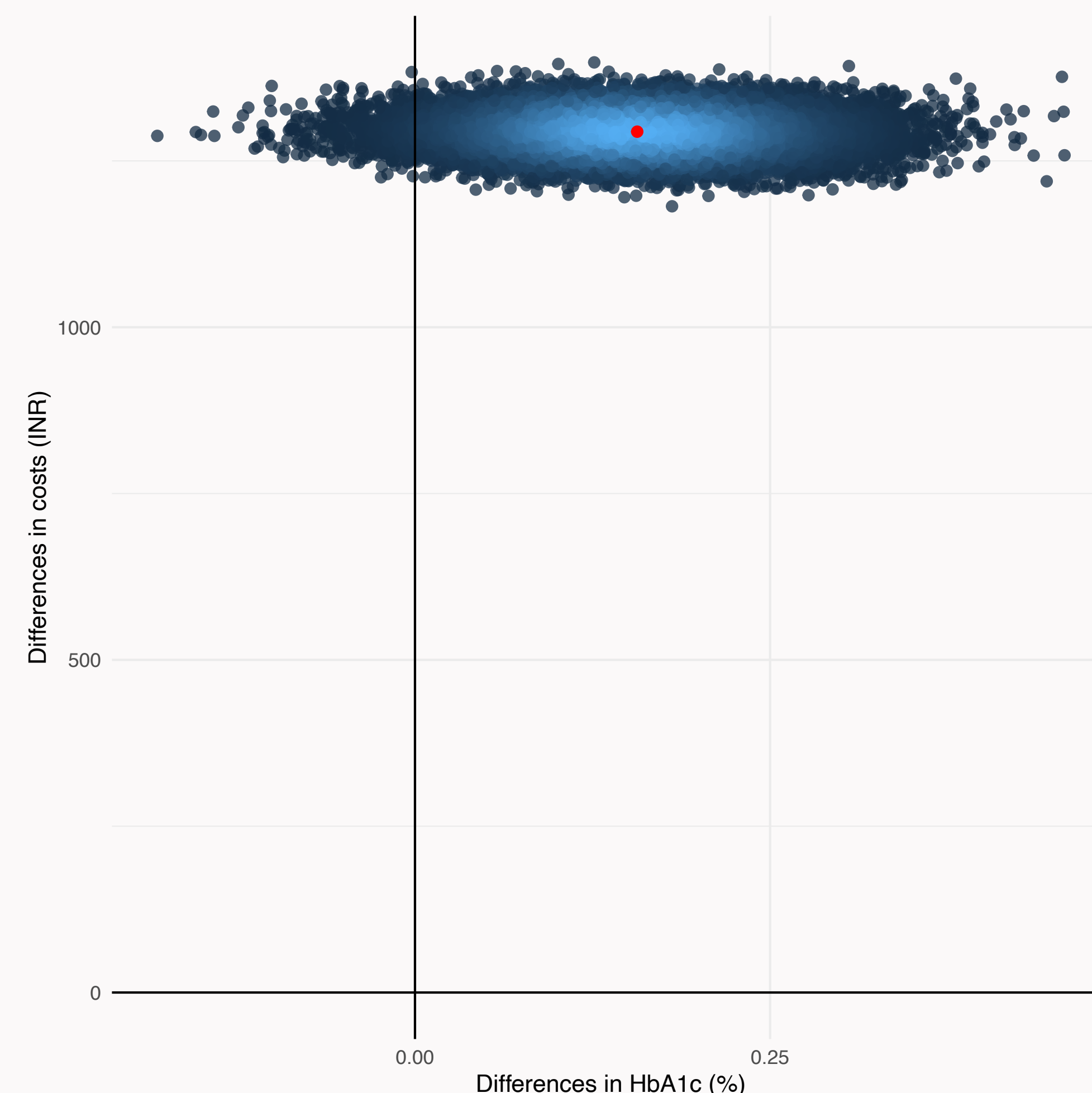


Figure: Bootstrapped cost-effect pairs.

The cost-effectiveness plane shows the uncertainty around the estimates.

Most bootstrapped pairs (blue dots) fall in the northeast quadrant, indicating the intervention is more effective but also more costly. The average ICER is marked in red.

Incremental Cost-Effectiveness Ratio: The cost to achieve a one percentage point reduction in HbA1c was ₹8,270.43 (equivalent to 406.91 USD, 2024 PPP-adjusted) [2]

CONTEXTUALIZING THE RESULTS

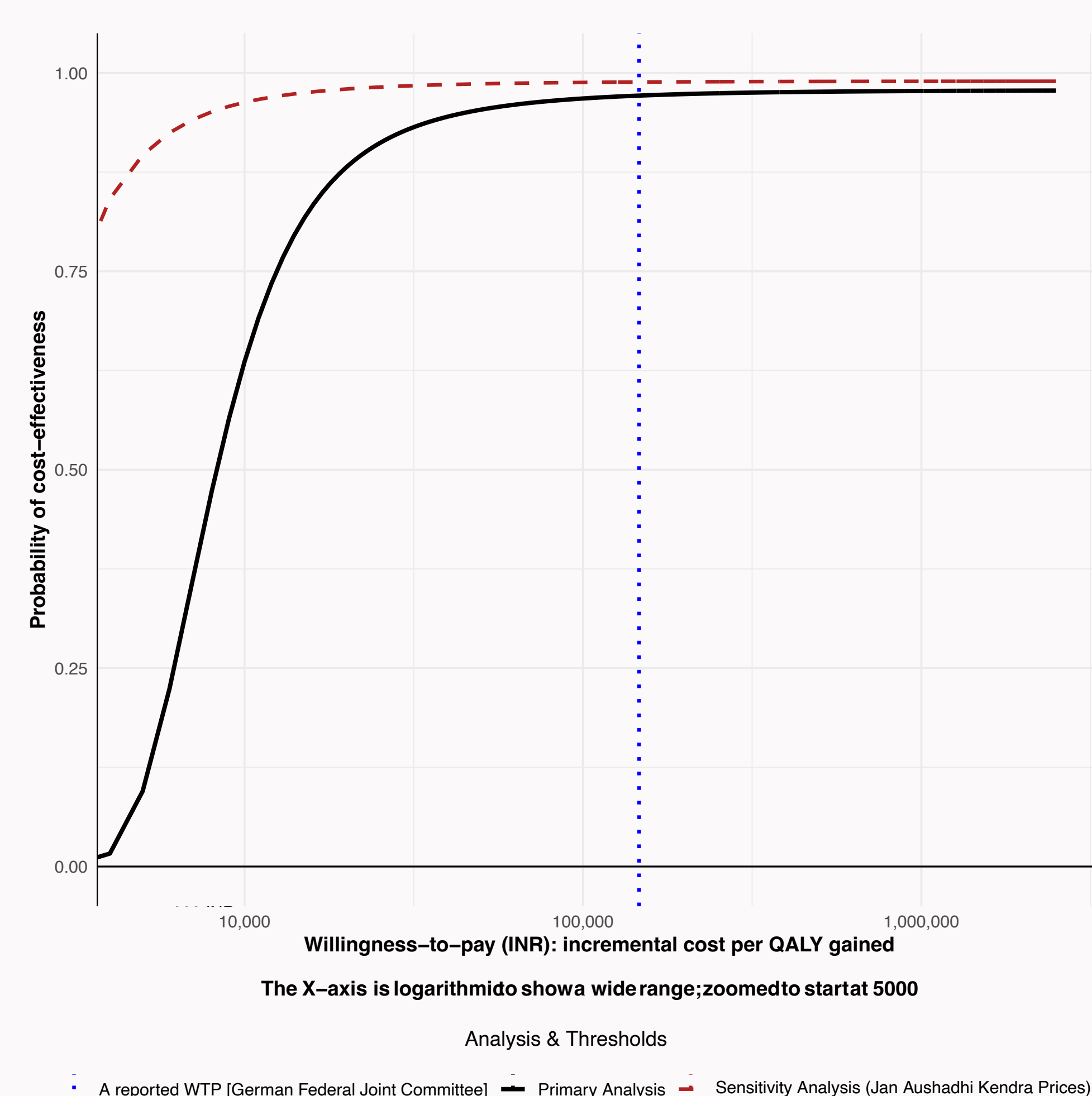


Figure: Acceptability Curve

A PubMed search for economic evaluations of diabetes pharmacotherapies yielded five reports of ICERs for improvement in HbA1c.

One German study calculated a WTP threshold based on regulatory submissions. [3] Against this adapted German threshold, our intervention showed a greater than 90% probability of being cost-effective.

While not ideal, this provided the best available benchmark for interpreting our Cost-Effectiveness Acceptability Curve (CEAC).

SENSITIVITY ANALYSIS – JAN AUSHADHI PERSPECTIVE

Assuming patients procured generic medicines from Jan Aushadhi centres, the ICER was significantly reduced.

This led to a 73% reduction in the ICER to ₹2,267.13 per % point reduction in HbA1c.

An increase in cost-effectiveness probability from 97.14% To 98.85%.

This highlights the substantial economic benefit of using affordable, generic alternatives.

CONCLUSIONS

While the clinical benefit on glycaemic control was modest, it was achieved at a relatively low incremental cost, suggesting potential cost-effectiveness.

For an international audience, the ICER of \$406.91 USD is highly competitive compared to other pharmacological treatments for T2D.

Utilizing affordable generic medicines makes the intervention even more cost-effective, underscoring the importance of public health initiatives in managing chronic diseases.

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CONFLICT OF INTEREST

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