

STREAM 2 Health Economic Analysis

Laura Rosu, 8th November 2022

On behalf of the STREAM Health Economic team



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CONFLICT OF INTEREST DISCLOSURE FORM

I have no Conflict of Interest to report.

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Please tick the type of affiliation / financial interest and specify the name of the organisation:

Receipt of grants/research supports: _____

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DATA COLLECTION AND METHODS IN THE ANALYSIS

Health Economic data were collected alongside the STREAM Stage II trial up to week 76 of follow-up in India, Ethiopia, Moldova and Uganda:

Two types of costs collected:

- Patient costs: direct (transport, food) and indirect (lost income)
- Health system costs: inpatient stay, lab costs, medication, social support, serious adverse events

Two types of outcomes used:

- Quality-adjusted life-years (QALYs), for the cost-utility analysis
- The trial's efficacy outcome, for the cost-effectiveness analysis

Two types of perspectives adopted:

- Health system
- Societal (health system costs plus patient costs)

Two comparisons:

- Oral vs. Control regimens
- Six-month vs. Control regimens

PATIENT COSTS ORAL VS. CONTROL

	Oral minus Control		
	Direct	Income loss	Total (% , 95% CI)
Ethiopia	-\$22	\$683	\$661 (42%, -66%; 150%)
India	-\$21	\$44	\$23 (2%, -30%; 33%)
Moldova	-\$26	-\$4,574	-\$4,600 (-39%, -92%; 13%)
Uganda	\$35	-\$647	-\$612 (-22%, -69%; 25%)

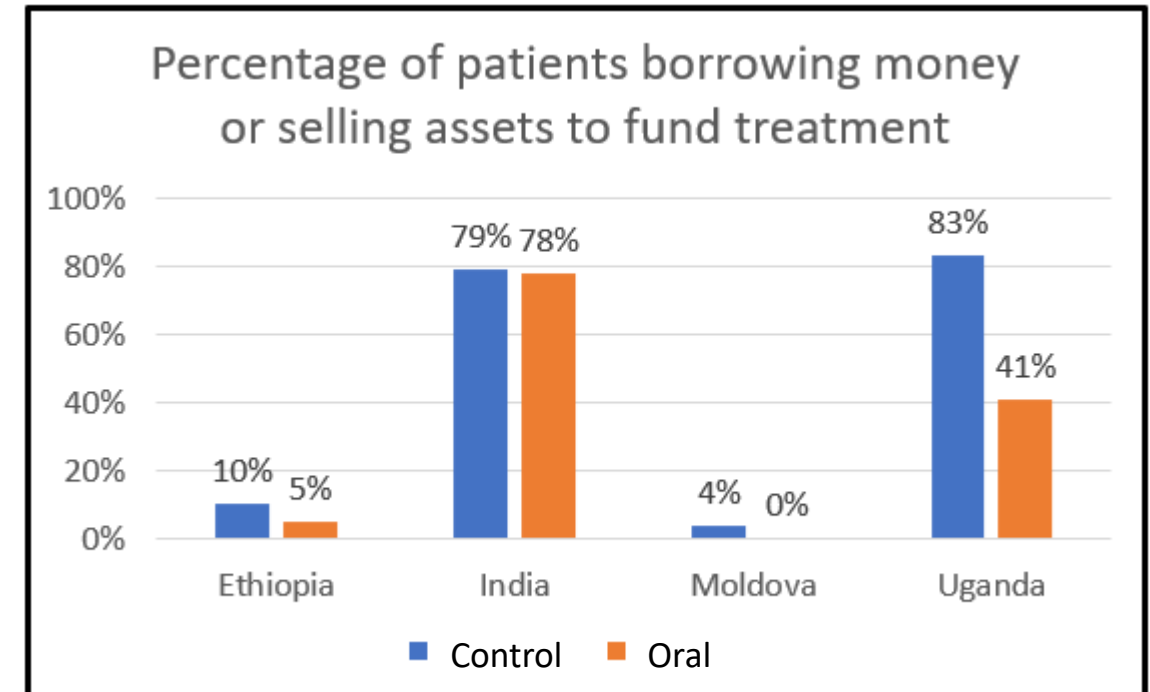
- Mean direct patient costs were lower in the Oral arm than Control in Ethiopia, India and Moldova and higher in Uganda
- Supplementary food expenditure is the main cost driver for patient direct costs
- Income loss was higher in the Oral in Ethiopia and India and lower in Moldova and Uganda
- In total, patients in the Oral regimen in Moldova and Uganda spent less than those in the Control arm; those in the Oral regimen in Ethiopia and India spent more than those in the Control arm

PATIENT OUTCOMES: CATASTROPHIC COSTS

WHO definition of catastrophic cost: if total costs due to TB exceed 20% of their annual household income

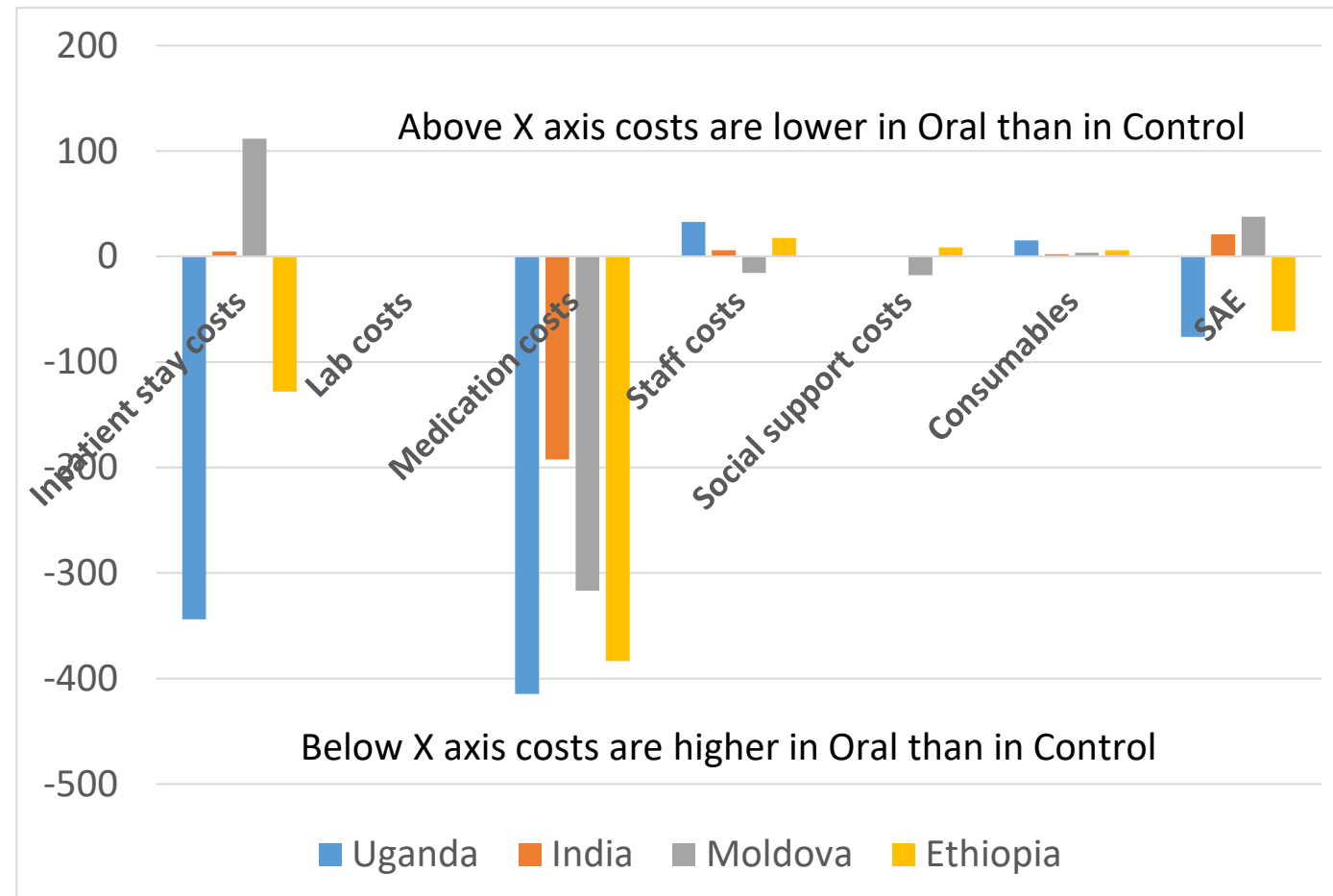
The proportion varied slightly between countries, but there was no important difference in the pooled samples between arms

The percentage of patients borrowing money or selling assets was high in India and Uganda



MEAN HEALTH SYSTEM COSTS PER PATIENT OF ORAL VS. CONTROL

- Oral regimen has greater health system costs in all countries
- Medication costs were higher in the Oral regimen than Control in all countries
- Inpatient stay costs were lower in the Oral regimen in India and Moldova
- No difference in terms of lab costs as it was assumed that everyone is following the same assessment schedule



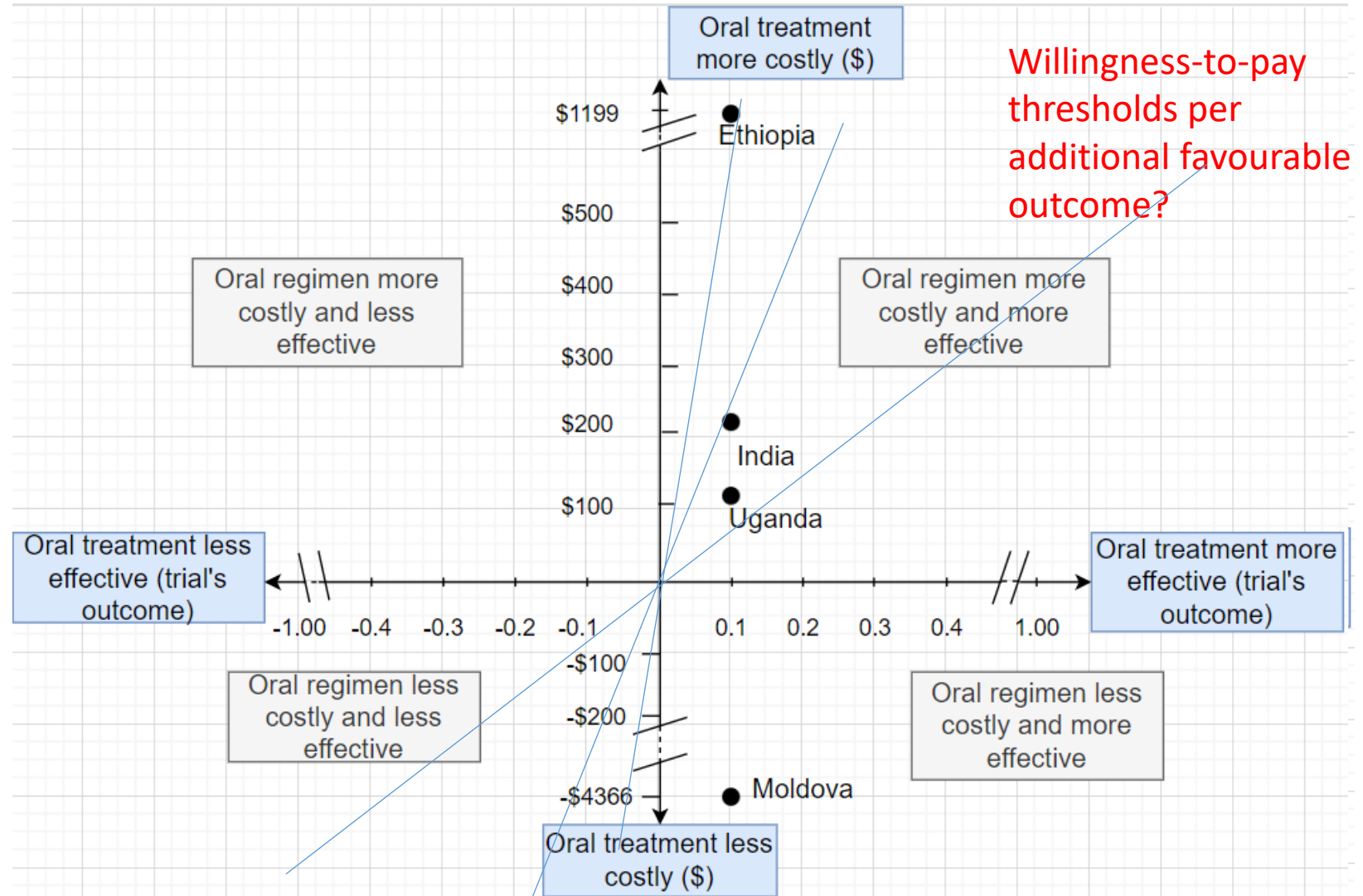
COST-UTILITY AND COST-EFFECTIVENESS ANALYSES

Cost-effectiveness analysis (trial's efficacy outcome is used as the outcome) from a societal perspective

In Ethiopia, India and Uganda the Oral regimen is more costly but also more effective

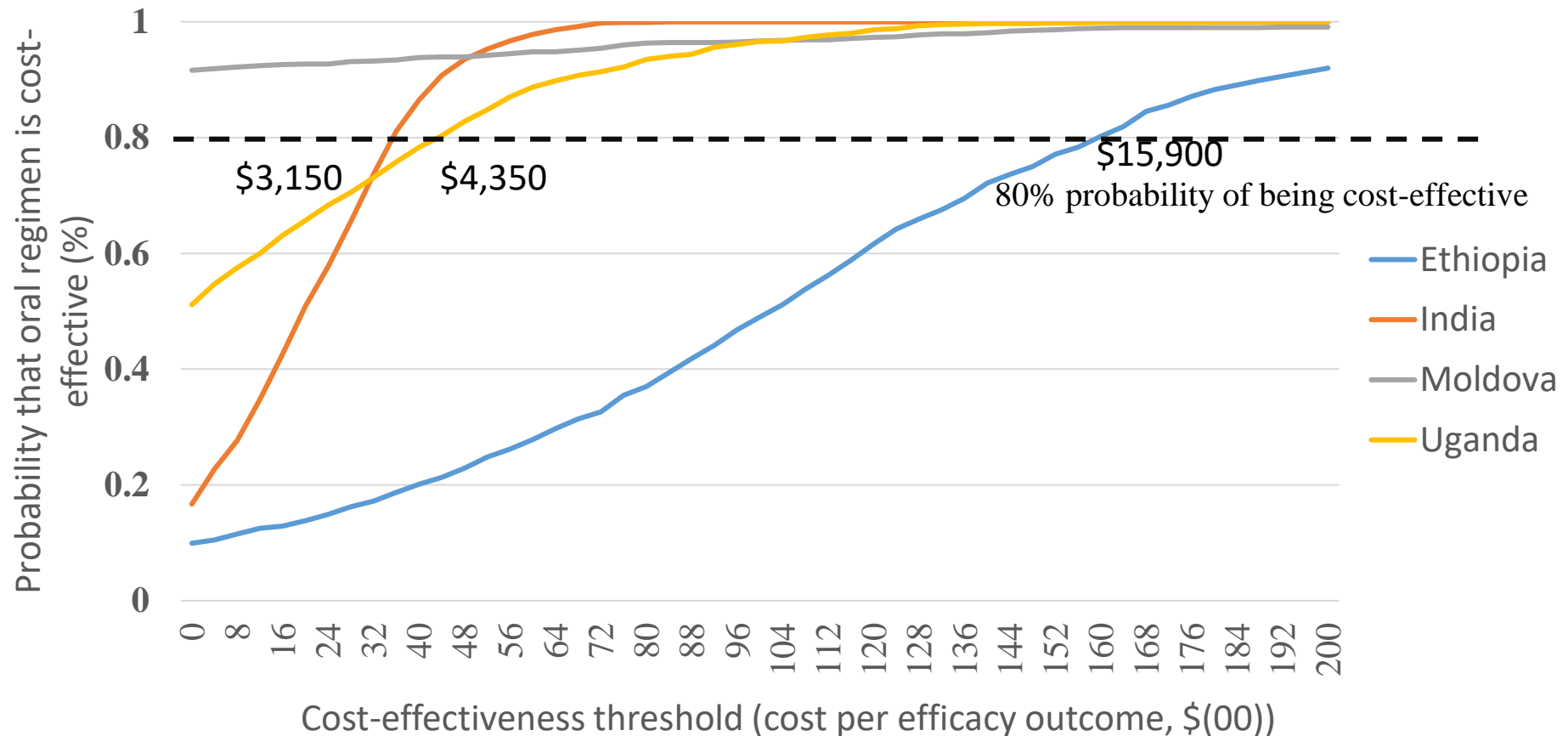
In Moldova the Oral regimen is less costly and more effective, so dominant

No willingness-to-pay thresholds available to assess cost-effectiveness



COST-UTILITY AND COST-EFFECTIVENESS ANALYSES

Cost-effectiveness acceptability curve of the Oral vs. Control regimen



The Oral regimen has a probability higher than 80% of being cost-effective in Moldova regardless of the willingness-to-pay threshold

In India, Uganda and Ethiopia the threshold needs to be higher than \$3,150, \$4,350 and \$15,900, respectively, to have a probability higher than 80% of being cost-effective

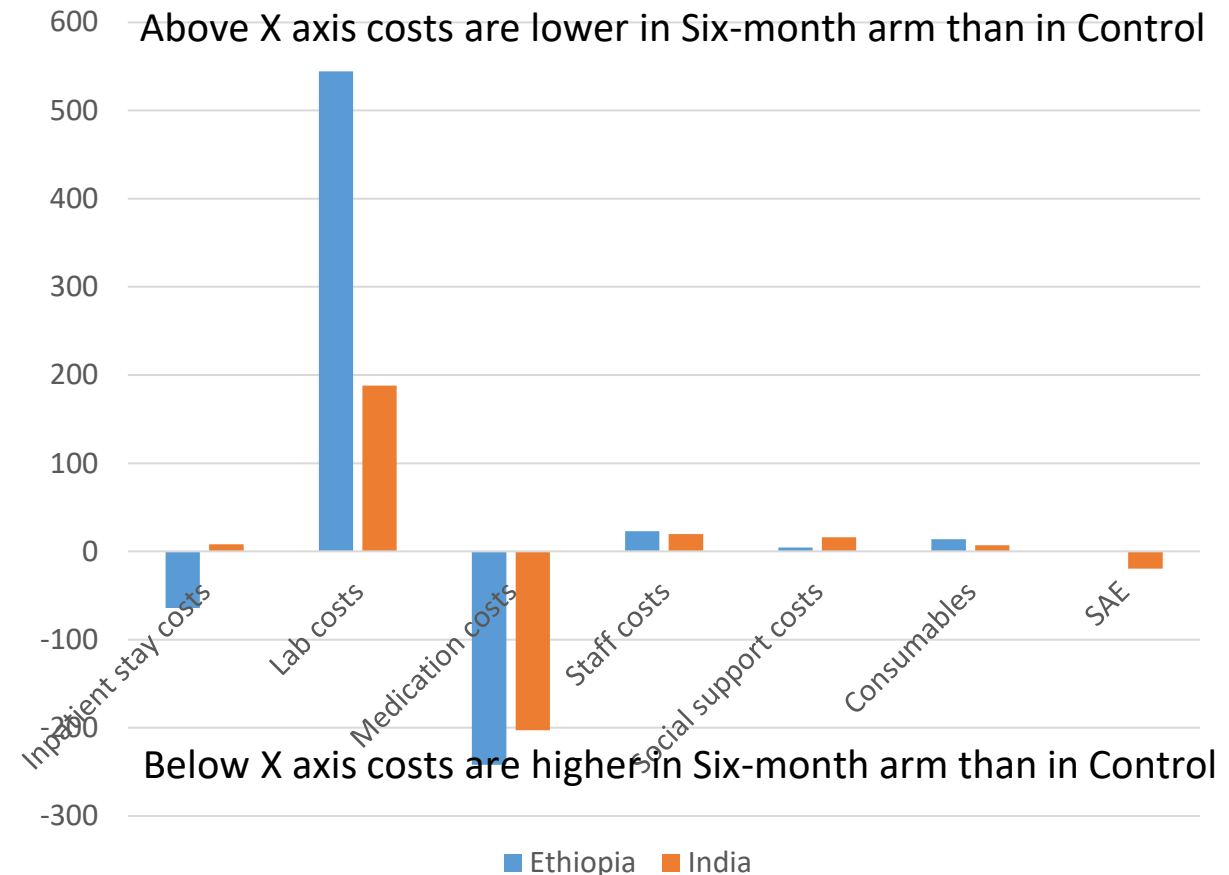
PATIENT COSTS SIX-MONTH VS. CONTROL

	Six-month minus Control		
	Direct	Income loss	Total (% , 95% CI)
Ethiopia	-\$39.9	-\$653.3	-\$693.2 (-44%, -45%; 26%)
India	-\$58.0	-\$76.3	-\$134.3 (-9%, -127%, 40%)

- Low number of patients enrolled in the Six-month arm in Moldova and Uganda, so analysis not conducted for these countries
- Mean direct costs lower in the Six-month arm in Ethiopia and India; difference statistically significant in India
- Mean income loss lower in the Six-month arm in both Ethiopia and India; differences not statistically significant
- Patients in the Six-month regimen had lower total costs

MEAN HEALTH SYSTEM COSTS PER PATIENT OF SIX-MONTH VS. CONTROL

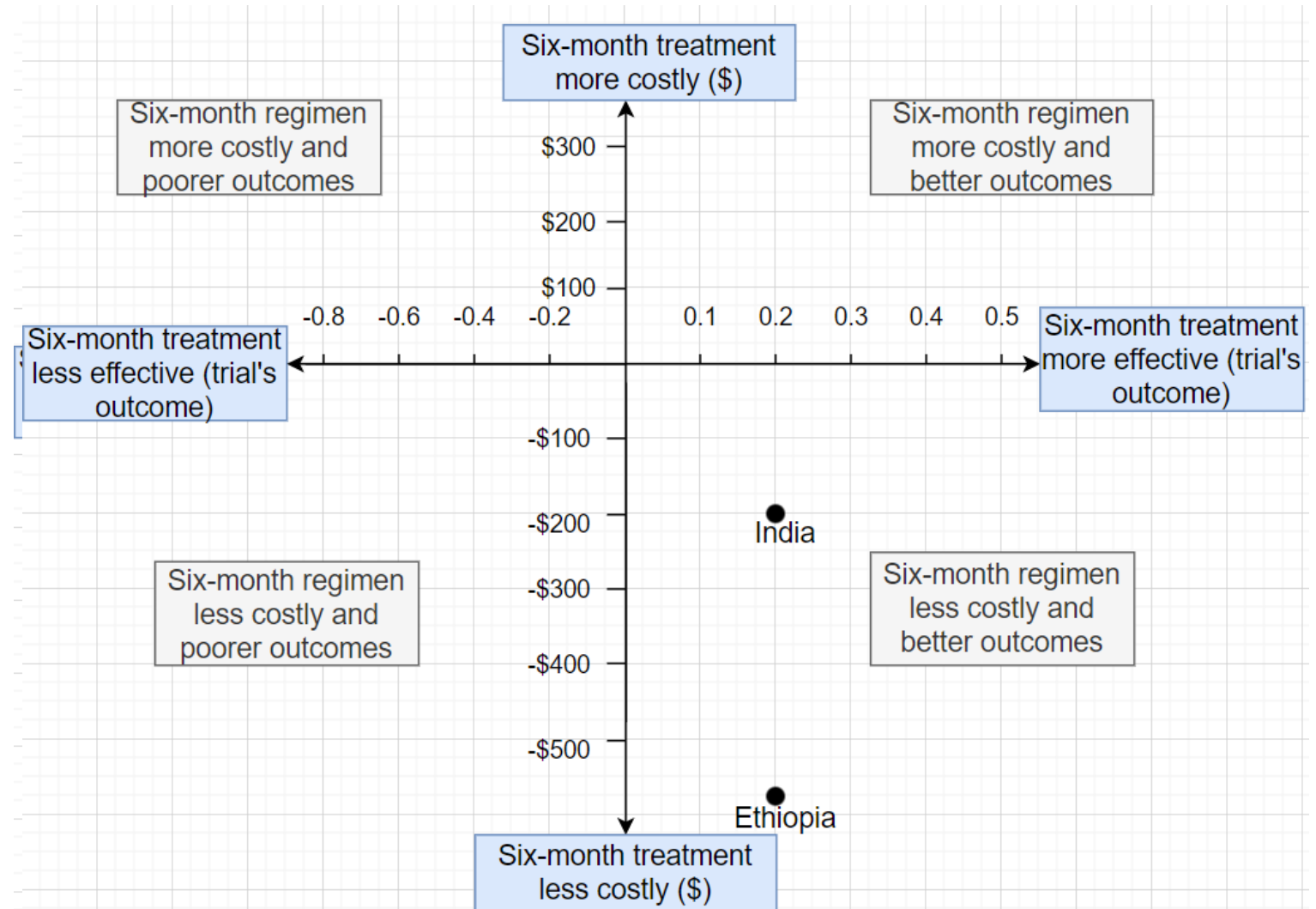
- Six-month regimen has lower health system costs than Control in both Ethiopia and India
- Medication costs were higher in the Six-month regimen than Control in both countries
- There were savings for the Six-month regimen in the of lab, staff, social support and consumables cost categories



COST-UTILITY AND COST-EFFECTIVENESS ANALYSES

Cost-effectiveness analysis (trial's efficacy outcome used as an outcome) from a societal perspective

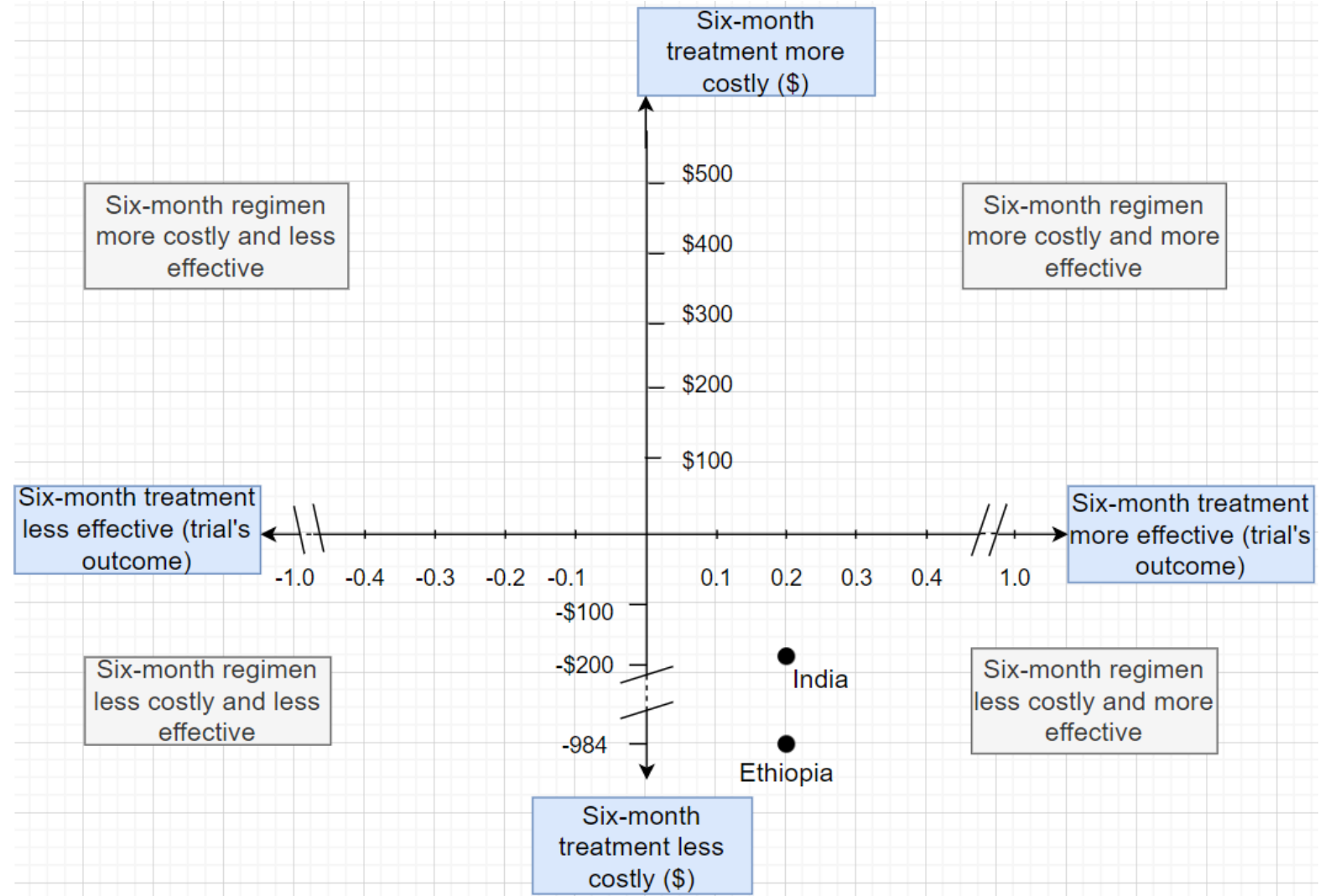
Six-month regimen is considered cost-effective in both Ethiopia and India



COST-UTILITY AND COST-EFFECTIVENESS ANALYSES

Cost-effectiveness analysis (trial's efficacy outcome used as an outcome) from a societal perspective

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SENSITIVITY ANALYSES

- Results were robust to most of the sensitivity analyses conducted (using the country-specific efficacy outcome, removing data collected retrospectively, or conducting complete case analysis instead of multiple imputations to account for the missing data)
- However, results were sensitive to the cost of bedaquiline. Reducing the price of the 200mg pill from \$1.81 to \$1.00 would make the Oral regimen cost-effective in India and Moldova in the CUA and make the Oral regimen cost-effective in India in the CEA analysis

CONCLUSIONS ORAL VS. CONTROL

- Oral regimen reduces participant costs in Moldova and Uganda, and it results in higher health system costs across all countries
- In addition, QALYs are lower in Ethiopia, India and Uganda and higher in Moldova
- Two analyses conducted:
 - Cost-utility analysis: Oral regimen not cost-effective in Ethiopia, India and Uganda, but cost-effective in Moldova
 - Cost-effectiveness analysis: Oral regimen cost-effective in Ethiopia, India and Uganda if the willingness-to-pay thresholds per each additional favourable outcome are higher than \$15,900, \$3,150 and \$4,350 respectively

CONCLUSIONS SIX-MONTH VS. CONTROL

- Six-month regimen reduces participant costs and results in lower health system costs; from a societal perspective it is cheaper than Control in both Ethiopia and India
- In addition, QALYs are higher in India and slightly lower in Ethiopia
- Two analyses conducted:
 - Cost-utility analysis: Six-month regimen is cost-effective in Ethiopia and India
 - Cost-effectiveness analysis: Six-month regimen is cost-effective in both Ethiopia and India
- All results reported cover the period from randomisation to week 76. Longer term costs and outcomes on participants will be reported once follow-up data to week 132 are available

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