

Introduction

- Globally, India has the highest burden of tuberculosis (TB), with two deaths occurring every three minutes from TB (WHO, 2025).
- TB has a long treatment period, varying from 6-24 months. The long period causes TB patients to endure high costs (Jeyashree et al., 2024).
- There is a significant disparity in out-of-pocket (OOP) costs incurred between public vs private healthcare-seeking TB patients:
 - 85.2% of households incurred catastrophic health expenditures (CHE) for private hospitalization (16.5% for public)
 - 89.1% of households incurred CHE for private outpatient care (35.3% for public) (Yadav et al., 2021)
- Indian government has implemented a conditional cash transfer (CCT) scheme for TB patients called Nikshay Poshan Yojana (NPY) (Patel et al., 2019).
 - Patients receive USD 7.51 / month
 - Fixed amount, irrespective of household size or poverty level
 - Covers only nutrition-related costs

Objectives

- Increased financial support for TB patients should cover a broader range of costs (e.g., wages lost, transportation costs).
- We aimed to assess the equity benefits of private care-seeking TB patients receiving a higher transfer amount to offset the greater costs (both direct + indirect) of private care by modeling 4 alternative CCT scenarios.
- In alternative scenarios:
 - The benefit is applied flexibly across all OOP costs (i.e., direct medical/non medical, indirect & nutrition).
 - Allocation of benefit is weighted based on each Indian state’s proportion of population in lower quintiles.

Methods

1. Data Sources
- Peer-reviewed journal articles, the National TB Prevalence Survey India (2019-2021), India TB Report (2024), Gov’t of India Ministry of Health & Family Welfare surveys (2022)
2. Data Description
- Representative sample of geographic areas, TB epidemiology, & inequality (in 2019)
 - Outcomes Modeled: TB treatment adherence; # of households with CHE (>20% of annual income) and impoverishing health expenditures (IHE) (< national poverty line of \$0.53/day)

Alternative Intervention Scenarios	Public Benefit (\$/month)	Private Benefit (\$/month)
Scenario 1	\$15.56 (2x status quo)	\$20.75 (2.76x status quo)
Scenario 2	\$22.53 (3x status quo)	\$37.55 (5x status quo)
Scenario 3	\$30.04 (4x status quo)	\$45.06 (6x status quo)
Scenario 4	\$37.55 (5x status quo)	\$52.57 (7x status quo)

*All costs are in USD and adjusted for inflation using CPI values for India

State/India	Region	Population Size	TB Prevalence (per 100,000)	TB Deaths	Case Fatality Ratio (%)	Gini Coefficient
India	National	1,370,508,600	316.00	73,793	3.08%	0.338
Uttar Pradesh	North	237,882,725	481.00	13,494	2.77%	0.21
Bihar	East	124,799,926	327.00	2,615	2.14%	0.22
Tamil Nadu	South	77,841,267	301.00	4,108	3.75%	0.10
Maharashtra	West	123,144,223	161.00	7,150	3.17%	0.17

Results

Table 1. The Impact of CCT Scenario on TB Treatment Adherence

Service Provider	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Public	7.8%	11.5%	14.35%	16.6%
Private	10.7%	16.6%	18.4%	20.0%

Figure 1. Concentration Curves of OOP Costs (Pre-Post Scenario #4) for Public Care-Seekers

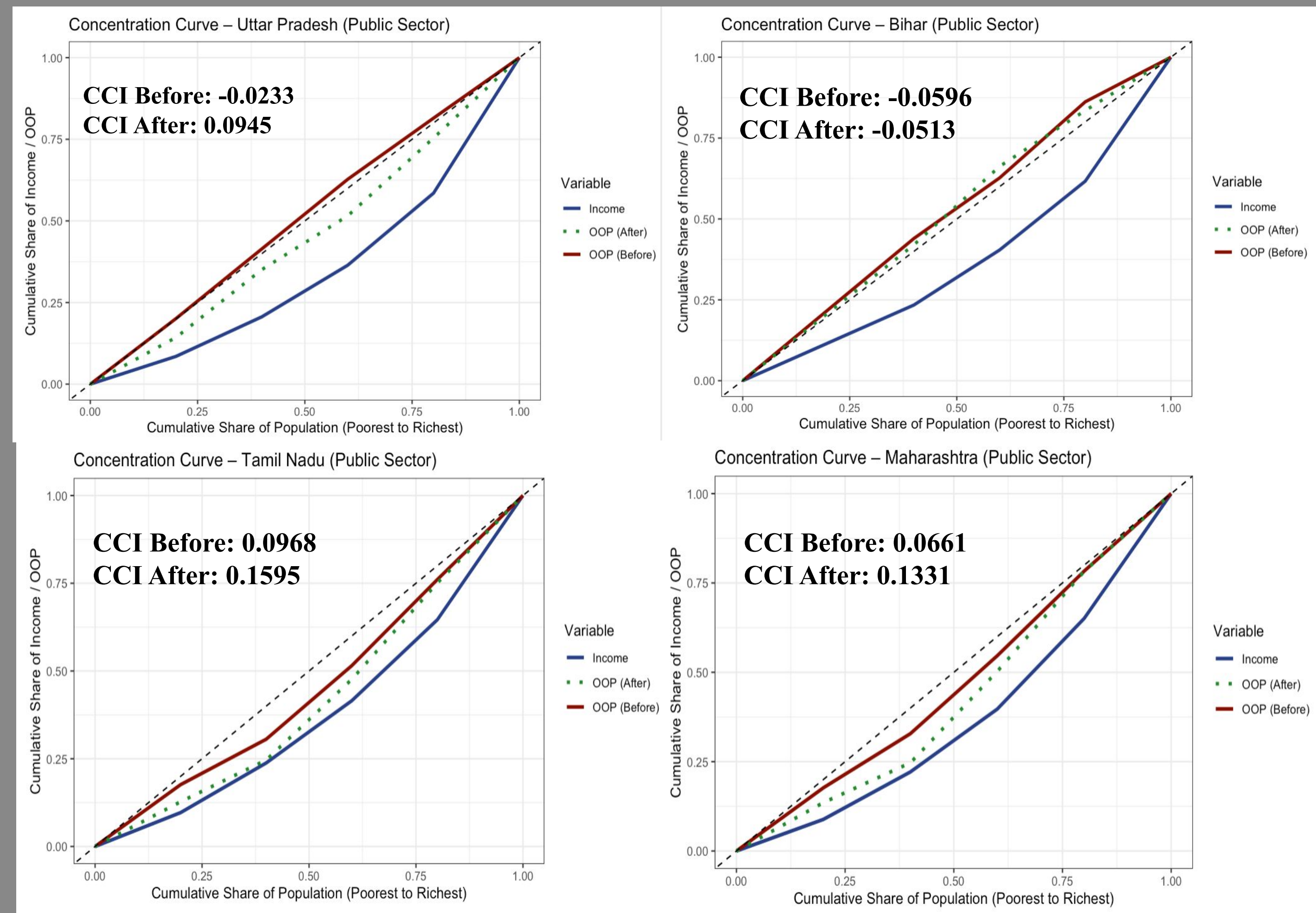
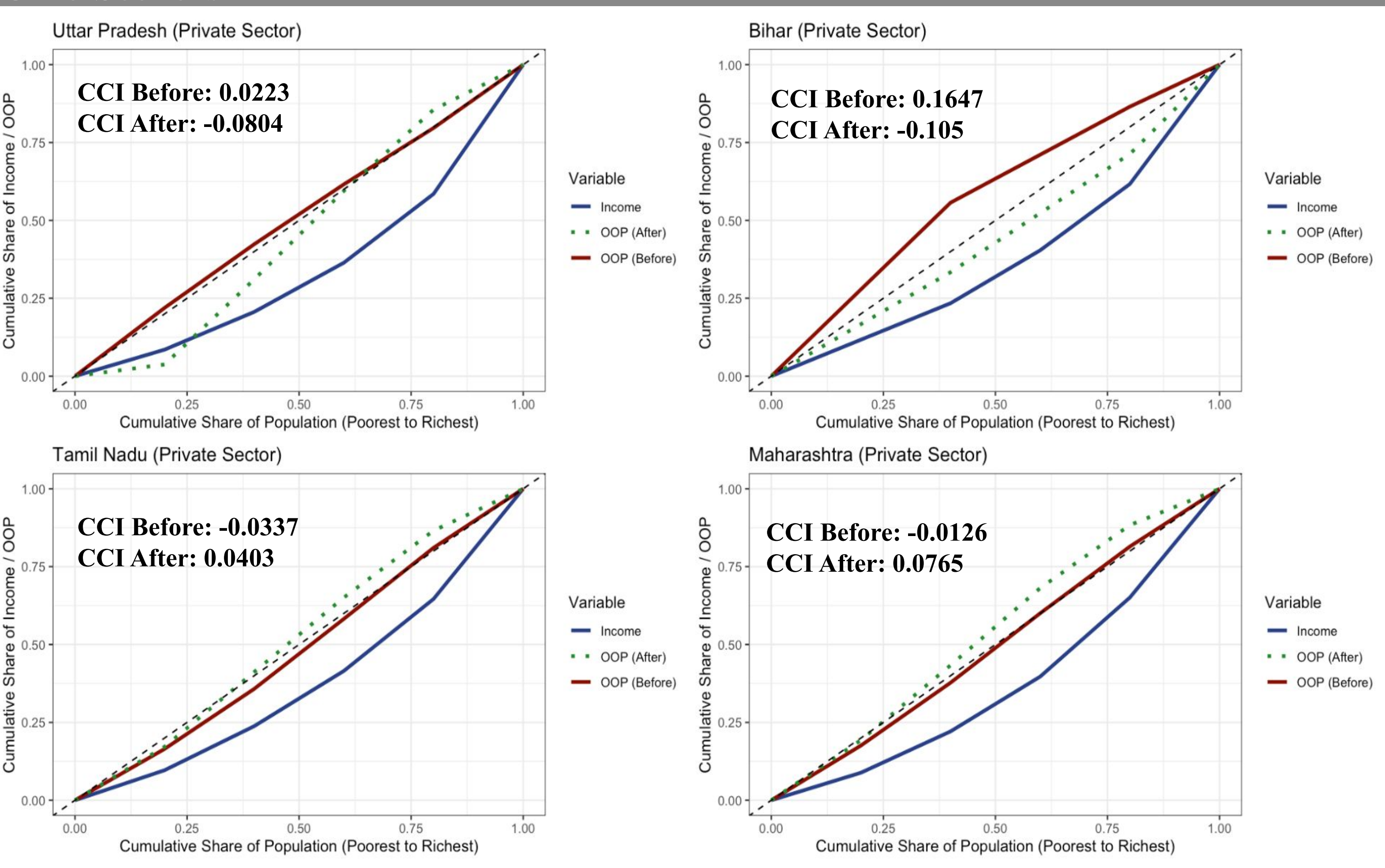


Table 2. CHE & IHE Cases at the Household Level (Scenario #4)

CHE Cases Averted (Public)	CHE Cases Averted (Private)	IHE Cases Before (Public)	IHE Cases After (Public)	IHE Cases Before (Private)	IHE Cases After (Private)
Uttar Pradesh: 217,182	Uttar Pradesh: 236,690	Uttar Pradesh: 147,709	Uttar Pradesh: 0	Uttar Pradesh: 95,322	Uttar Pradesh: 0
Bihar: 34,377	Bihar: 121,441	Bihar: 92,640	Bihar: 58,263	Bihar: 37,599	Bihar: 0
Tamil Nadu: 65,363	Tamil Nadu: 3,970	Tamil Nadu: 19,481	Tamil Nadu: 0	Tamil Nadu: 12,572	Tamil Nadu: 12,572
Maharashtra: 23,967	Maharashtra: 24,286	Maharashtra: 16,593	Maharashtra: 0	Maharashtra: 10,708	Maharashtra: 10,708

Figure 2. Concentration Curves of OOP Costs (Pre-Post Scenario #4) for Private Care-Seekers



Discussion

- Greater CCT amounts lead to higher treatment adherence (particularly among private care-seekers).
- CCT Scenario #4 yielded greatest reductions in CHE, notably among public care-seekers in Uttar Pradesh and Bihar (poorer states).
- IHE cases fell to 0 under Scenario #4 in all but Bihar’s public sector.
- Gains for private care-seekers were modest in Tamil Nadu and Maharashtra, likely due to higher baseline costs and more equitable income distributions.
- In poorer states (Bihar and Uttar Pradesh), the intervention may need to be revised to account for higher baseline vulnerability, as they still bear a disproportionate share of OOP costs post-intervention.

- Strengths:
 - Incorporated a state-specific weighting scheme for allocating benefits based on wealth quintiles.
 - Stratification by service provider provides nuanced analysis.
- Limitations:
 - Used a static model, does not allow for disease progression to be reflected in the estimates.
- Recommendations:
 - Prioritize high-risk states like Bihar, where baseline OOP costs remain high despite interventions, through free diagnostics and progressive benefits.

Have questions?

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References

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