



Human Opportunity Index and circumstances behind the inequality in maternal health care: Evidences from India

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Unequal access to maternal health care (Inequality of Outcome) due to differences in:

1. Efforts & choices made
2. Opportunities: Owing to very different circumstances
Which remain out of the control of the individual (Roemer 1998)

Inequality and Human Opportunity Index on Maternal Health care in India

- Inequalities in society lead to inequalities in health, resulting in a social gradient in health, implying worse health for individuals with lower social position (Marmot et al, 2010)
- Studies do identify huge inequality in access to maternal health care in developing countries, particularly India (Mooney *et al* 1991; Culyer *et al* 1992; Mukherjee and Levesque, 2010; Joe *et al*, 2008; Prinja *et al*, 2012).
- However, studies on Human Opportunity Index in maternal care in India are rare. This study fills this gap.
- Adds the dimension of quality of maternal care received.
- The two time points: before and after Health Care reform in the form of National Rural Health Mission in India.

Quality Issues

- Technical quality is difficult to measure.
- Receipt of service components after reaching the healthcare facility.
- Two approaches:
 1. Das et al (2014) used standardized patients recruited from the local community and trained to present consistent cases of illness to providers.
 - They assessed the quality of providers' medical care by measuring adherence to case-specific checklists of essential care, the likelihood of correct diagnosis, and the appropriateness of treatment.
 2. The receipt of recommended services as per the cubic framework of policy intervention (Selvaraj et al., 2014; Asher & Bali, 2015; Dutta & Ghosh 2016).
 - *What is interesting is to explore if there is inequality in receipt of quality of healthcare, because once the patients reach healthcare facilities, they are supposed to receive all recommended services equally. Inequality of quality and its HOI are seldom studied with respect to maternal healthcare.*

Objectives of the study

- This study seeks to find the changes in inequality of opportunity in access to and quality of maternal healthcare services at two time points before and after the healthcare reform (2005-06 and 2015-16).
- Decompositions are used to assess the marginal contribution of each individual circumstance to the inequality in 2005-06 and after a decade from the reform.

Hypothesis

- It can be recalled here that NRHM and later NHM aimed at policy intervention to reduce inequalities emanating from social and economic perspectives.
- Incentive schemes were offered as conditional cash transfer, namely Janani Suraksha Yojana, for women belonging to households living below the poverty line and socially backward ethnic groups for using both ANC and ID.
- Thus, the marginal contribution of wealth and caste are supposed to go down in inequality of maternal health care outcomes, both in access and quality.

Data & Measurement

- Unit level data from NFHS 3 (2005-06) and NFHS 4 (2015-16) have been used for the analysis. For the study seventeen (17) major states were selected.
- The index for access to ANC is defined as the *% of pregnant women who had their first antenatal check within the first trimester.*
- For quality of ANC, *three dimensions* are taken into account:

Received from trained personnel

Services received (weighed, blood pressure measured, urine sample taken, blood sample taken, given or bought iron tablets or syrups, two tetanus injections given)

Informed about possible pregnancy complications (like vaginal bleeding, convulsions, prolonged labour).

If *all* three dimensions are satisfied it is said that ANC has been matched with expected quality and the index for quality of ANC in the state is defined as the percent of women seeking ANC actually getting all three facilities.

Data & Measurement

- The index for *access to ID* is defined as the percent of women seeking institutional delivery out of total deliveries.
- The quality of ID has *two dimensions*:
- Delivery is assisted by trained personnel
- Services: whether the postpartum check-up is received within a day and the child is brought for breastfeeding within one hour of birth.
- Since it is difficult for women undergoing caesarean section to breastfeed their babies within one hour of the operation, only normal deliveries have been considered.
- If *both* the dimensions are satisfied it can be said that quality care in case of ID is being received and index for quality of ID in the state is defined as the percent of women having normal deliveries in healthcare institutions getting these facilities

Methodology

- HOI summarizes two elements: (i) how many opportunities are available, that is, the coverage rate of a basic service (ANC and Institutional Delivery here); and (ii) how equitably those opportunities are distributed, across exogenous circumstances.
- The Dissimilarity Index (D-index) measures whether existing opportunities (access to maternal health care and quality of the health care received) are allocated equitably, comparing different circumstance groups' (depending upon factors associated with their location, ethnicity, religion etc) probabilities of accessing a given opportunity.
- Scale effect captures the change in the provision of opportunities over time & Distribution effect captures how the distribution of the existing opportunities changes

Access & Quality indices across states in India

States	Antenatal Care				Institutional Delivery			
	Access		Quality		Access		Quality	
	2005-06	2015-16	2005-06	2015-16	2005-06	2015-16	2005-06	2015-16
Himachal Pradesh	60.14	70.97	19.88	31.71	50.54	76.94	36.73	42.85
Rajasthan	35.52	63.84	10.64	26.36	33.84	85.72	21.55	41.61
Punjab	60.24	76.67	14.00	55.35	54.53	92.81	20.54	52.05
Haryana	50.74	63.90	7.79	45.85	37.57	83.72	30.04	46.73
Uttar Pradesh	31.33	47.54	6.91	18.32	26.46	70.09	11.80	27.12
Bihar	22.71	36.52	13.41	22.35	26.84	68.25	5.62	29.02
West Bengal	42.62	56.83	13.59	33.43	54.58	79.81	36.51	46.64
Odisha	50.79	65.30	7.99	29.99	41.12	85.79	40.85	55.43
Jharkhand	36.40	51.33	11.27	19.42	24.07	64.24	16.36	32.09
Maharashtra	64.67	68.06	14.32	34.78	74.06	90.03	45.06	51.22
Gujarat	54.82	71.17	16.79	32.50	56.66	87.59	30.08	44.36
Chhattisgarh	48.41	70.01	9.42	29.37	19.47	72.41	42.67	46.39
Madhya Pradesh	48.09	51.86	14.95	25.49	42.37	81.14	35.09	30.10
Andhra Pradesh	66.07	82.33	11.91	30.20	75.74	92.38	35.69	58.03
Karnataka	70.39	68.53	12.52	33.31	66.39	94.16	43.87	40.77
Tamil Nadu	77.88	63.31	19.35	23.71	90.81	99.22	69.01	53.59
Kerala	91.90	94.74	13.03	17.89	99.40	99.95	53.31	68.90
All India	50.19	57.25	12.33	27.31	48.82	79.36	36.66	39.08

Decomposition of quality of ANC received across three dimensions

States	Received from trained personnel		Services received		Advice received		Quality received	
	2005-06	2015-16	2005-06	2015-16	2005-06	2015-16	2005-06	2015-16
Himachal Pradesh	89.54	93.44	60.84	63.31	35.87	49.57	19.88	31.75
Rajasthan	93.19	83.06	65.39	74.96	16.30	42.82	10.64	26.35
Punjab	83.75	87.29	60.33	84.60	28.20	76.33	14.10	55.32
Haryana	61.81	83.11	70.11	78.55	12.90	66.52	7.79	45.83
Uttar Pradesh	95.56	83.31	65.18	75.87	10.97	28.75	6.91	18.32
Bihar	94.91	78.97	45.16	77.21	24.62	35.61	13.41	22.32
West Bengal	92.05	70.16	71.16	80.67	18.78	63.93	13.24	33.17
Odisha	70.67	56.72	66.64	81.01	17.92	64.17	7.98	29.92
Jharkhand	86.23	76.90	45.62	74.08	24.48	35.25	11.27	19.42
Maharashtra	94.48	90.35	70.76	67.05	21.69	54.85	14.27	34.73
Gujarat	92.32	79.92	56.47	69.47	28.50	58.34	16.72	32.69
Chhattisgarh	70.38	67.78	65.00	70.31	17.98	60.37	9.42	29.35
Madhya Pradesh	85.28	73.89	74.27	62.49	22.30	55.03	14.95	25.41
Andhra Pradesh	98.13	89.81	48.48	63.61	24.08	51.02	11.95	30.20
Karnataka	96.14	91.33	48.91	62.56	25.26	54.11	12.49	32.62
Tamil Nadu	96.30	83.18	62.34	38.42	36.30	77.06	19.32	23.78
Kerala	96.13	88.65	75.54	82.36	19.37	25.69	13.32	18.16
All India	89.68	79.45	63.23	71.46	21.35	49.20	12.33	27.31

Coverage, D index and HOI

Outcomes	Access to ANC	Quality of ANC	Access to ID	Quality of ID
Distribution of basic opportunities: Coverage				
2005-06	50.17	12.33	48.78	36.66
	[0.279]	[0.221]	[0.254]	[0.490]
2015-16	57.25	27.31	79.36	39.08
	[0.125]	[0.816]	[0.1002]	[0.159]
D-index				
2005-06	19.44	20.19	26.60	7.73
	[1.079]	[2.950]	[1.029]	[2.185]
2015-16	11.64	10.03	7.62	6.13
	[0.412]	[0.856]	[0.267]	[0.774]
Overall development: Human Opportunity Index				
2005-06	40.42	9.84	35.81	33.82
	[0.305]	[0.203]	[0.273]	[0.511]
2015-16	50.59	24.48	73.32	36.69
	[0.140]	[0.132]	[0.129]	[0.171]

Broad Results

- *HOI = Coverage (1-D)* has increased more than proportionately than just coverage.
- It may be further noted that, for access to ID, both the rise in coverage as well as the fall in D-index have been impressive, resulting in a much better value of its HOI in 2015-16 compared to that of the other three indices.
- In general, coverage and hence HOI for access to both ANC and ID have been much more than that for their quality in both the years.
- Scale effect dominated the overall changes.

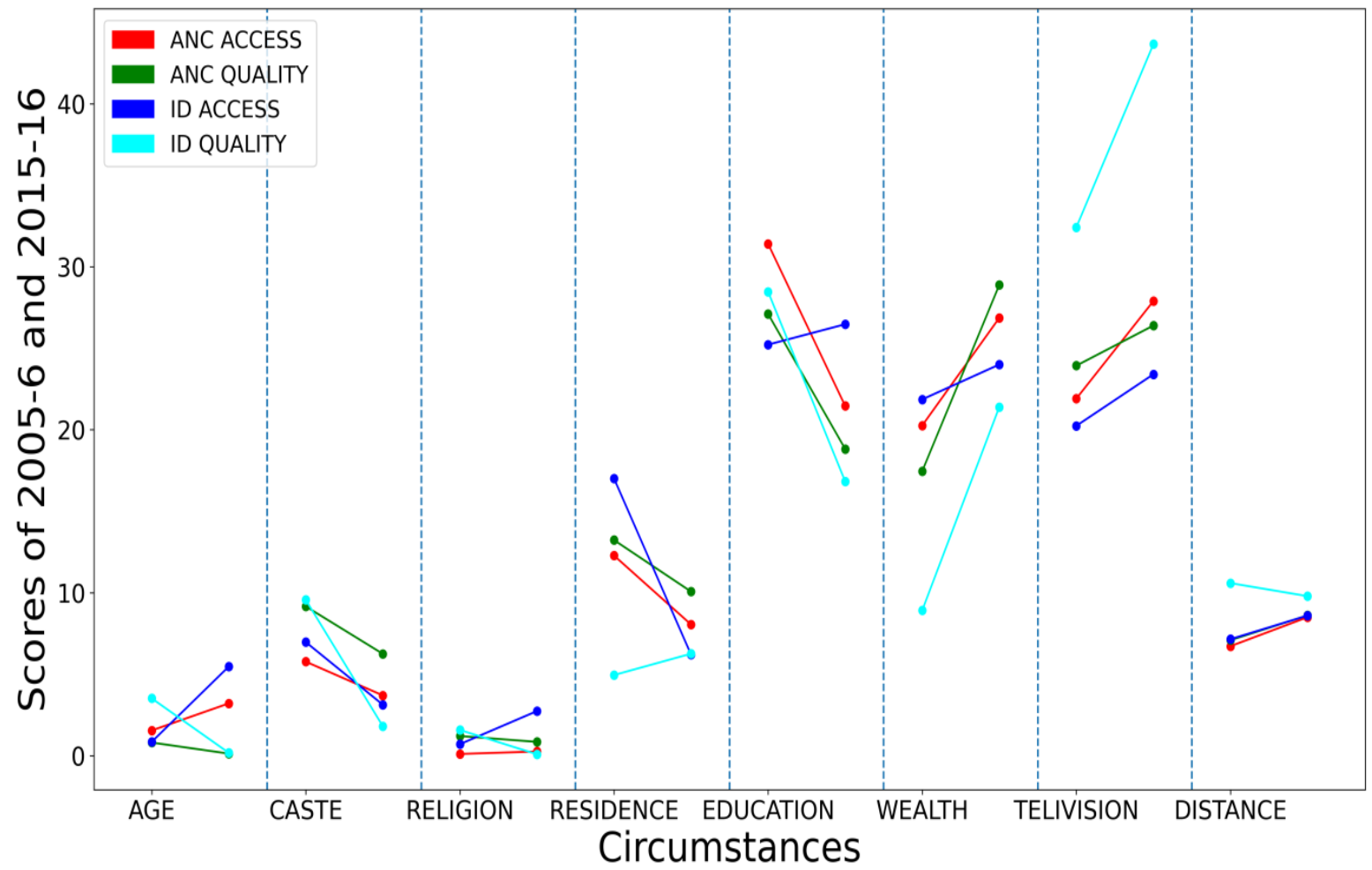
Scale effect and Distribution effect over time

Time frame: 2005-06 to 2015-16	ΔHOI	Scale effect	Distribution effect
Change in →	overall development	availability of opportunity(%)	inequality in available opportunity (%)
Access to ANC	10.16	56.07	43.93
Quality of ANC	14.64	81.66	18.34
Access to ID	37.51	59.83	40.17
Quality of ID	2.87	78.15	21.85

HOI analysis of Change in services provided by trained personnel between 2005-06 and 2015-16 (percentile points)

	Antenatal Care			Institutional Delivery		
	Coverage	D-index	HOI	Coverage	D-index	HOI
Himachal Pradesh	3.86	-2.00	5.61	-13.12	0.82	-13.60
Rajasthan	-10.15	0.65	-10.49	6.32	-3.60	9.35
Punjab	3.60	-1.52	4.78	-1.73	-0.91	-0.88
Haryana	21.29	-10.30	27.12	-5.18	-0.03	-5.09
Uttar Pradesh	-12.23	2.42	-14.12	-20.48	2.00	-21.70
Bihar	-15.96	3.46	-18.47	-2.82	-2.95	-0.65
West Bengal	-23.99	2.07	-24.74	-9.63	1.29	-10.69
Odisha	-13.85	-3.90	-10.18	-4.63	0.08	-4.59
Jharkhand	-9.41	-0.57	-8.47	-20.22	1.17	-20.88
Maharashtra	-4.14	-0.28	-3.77	2.99	-1.96	4.45
Gujarat	-12.47	2.74	-14.33	10.67	-3.00	12.91
Chhattisgarh	-2.63	-4.40	0.61	-2.13	-1.41	-0.97
Madhya Pradesh	-11.36	-2.82	-8.39	-18.54	-0.08	-18.12
Andhra Pradesh	-8.32	2.36	-10.39	3.96	-1.73	5.42
Karnataka	-4.68	0.18	-4.79	-2.23	-1.22	-1.15
Tamil Nadu	-13.11	0.40	-13.30	0.07	-0.40	0.44
Kerala	-7.38	-0.31	-7.02	10.04	-1.34	11.04
All India	-10.24	0.96	-10.65	-7.16	1.62	-8.39

Changes in marginal contribution to inequality in India in maternal health care indicators



Summary of results

- The percent of pregnant women who have access to and receive better quality of ANC and ID both increased after health care reform, though quality issues are still very disturbing.
- *D-index*, indicating the share of opportunities that must be reallocated, given the circumstances to ensure access to all, has also fallen in all cases.
- HOI, interpreted as the share of opportunities that have been allocated based on the equal opportunity principle, increased more than proportionately than just coverage.
- It may be further noted that, for access to ID both the rise in coverage as well as the fall in *D-index* has been impressive, resulting in a much better value of its HOI in 2015-16 compared to that of the other three indices.
- In general, coverage and hence HOI for access to both ANC and ID have been much more than that for their quality in both the years.

- For quality indices, the component of services received from trained personnel registered a fall in coverage and rise in D-index, whereby identifying more acute fall in HOI.
- The fall was more pronounced in populous states like UP, Bihar, West Bengal.

Summary of Decomposition results

- A decomposition of the change in HOI into scale effect and distribution effect identifies the scale effect to be the main cause of the improvement in HOI.
- The marginal contribution of the household wealth index, exposure to television and education to the inequality of opportunities were found to be biggest in majority of states.
- For all categories of castes, religion and distance to nearest health centre witnessed improvement in access to and quality of ID. The access to and quality of ANC and access to ID improved significantly for the poor, though the gap between poor and the non-poor gap still persisted.
- State-specific variations do exist for marginal contribution to inequality of opportunity as found from decompositions. Circumstances like distance to the facility caste, religion, place of residence become important components of *D-index*.

Conclusions

- Receipt of quality of health care being controlled by circumstances is a serious concern for policy makers.
- Commensurate improvement did not take place in inducting more staffs and hence a hint towards crowding effect.
- Increasing income-effect is a serious concern.
- More focus on social gradients of health care is called for.
- More integrated approach rather than just health care policies.