Progressivity of Public Spending on Health care at the Sub-state Level in India: An Empirical Investigation in Tamil Nadu and Bihar

No. 375
17-March-2022
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NIPFP

**National Institute of Public Finance and Policy
New Delhi**

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Abstract

Progressivity of public spending on health is considered welfare enhancing, and is often quantified through Benefit Incidence Analysis (BIA). In India, BIA analyses have been confined to state-level aggregates, and intra-state variation in progressivity among districts have remained largely unknown due to limited availability of disaggregated data. We use multiple datasets to overcome the data constraint and undertake BIA at the district-level in the two states of Bihar and Tamil Nadu. Disaggregated information from respective state treasuries were combined with central and state samples of surveys conducted by the National Sample Survey Organization to estimate utilisation and incidence of the benefits of public spending in districts. Results highlight that several districts diverge from state-level aggregates on progressivity, and this call for targeted heath interventions at the state-level. Further, a comparison of public spending across vertical tiers of the health pyramid and utilization of health facilities in the two states provide insights on state-level effectiveness of health interventions. The study lays forward a methodological framework to undertake BIA at the district-level in India.

Key Words: Health Financing, Benefit Incidence Analysis, Public Spending on Health, Bihar, Tamil Nadu. India

JEL Classification: H22, I14, I15, I18

Progressivity of Public Spending on Health Care at the Sub-State Level in India: An Empirical Investigation in Tamil Nadu and Bihar

Introduction

Public spending is expected to improve the distribution of economic welfare.[5] The welfare enhancing role of public spending is often measured in terms of "progressivity", the extent to which the benefits of public spending reach the poor. A proportionately higher share of benefits accruing to lower income groups of the population, indicate a progressive nature, and an effective redistributive role of public spending. The underlying rational stems from the fact that the poorer sections of the population are heavily dependent on public services due to lower ability to pay.

Empirical investigation of progressivity has been largely based on the analytical tool of Benefit-incidence analysis (BIA). The tool has been widely used by researchers to understand the distribution of benefits (or subsidies) in publicly funded health (and education) services in low- and middle-income countries (Castro-Leal 1996, Castro-Leal *et al.* 1999; Castro-Leal *et al.* 2000, Sahn and Younger 2000). The framework combines information on utilization of different types of public services with unit costs of providing those services to derive the benefits of public spending across socio-economic groups.

In India, there have been several attempts to analyse the progressivity of public spending on health in Indian states (Mahal A. *et.al.* 2000; Pearson M. 2002; Davoodi *et.al.* 2003; Chakraborty, L *et. al.* 2013; Mahal A. 2000; Bowser, D *et.al* 2000). These analyses have however, been confined to state-level aggregates, due to limited availability of disaggregated data at the sub-state (district) level. Around two-thirds of public spending on health in India is at the state-level, and identification of intra-state (district-level) variations in progressivity and health care utilization assume importance for targeted health interventions within states. This study combines multiple disaggregated datasets to derive an understanding of intra-state variations across districts in Bihar and Tamil Nadu, the two states which occupy contrasting positions in terms of health achievements in India. This is the first major attempt to undertake BIA analysis at the district level in India, and provides a methodological framework to undertake such analysis.

The choice of Tamil Nadu and Bihar is driven by the fact that the two states occupy contrasting positions. in terms of socio-economic indicators (including health): Tamil Nadu among the best and Bihar among the worst. Per capita Net State Domestic Product (NSDP) of Tamil Nadu is about

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[5] D. McIntyre and J.E Ataguba, 2010

4.5 times higher than that in Bihar. Correspondingly, poverty is much higher in Bihar than Tamil Nadu: 34 per cent *vs* 11 per cent. In health too, there is a significant divergence. Infant mortality rate (IMR) in Tamil Nadu stood at 15 *vis-a-vis* 29 in Bihar. The difference in health achievements is partially due to the gap in the level of investment on public health system in the two states. As per the National Health Accounts 2017-18, per capita government spending on health in Tamil Nadu was 3 times more than that in Bihar. Similarly, out-of-pocket spending on health care in Tamil Nadu was almost double of that in Bihar.

Data Sources and Methodological Issues

Benefit incidence analysis (BIA) requires two kinds of data, (i) public spending on health to compute costs of different types of health services provided in public facilities at an appropriate level of disaggregation and (ii) household survey data that provides information on health service utilization and measures economic status of population (users) at a matching level of disaggregation.

Information on state-level public spending is readily available from state budgets and most studies on BIA in health till date have used this source. State budgets however, do not provide district-level disaggregation of public spending, and this has constrained district-level analysis. There are similar constraints on household survey data. Studies have extensively used the survey on social consumption conducted by the National Sample Survey Office's (NSSO) for information on health service utilization and economic status of population groups for BIA analysis in India. This data is largely derived from the survey conducted by NSSO at the National level (called "central sample"), which cannot be used to derive district-level estimates, due to insufficient sample at the district-level.

To obtain district-level public spending, we use information on withdrawals from state treasuries by Drawing and Disbursing Officers (DDOs). This information was obtained from the Finance Department of the respective states. For bulk of the public spending in state budgets, withdrawals by DDOs can be identified with individual districts. Further, for classifying health spending by levels of care, we combined information on spending reported in budgets with DDO withdrawals.[6] . For health facility utilization at the district-level, we pooled the unit-level "state sample" of the 71st round of NSSO survey with unit-level information of the "central sample". It may be noted that in each NSS round, only a part of the NSSO frame is surveyed by the Field Operation Division (FOD) of NSSO and is used as the "central sample". This sample is the basis for much of the

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[6] For methodological details of such classification, refer https://www.nipfp.org.in/media/medialibrary/2020/07/WP_315_2020.pdf and https://www.nipfp.org.in/media/medialibrary/2017/07/WP_2017_199.pdf

discussions on national and state-level evidence from NSS. Notably, a "state sample" is also drawn from the residual frame of each round and is surveyed by the State Directorate of Economics and Statistics[7] (SDES) of each state. The sampling strategy and the survey tool used for the central and the state samples are the same. Although the state samples were initiated to derive disaggregated district-level estimates in each state, they have not been used widely till date, as they are not readily available in the public domain. We obtained the state samples of the 71st round (2014) survey of social consumption of health conducted by NSSO for this study from the two states, Tamil Nadu and Bihar. It may be noted that information on the utilization of health services by households pertain to the year 2014, while public spending relates to the year 2016-17, To the extent that the structure of public spending and utilization do not change over a short period of time, the results are unlikely to be affected.

In both Tamil Nadu and Bihar, an equal number of households were allotted for the state and the central sample (3917 each in Tamil Nadu and 3167 each in Bihar). The actual survey data in the state sample however, related to 3192 households in Tamil Nadu and 3152 households in Bihar. We use the central sample for deriving state-level estimates, and the pooled sample (central + state) to derive district-level estimates. Notably, the population weights for the central sample are published by NSSO, but not for state samples. We estimate the weights for the state and the pooled sample using NSSO guidelines. Further, to ensure that the central and the state samples of each state are poolable for district-level estimates, we carried out poolability tests for the key parameters used in this study. These include monthly per capita consumption expenditure (MPCE), monthly per capita out of pocket expenditure on health care, utilisation of public facilities for OP and IP care (by case and days) and, and availing secondary and tertiary level care (see Table 1). The poolability tests were carried out using NSSO guidelines.[8] Parametric (mean) test was used to test for poolability of MPCE, while non-parametric chi square tests were carried out for testing poolability of utilisation of public facilities for IP and OP care as well as utilisation of secondary and above level of public facilities. The tests indicated that with respect to MPCE, 75 per cent of the districts of Tamil Nadu and 79 per cent of Bihar were poolable, In Bihar, with respect to utilisation of public facilities for OP care, only 11 per cent of the districts are poolable. Keeping in view the low poolability on this criterion, only limited results pertaining to this have been reported. For IP care, the corresponding poolability of districts for Tamil Nadu and Bihar

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[7] States started participating in NNSO programme of collecting socio economic data since 8th round (1954-55) using the same conceptual framework, survey tool, design and frame, with the objective of generating reliable estimates at sub-state (i.e. district) level for decentralised planning.

[8]   https://www.mospi.gov.in/documents/213904/0/Manual_write_up+%281%29.pdf/0a0dfc9c-a543-287f-aad0-1b9af55fb6e3?t=1596022044616

were 72 per cent and 66 per cent respectively. Although we report results for all districts for most parameters, the results of non-poolable districts should be read with caution.

Table 1: Basic characteristics of central, state and pooled sample and tests for pool-ability

Parameters	Pool-ability test	Tamil Nadu			Bihar			Proportion of districts pool-able (per cent)	
		Central	State	Pooled	Central	State	Pooled	Tamil Nadu	Bihar
Average Monthly per-capita expenditure (MPCE)	Mean test	2072.9	1919.3	1999.7	1124.4	1244	1187.6	75	79
Average monthly per-capita out of pocket spending on health care	Mean test	253.28	173.95	215.52	129.8	38.5	81.6	97	79
Utilisation for Public facilities for IP care (by number of cases) (per cent)	Chi²test	39	52	45	55	48	51	72	66
Utilisation for Public facilities for IP care (by number days)) (per cent)	Chi²test	45	50	47	40	38	39		
Utilisation for Public facilities for OP care) (per cent	Chi²test	35	34	34	14	33	15	44	11
Utilisation of Secondary and above level of public facilities (IP)) (per cent)	Chi²test	95	73	83	79	67	73	69	31
Utilisation of Secondary and above level of public facilities (OP)) (per cent	Chi²test	80	65	74				45	
Source: Own estimates using central, state and pooled sample									

Estimation of Unit Costs and Benefits Received

Using NSSO pooled data, we obtained utilisation of public facilities (primary, secondary and above) by tertile expenditure groups for availing IP and OP care. Using these three matrices and assuming that the cost of one IP day is equivalent to three OP visits (following Chatterjee *et.al.*, 2013), we estimated the benefits obtained by people of different expenditure groups for IP and OP at different levels of public facilities (Primary, secondary and above).[9] We clubbed public facilities above primary into a single group as the NSSO survey questionnaire, does not facilitate separate identification of secondary and tertiary level public facilities. Algebraically, the estimation method can be explained as follows:

Let
E_j = Government expenditure at the jth level of facility (Primary/Secondary and above)

U_{ij} = Use of ith care (IP/OP) at the jth level of facility (Primary/Secondary and above) in days. U_{ijg} = Use of ith care (IP/OP) at the jth level of facilities (Primary/Secondary and above) in days, for the gth tertile group of income/expenditure.

Assuming, the cost of one IP day equivalent to k number of OP visits, where k=3[10]

Unit cost of availing care at Primary facility in terms of IP days = $E_1/[(U(IP)_1 + U(OP)_1/k]$
Unit cost of availing care at secondary and above level facility in terms of IP days = $E_2/[(U(IP)_2 + U(OP)_2/k]$

Hence,
   i. Benefits to population tertile group g, for availing IP care in Primary level facility =$[E_1/((U(IP)_1 + U(OP)_1/k)]*U(IP)_{1g}$
   ii. Benefits to population tertile group g, for availing OP care in Primary level facility =$[E_1/((U(IP)_1 + U(OP)_1/k)]*U(OP)_{1g}$
   iii. Benefits to population tertile group g, for availing IP care in Secondary and above level facility = $[E_2/((U(IP)_2 + U(OP)_2/k)]*U(IP)_{2g}$
   iv. Benefits to population tertile group g, for availing OP care in Secondary and above level facility = $[E_2/((U(IP)_2 + U(OP)_2/k)]*U(OP)_{2g}$

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[9] Primary level public health facilities include HSC, ANM, ASHA, AWW, PHC, dispensary, CHC and mobile medical units)

[10] Following the costing exercise done by Chatterjee et.al. (2013), we assume that the cost of one IP day is equivalent to three OP visits at any level of facility (i.e., k=3)

Public spending and Utilization of Public Facilities in Tamil Nadu and Bihar

In Bihar, bulk of the public spending on health care is incurred at the level of primary facilities (65 per cent), while in Tamil Nadu, the majority (58 per cent) is incurred at secondary and tertiary level facilities (Figure 1).[11] The relatively high share of public spending on secondary and tertiary care facilities in Tamil Nadu, is driven by the fact that bulk of the public services in Tamil Nadu is provided at higher level facilities. As per the 71st round of NSSO survey in 2014, even in rural areas, about 73 per cent of outpatient services in Tamil Nadu are provided by facilities above the level of Community Health Centres (CHCs). In per capita terms however, spending in primary level facilities was higher in Tamil Nadu than Bihar. The low level of per capita availability of primary level facilities in Bihar (Sub centre, PHC and CHCs) is partially responsible for this. In Bihar, there were about 115 primary level public facilities per million population, as compared to 146 in Tamil Nadu.[12]

Figure 1: Distribution of public spending on health care by type of facility
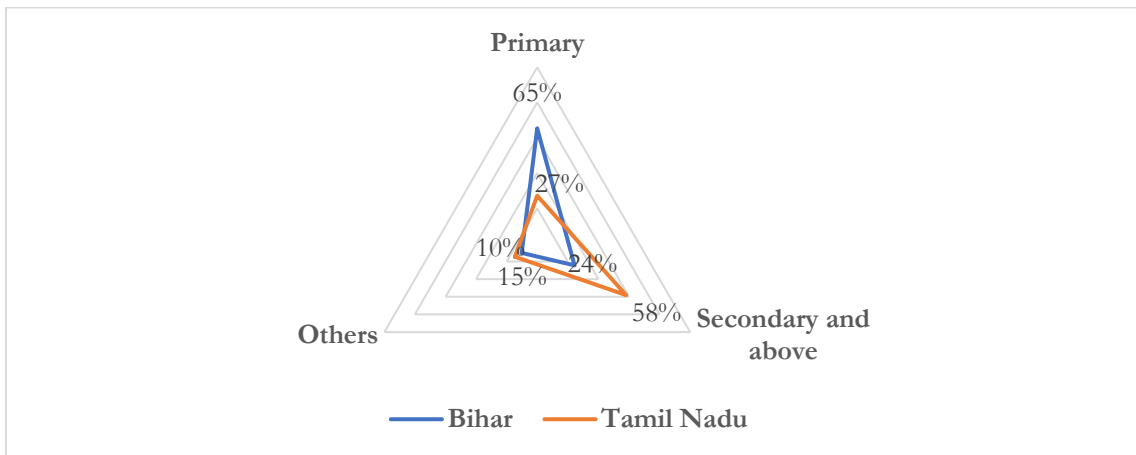
Source: Estimations based on withdrawals by Drawing and Disbursing officer (DDO) in the state health department of Bihar and Tamil Nadu, 2014-15.

The preference for public facility for health care is also low in Bihar as compared to Tamil Nadu (Table 3). As per NFHS 2015-16, about 63 percent of people generally accessed government hospitals when sick as compared to 22 per cent in Bihar. This is also mirrored in the 71st round of NSSO survey in 2014 (Table 3). For OP visits, about 35 per cent in Tamil Nadu used public facilities *vis-a-vis* 14 per cent in Bihar. For inpatients, the proportion of people using public facilities were higher in Bihar than in Tamil Nadu. This is possibly due to the fact that the

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[11] 10 per cent and 15 per cent of total government spending of Bihar and Tamil Nadu, could not disaggregated by type of facility
Choudhury and Dubey 2020, https://www.nipfp.org.in/media/medialibrary/2020/07/WP_315_2020.pdf
[12] Numbers of public facilities are taken from Rural Health Statistics -2018.

availability of private hospitals in Bihar is lower than that of Tamil Nadu, as people's ability to pay is relatively high in the latter (Choudhury and Datta 2019).

Table 2: Preference for public facilities for health care in Tamil Nadu and Bihar

|	Preference for Public facilities (per cent)			
	IP (visits)	IP (Days)	OP (Visits)	Any (Visits)
TAMIL NADU				
Poorest	59	64	49	52
Middle Income	36	42	38	38
Richest	22	31	20	21
Tamil Nadu (all income class)	**39**	**45**	**35**	**36**
BIHAR				
Poorest	62	36	6	31
Middle Income	58	46	14	38
Richest	46	39	23	35
Bihar (all income class)	**55**	**40**	**14**	**34**

Source: Own estimation using NSSO 71st Round Survey data (Central Sample)

Utilization of public facilities are also different in Bihar as compared to Tamil Nadu. In Tamil Nadu, 31 per cent of visits in public health facilities are for IP care. Whereas in Bihar 80 per cent of visits in public health facilities are for IP care (Figure 2). The free medicine initiative in Tamil Nadu for OP care may have contributed to this. In the category of the poor, 88 per cent of visits in public health facilities in Bihar are for IP care. In contrast, in Tamil Nadu, 75 per cent of total visits in public health facilities are for OP care. Notably, unlike Bihar, public health facilities in Tamil Nadu are utilised more by the poorer sections of the population for both IP and OP care (Figure 3)

Figure 2: Intensity of use of public facilities for IP care (per cent)
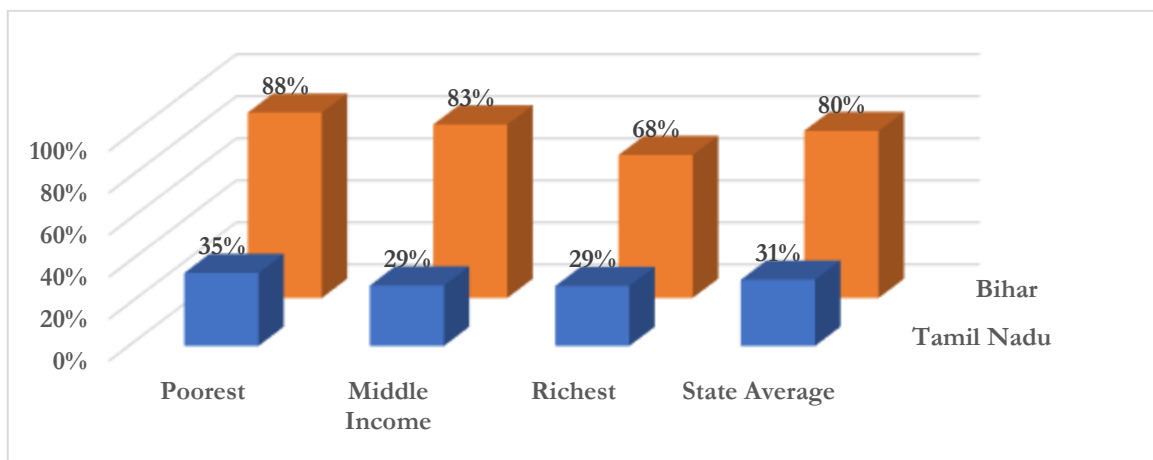
Source: Own estimation using NSSO 71st Round Survey data (Central Sample)

Figure 3: Utilisation of Public facilities for health care in Bihar and Tamil Nadu
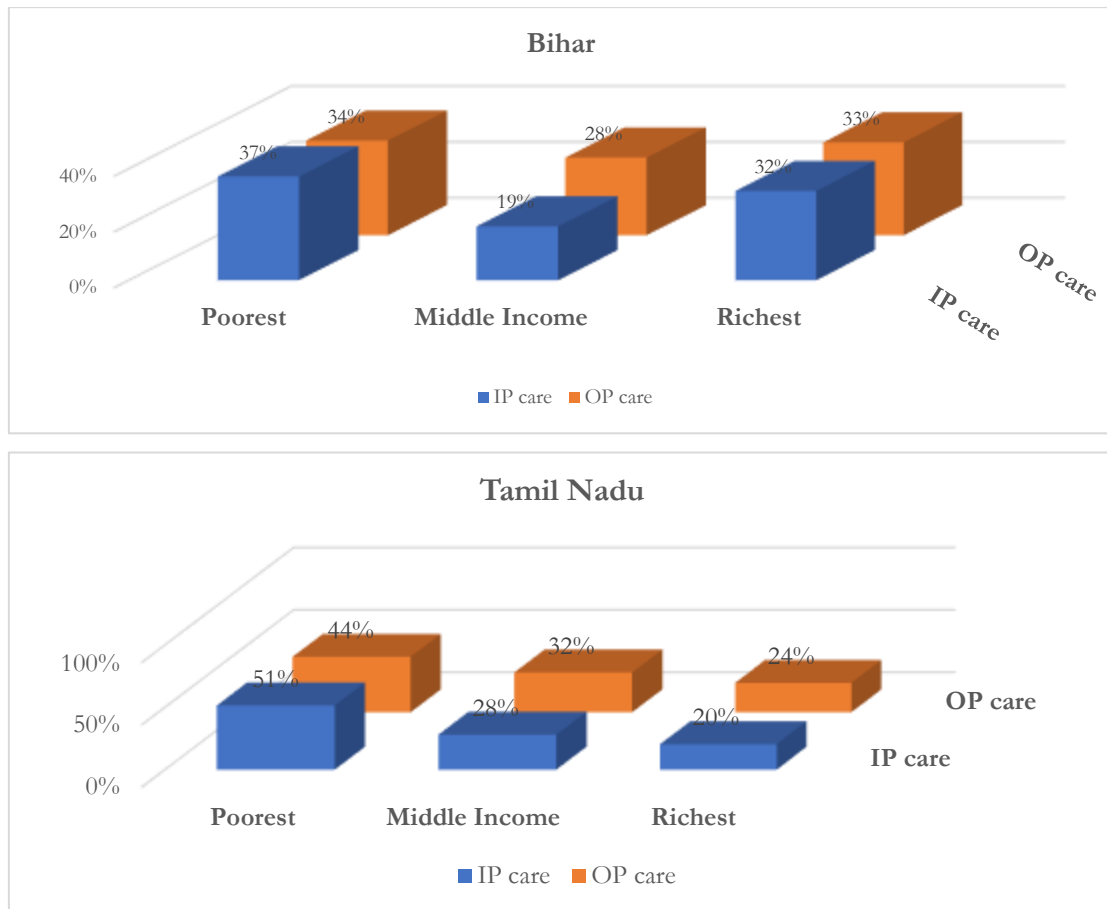
Source: Own estimation using NSSO 71st Round Survey data (Central Sample)

State level Benefit-incidence analysis

Figure 4 and 5 show concentration curves for utilization and benefits from public health facilities. Concentration curves are said to be progressive in relative terms, if poor population groups receive more benefit than richer groups. In other words, for progressive distribution of the benefit, concentration curves lie above the line of equality (45° line).

Fig. 4 shows concentration curves for utilisation of public facilities in Tamil Nadu and Bihar for Inpatient (IP) and outpatient (OP) care. The curves depict the cumulative sum of utilisation of public facilities for availing IP (days) and OP (visits) care over the tertile groups[13] of the population, ranked by MPCE[14]. For both IP and OP, utilisation of public facilities are pro-poor in Tamil Nadu. It also shows that utilisation of primary as well as higher (secondary and above) public facilities for availing IP and OP care is pro-poor in Tamil Nadu. In contrast, in Bihar,

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[13] It divides an ordered distribution into three parts, each containing a third of the population.
[14] Monthly per capita consumption expenditure

utilisation of public facilities for IP and OP care are pro-rich. In Bihar, only utilisation of primary level public facilities for IP care indicate a pro-poor pattern.

Figure 4: Utilisation of public facilities for health care
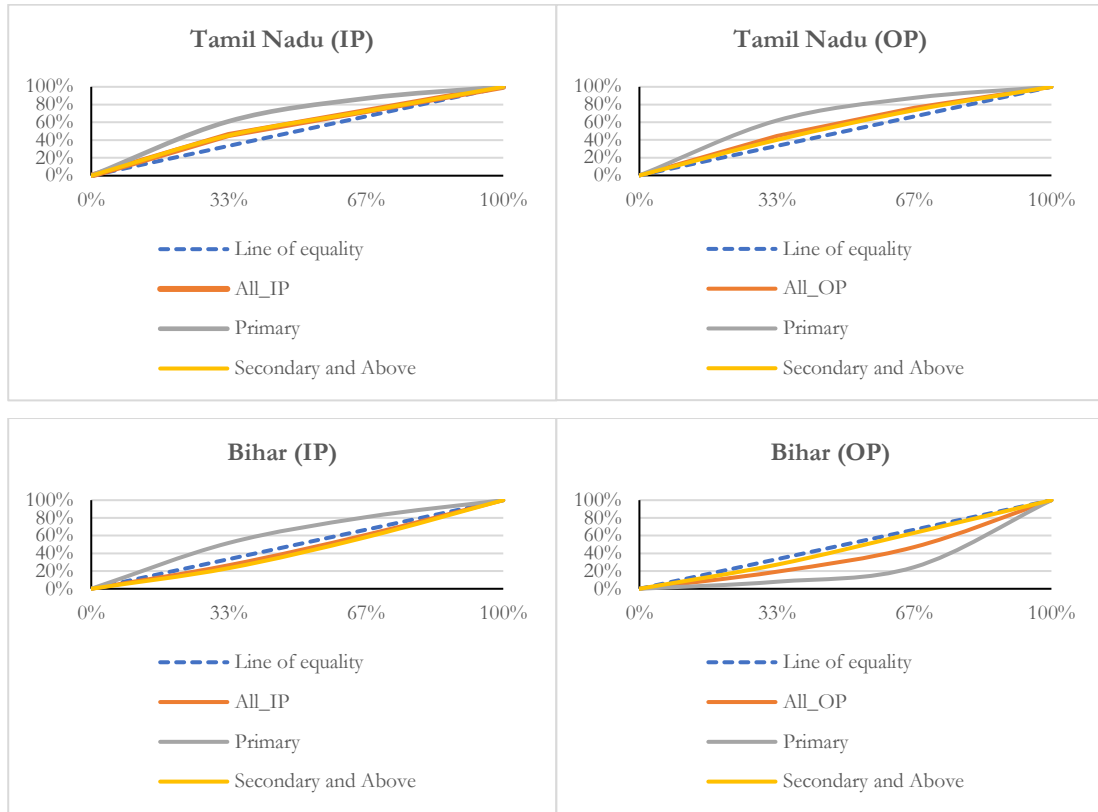
Source: Own estimation using NSSO 71st Round Survey data (Central Sample)

Figure 5: Net Benefits of public expenditure on health care
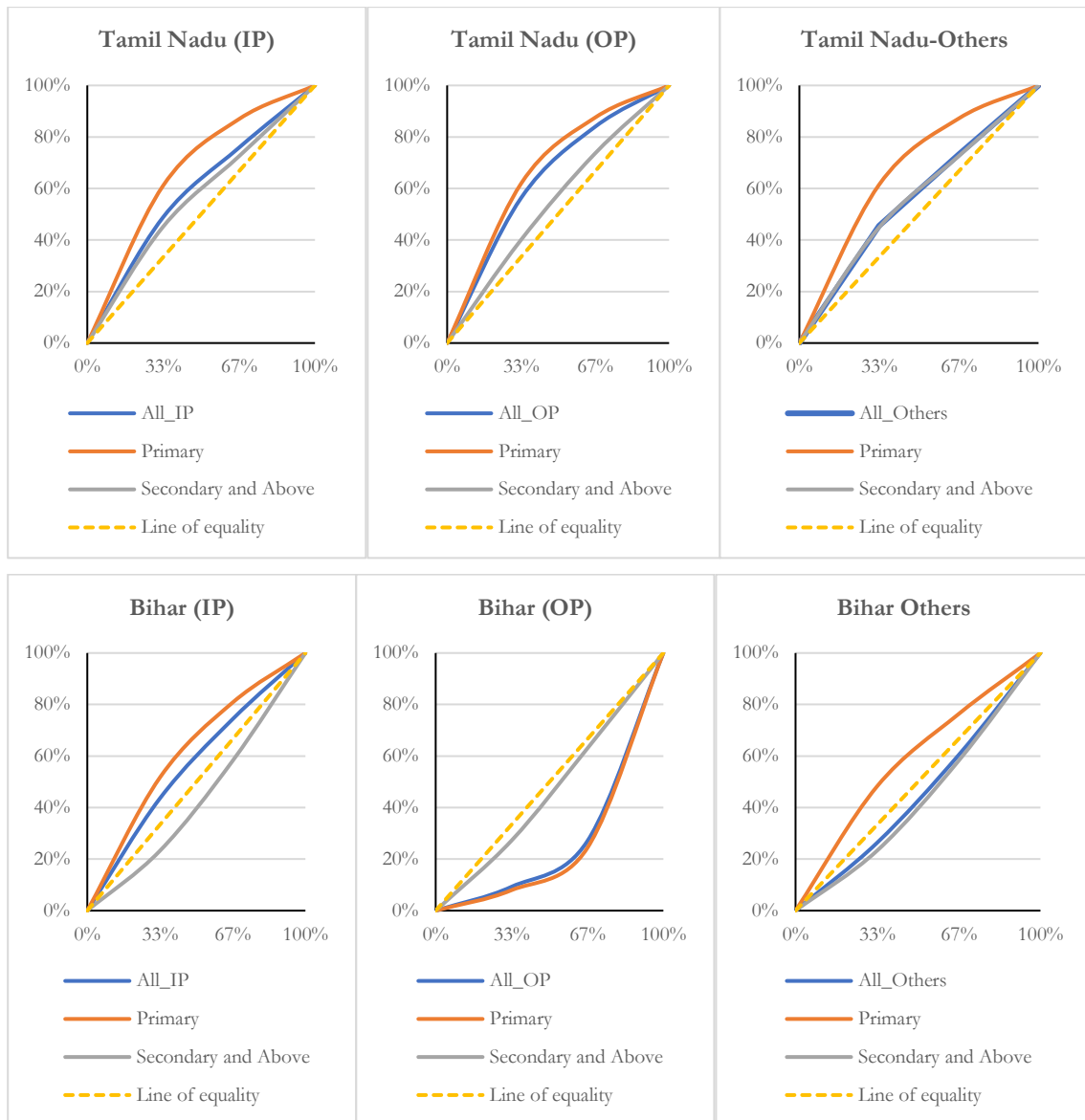
Source: Own estimation using NSSO 71st Round Survey data (Central Sample)

Figure 5 displays cumulative distribution of net benefits across income classes for using public health facilities. Public expenditure figures were estimated using DDO level information, and each line entry in DDO has been further classified by level of care (i.e. Primary and Secondary and above).[15] Figure 2 showed that for both IP and OP use, net benefits were pro-poor in Tamil Nadu for all level of facility (i.e., primary, secondary and above). In fact, net benefits of IP and OP care at primary level health facility were most pro-poor in Tamil Nadu. On the other hand, in Bihar, net benefits from utilisation of public facilities for OP care were strictly pro-rich. Notably

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[15] Unclassified part was categorized as others. It was assumed that other expenditures were utilised by all users of public health facilities.

however, net benefits from utilisation of public facilities (primary level) for IP care is pro-poor in Bihar.

District Level Benefit-incidence analysis

District-level results show that there are large variations across districts in both Tamil Nadu and Bihar in both utilization and benefit-incidence. Figure 6 displays the concentration indices across districts in Bihar for utilisation of public facilities for IP care. Negative value of the index indicates pro-poor utilisation of public facilities. Seven out of thirteen poolable districts (55 per cent) have pro-rich (positive) utilization for IP care. There are large variations across districts in utilization for IP care in primary level public facility. Only one among the thirteen poolable districts and 10 among all districts displayed pro-poor utilization pattern for IP care availed in primary level health facilities. Similarly, 7 among the poolable districts and 18 among all districts exhibited pro-poor utilization for IP care above primary level public facilities in Bihar.
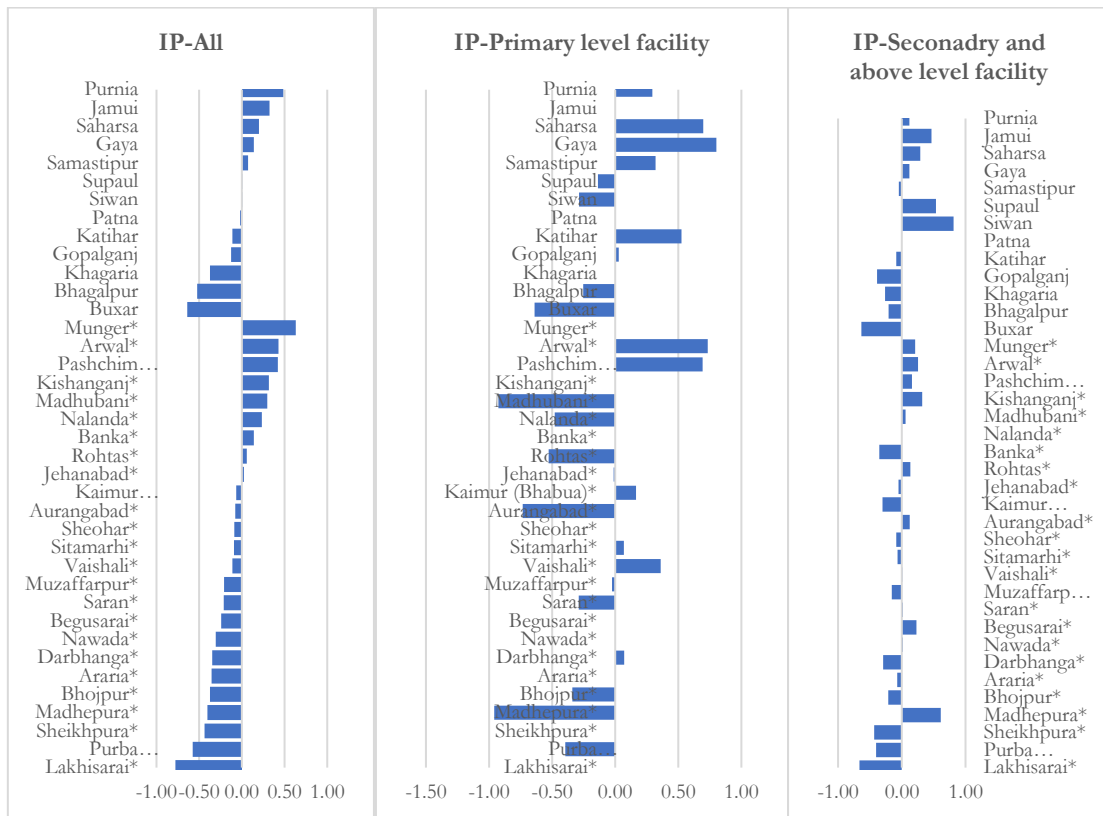
Figure 6: District-wise Concentration Indices for utilization of different levels of public facilities for inpatient treatment (IP) in Bihar
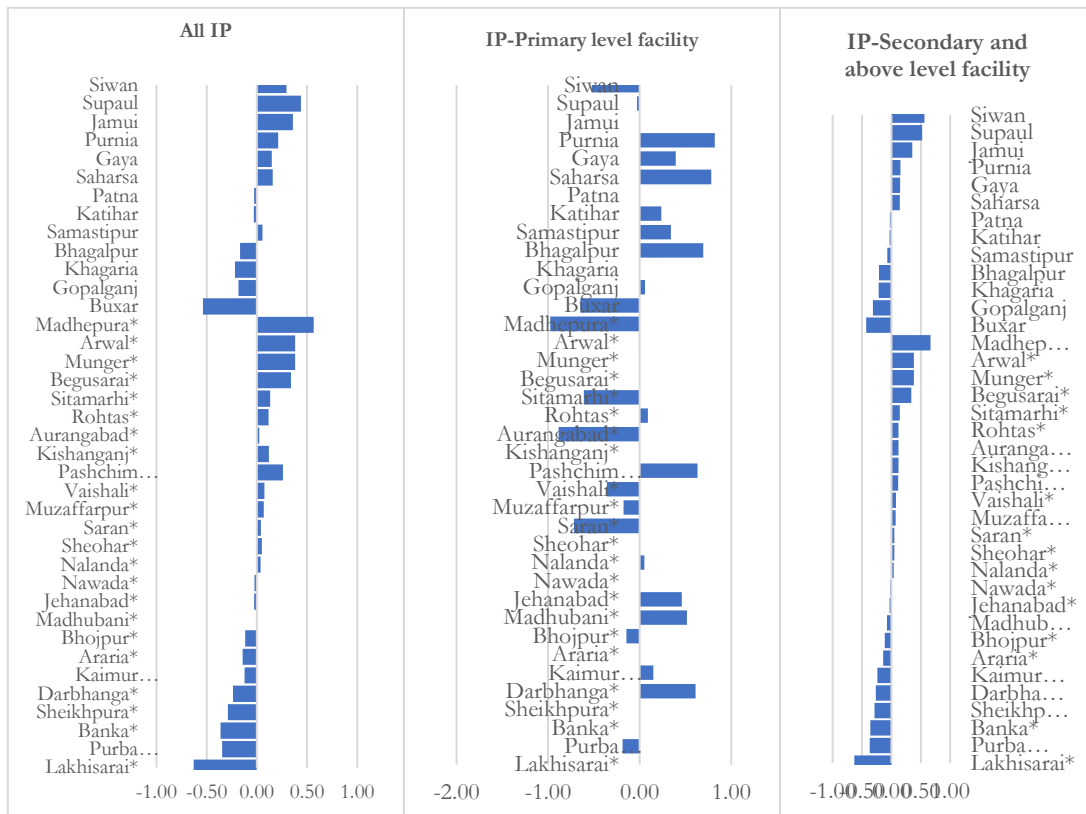
Note: * Central and state samples are poolable for these districts (satisfies tests on poolability)
Source: Own estimation using NSSO 71st round pooled data (Bihar)

Figure 7: District-wise Concentration Indices for net public benefits at different levels of public facilities for IP care in Bihar
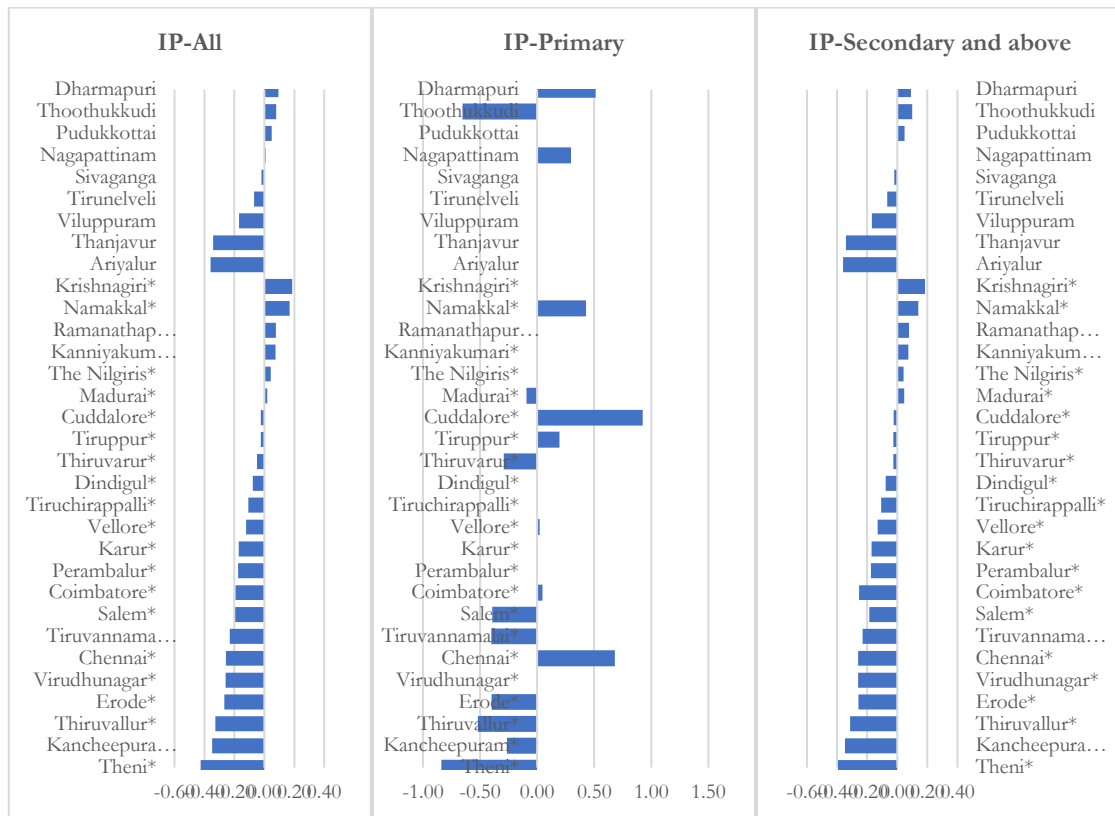

Note: * Central and state samples are poolable for these districts (satisfies tests on poolability)
Source: Own estimation using NSSO 71st round pooled data (Bihar)

Figure 7 displays concentration indices for net benefits across districts in Bihar for availing IP care in public facilities. Overall 36 per cent (14 out of 38) districts in Bihar exhibit pro-rich pattern in terms of benefits received from public health facilities for IP care. Only five of the thirteen poolable districts show pro-rich pattern with respect to benefits received from public health facilities for IP care. On the whole, 29 per cent and 39 per cent districts in Bihar showed pro-rich pattern for benefits received for IP care at primary and above primary- level public facilities respectively.

For OP care in public facilities only 11 per cent districts were found poolable in Bihar, and therefore, district level analysis for OP care was not carried out.

Figure 8: District-wise Concentration Indices for utilization of different levels of public facilities for inpatient treatment (IP) in Tamil Nadu
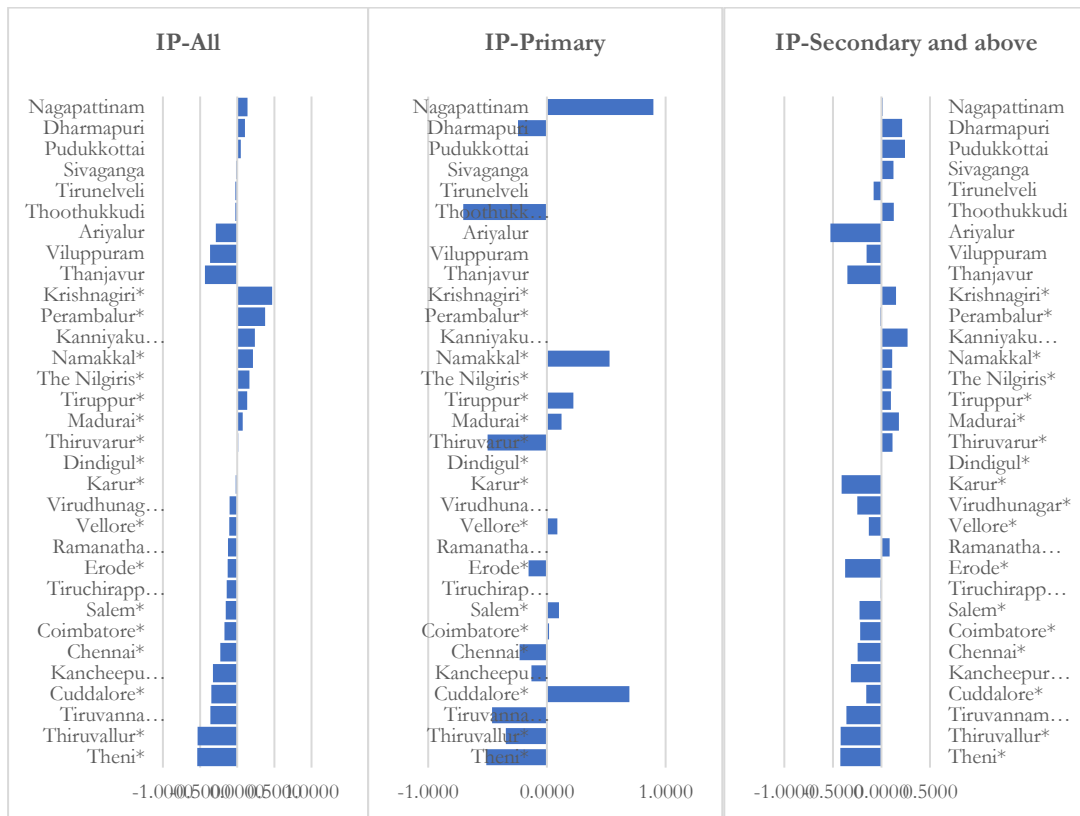

Note: * Central and state samples were poolable for these districts (satisfies tests on poolability)
Source: Own estimation using NSSO 71st round pooled data (Tamil Nadu)

Figure 8 and 9 display concentration indices across districts of Tamil Nadu for utilisation and benefits from public facilities for IP care. Figure 8 shows that utilisation pattern of public facilities for IP care is pro-poor both at primary as well as higher levels.

Figure 9: District-wise Concentration Indices for net public benefits at different levels of public facilities for IP care in Tamil Nadu
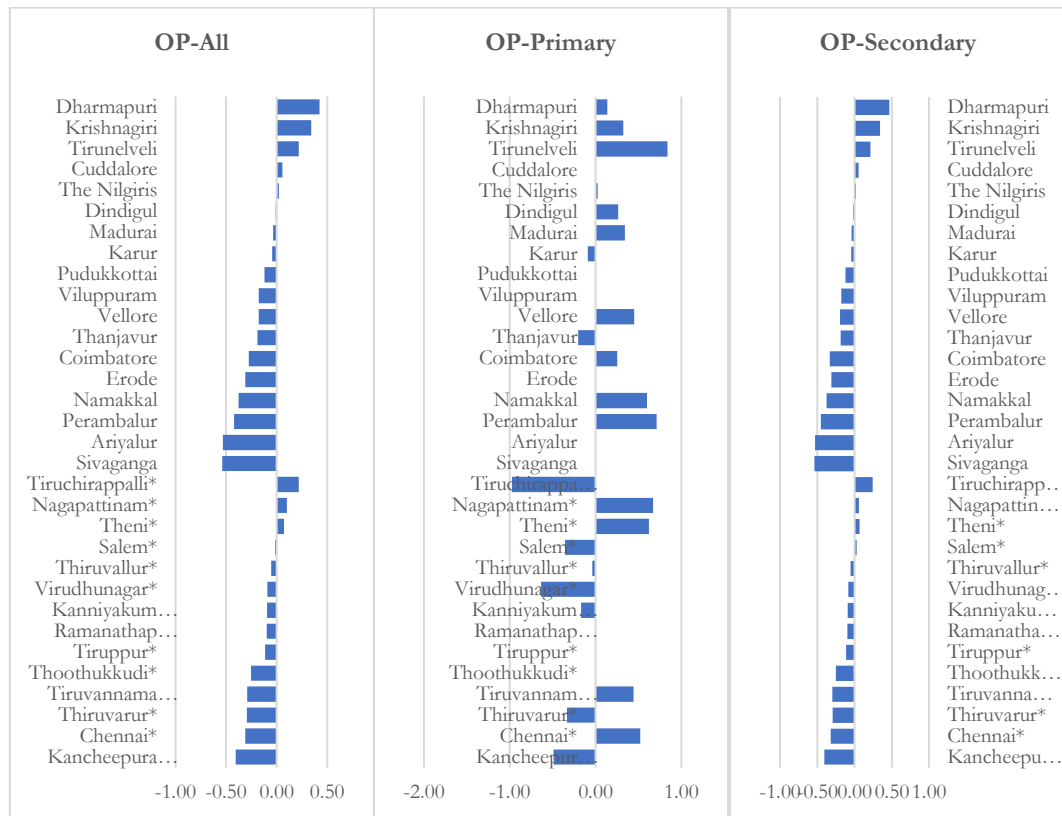

Note: * Central and state samples were poolable for these districts (satisfies tests on poolability)
Source: Own estimation using NSSO 71st round pooled data (Tamil Nadu)

Figure 9 shows that the benefits from utilisation of public facilities for IP care in majority of the districts of Tamil Nadu is pro-poor for both primary as well as higher level public facilities.

Figure 10: District-wise concentration Indices for utilization of different levels of public facilities for OP treatment in Tamil Nadu
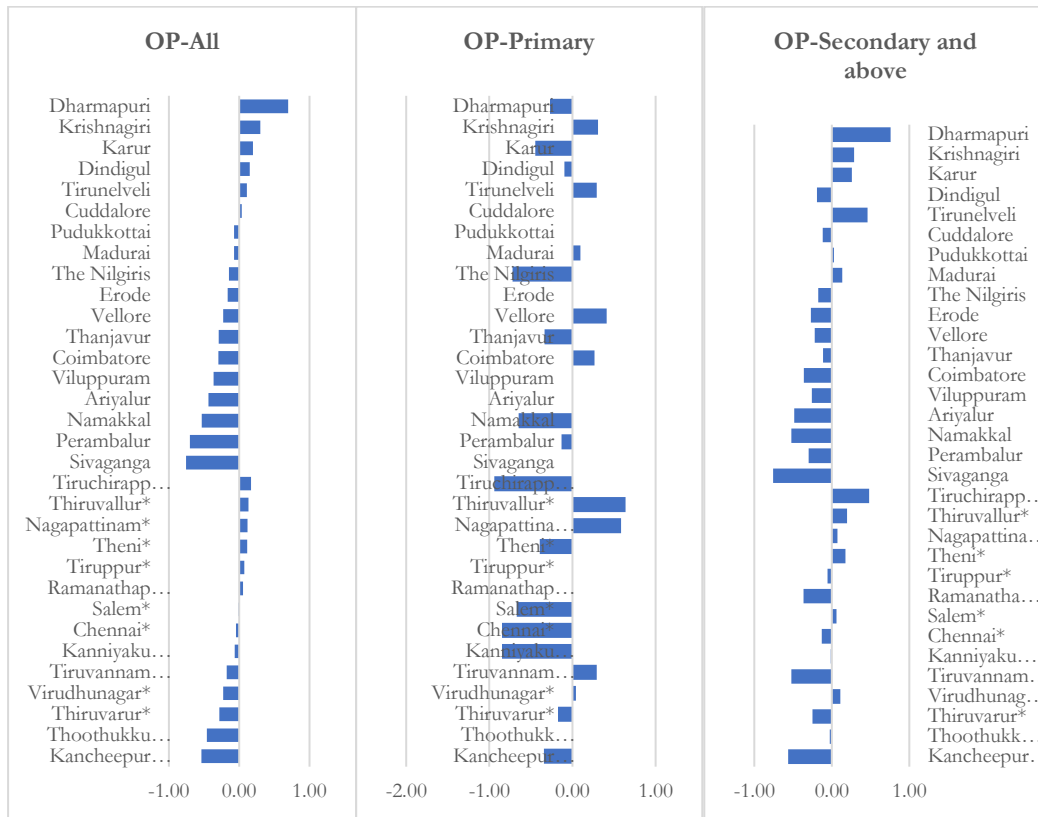

Note: * Central and state samples were poolable for these districts (satisfies tests on poolability)

Source: Own estimation using NSSO 71st round pooled data (Tamil Nadu)

Figure 10 shows district-wise concentration indices and utilization of public facilities for OP treatment in Tamil Nadu. For most districts of Tamil Nadu it is pro-poor. Pro-poor trend in utilisation of public facilities for OP care holds good at both primary as well as higher levels of public facilities in majority of districts of Tamil Nadu. Trend in incidence of benefits from utilisation of public facilities for OP care at all levels is also pro-poor in majority of the districts of Tamil Nadu (Figure 11).

Figure 11: District-wise concentration indices for benefits (net) from different levels of public facilities for OP care in Tamil Nadu

Note: *Central and state samples were poolable for these districts (satisfies tests on poolability)
Source: Own estimation using NSSO 71st round pooled data (Tamil Nadu)

Table 2: Distribution of benefits for availing IP care in public facilities in districts of Bihar

	Pro-poor (22)	Pro-rich (16)
Not Poolable (13)	Patna, Katihar, Katihar, Bhagalpur, Gopalganj, Gopalganj, Khagaria, Buxar	Supaul, Jamui, Siwan, Purnia, Saharsa, Gaya, Samastipur
Poolable (25)	Kaimur(Bhabua), Aurangabad, Sheohar, Sitamarhi, Vaishali, Muzaffarpur, Saran, Begusarai, Nawada,Darbhanga, Araria, Bhojpur, Madhepura, Sheikhpura, Purba Champaran, Lakhisarai	Munger, Arwal, Pashchim Champaran, Kishanganj, Madhubani, Nalanda, Banka, Rohtas, Jehanabad, Siwan

In Bihar, around two-thirds of the districts (25 out of 38) had reliable pooled samples for IP care (Table 2). Of these, nearly half were pro-rich, which resonates with overall state-level aggregates.

These districts need targeted interventions. Notably however, there are a number of districts which deviate from the overall state-level patterns, and these highlight the need for sub-state analysis.

Table 3: Distribution of benefits for availing IP care in public facilities in Districts of Tamil Nadu

	Pro-poor (20)	Pro-rich (12)
Not Poolable (9)	Sivaganga, Tirunelveli, Thoothukkudi, Ariyalur, Viluppuram, Thanjavur	Nagapattinam, Dharmapuri, Pudukkottai
Poolable (23)	Karur, Virudhunagar, Vellore, Ramanathapuram, Erode, Tiruchirappalli, Salem, Coimbatore, Chennai, Kancheepuram, Cuddalore, Tiruvannamalai, Thiruvallur, Theni	Krishnagiri, Perambalur, Kanniyakumari, Namakkal, The Nilgiris, Tiruppur, Madurai, Thiruvarur, Dindigul

Table 4: Distribution of benefits for availing OP care in public facilities in Districts of Tamil Nadu

	Pro-poor (20)	Pro-rich (12)
Not Poolable (9)	Pudukkottai, Madurai, The Nilgiris, Erode, Vellore, Thanjavur, Coimbatore,Viluppuram, Ariyalur, Namakkal, Perambalur, Sivaganga	Dharmapuri, Krishnagiri, Karur, Dindigul, Tirunelveli, Cuddalore
Poolable (23)	Salem, Chennai, Kanniyakumari, Tiruvannamalai, Virudhunagar, Thiruvarur, Thoothukkudi, Kancheepuram	Tiruchirappalli, Thiruvallur, Nagapattinam, Theni, Tiruppur, Ramanathapuram

District-level BIA analysis in Tamil Nadu for IP care shows that although the overall state-level pattern of benefit incidence is pro-poor, there are districts which are pro-rich (Table 3). 9 of the 23 poolable districts of the state were pro-rich. These pockets of pro-rich areas call for a review. Similarly, for OP care, specific interventions may be required in the districts of Tiruchirappalli, Thiruvallur, Nagapattinam, Theni, Tiruppur, Ramanathapuram (Table 4).

Summary and Conclusions

One of the parameters for assessing effectiveness of public spending is its progressivity, and is often empirically quantified through benefit incidence analysis (BIA). Much of the BIA analysis for public spending on health in India has been confined to state-level aggregates and inter-district variation within States are unknown. Lack of detailed disaggregated data has been a major constraint for district-level analysis. We combine data on DDO withdrawals from State treasuries

(for district-level public spending) with central and state samples of the 71st round of NSS surveys to overcome the data constraint and lay out a methodological framework for undertaking district-level benefit incidence analysis for health in India. Specifically, we carry out BIA at the district-level in Tamil Nadu and Bihar, to highlight sub-state variations and the methodological framework.

Our analysis suggests that district-level BIA can highlight pockets of pro-rich areas within States for both inpatient and outpatient care, and facilitate targeted interventions. Results indicate that for IP care in Bihar, districts like Munger, Arwal, Pashchim Champaran, Kishanganj, Madhubani, Nalanda, Banka, Rohtas, Jehanabad, Siwan are significantly pro-rich than others, and call for focussed interventions. Similarly, in Tamil Nadu, for both OP and IP care, although the overall distribution of the benefits of public spending in the state is pro-poor, there are a number of pro-rich districts, which call for review. For IP care, Krishnagiri, Perambalur, Kanniyakumari, Namakkal, The Nilgiris, Tiruppur, Madurai, Thiruvarur and Dindigul call for attention of policy makers. For OP care, the districts of Tiruchirappalli, Thiruvallur, Nagapattinam, Theni, Tiruppur and Ramanathapuram are pro-rich. The analysis also suggests that there are other pro-rich districts within each state, but the results of those districts need to be read with caution, as the pooling tests were not statistically satisfactory in those districts.

Benefit incidence analysis by different levels of care indicate that in Bihar, utilisation of primary level public facilities for IP care is pro-poor, unlike OP care. Interestingly, while 65 per cent of public spending on health in Bihar is incurred at the primary level, utilization is largely concentrated at the level of secondary and tertiary care. Around 88 per cent of IP care (in days) and 59 per cent of OP visits in public health system are in secondary and tertiary level facilities in Bihar. This is unlike Tamil Nadu, where public spending at secondary and tertiary level health facilities is broadly commensurate with the utilization pattern. This calls for a review of the public spending on health *vis-à-vis* utilization at primary level facilities in Bihar.

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