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Inequality in Health Care Sector in India: A case Study of Health Facility, Human Resources for Health and Amenities Distribution at the District level in Four Indian States.

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Abstract

Across nations, National Health Policies, including that of India, have emphasised a preference for equitable health care facilities. Keeping these emphases on equity in mind we explored four Indian states using sub-state level (or district level) data. We applied mainly, three well established indicators, namely Gini coefficient and Thiel's T and L indices to gauge magnitudes of inequity. Using individual state level aggregate data, we compared our results between two periods for the same state which included one high income and another low income Indian state. Also we compared across four states, namely, Punjab, Karnataka, Madhya Pradesh and West Bengal using the most recent information available for the year. Our results indicate that government investment in three tier health facilities expansion comprising of primary, secondary and tertiary level care, has indeed resulted in low inequities in terms of health facilities availability and distribution. However, private health facilities or certain specific public health facilities did not seem to be much equitable particularly at the sub-state level. The focus of our results are on availability as it relates to geographical distribution and did not indicate equitable utilisation of health care facilities or health care outcomes at the district levels.

Keywords: Gini Coefficient, Inequality National Health, Theil Entropy

Introduction

Health care inequalities are considered to be unfair. It is presumed that differences in people's health care access and utilization across different population groups are avoidable by proper health policies. Preference for equity is emphasised in most of the health policy documents of different countries. In India, for instance, the National Health Policy 2015 [1] has mentioned that there is a mismatch between the health system's ability to guarantee access to health services to those in greatest need. Being a merit public good, basic health care facility should be available to all despite differences in socio-economic differences. The National Health Policy of 1983 and 2003 reiterates the issues on equity. The major impetus globally for equity came through the World Health Organization (WHO) in 1985 by highlighting differences across different continents [2]

In this paper we deal with inter and intra state dimensions of health care inequalities in India. The following section provides brief review of relevant studies carried out in different countries including India. This is followed by a description of our methodology and data bases used. Sections 4, 5 and 6 provide our analysis relating to different dimensions of equity mainly in terms of access and utilization and distribution of health facilities. Conclusions and policy implications are discussed in the last section.

Inequity in healthcare can be considered in terms of three main variables, namely health related outcomes, service use and finance [3-5]. These variables provide a view to evaluate health system inequity. Various ways in which inequity is focused include age, gender standardized health inequality, socioeconomic variation, etc. Inequity in health use between people with the same healthcare needs is known as horizontal inequity [6]. For health financing, measures like catastrophic health payment and health payment-induced poverty are used [7]. Different methods have been used to quantify inequity. Mostly these have been based on concentration index (CI). These are being widely used by international organizations, government bodies, and academic institutions to measure equity in health and healthcare [8-10]. Advantage of an approach using CI lies in Concentration Curve, which gives an easy visual of the distribution across income groups pertaining to health related variable. Among studies for countries other than India one could, for instance include studies relating to European, American, Canadian, Australian or New Zealand context [8, 11-21]. In the context of Asian continent one could also mention a notable number of studies [22-31]. Among others, these studies have focused on different dimensions including regions, socio-economic criteria, access, utilization, finance and methodological issues.

Methods

There are as many as ten measures of inequity which can be used. These include relative Mean Deviation, coefficient of variation, Standard Deviation of Logs, Gini Coefficient, Mehran Measure, Piesch Measure, Kakwani Measure, Theil Entropy Measure and Theil Mean Log Deviation Measure and Erreyger index [7]. From time to time, there are some modifications suggested and applied by researchers to account for income or socio-economic status. However, among these popular indicators remain Lorentz curves and Gini coefficient or its modifications. The major disadvantages of Gini coefficient is its shortcoming that the within group component cannot be neatly added to the between group component. This weakness of Gini coefficient is overcome by the entropy based measures of inequality which are known as Theil's T and L coefficients. In this paper, we use two main indicators of inequity which include Gini index and Theil's T and L measures.

The most widely used single measure of inequality is the Gini coefficient. It is based on the Lorenz curve, a cumulative frequency curve that compares the distribution of a specific variable (for example, income) with the uniform distribution that represents equality. To construct the Gini coefficient, plot the graph of the cumulative percentage of households (from poor to rich) on the horizontal axis and the cumulative percentage of expenditure (or health expenditure or household income) on the vertical axis. The Lorenz curve is shown in Figure1. The diagonal line represents perfect equality. The Gini coefficient is defined as A/ (A + B), where A and B are the areas shown in the figure. If A = 0, the Gini coefficient becomes 0, which means perfect equality, whereas if B = 0, the Gini coefficient becomes 1, which means complete inequality. In this example, the Gini coefficient is about 0.35. If we multiply this number by 100, in which case it would be reported as 35. Formally, let x_i be a point on the x-axis, and y_i a point on the y-axis. Then

$$Gini = 1 - \sum_{i=1}^{N} (x_i - x_{i-1})(y_i - y_{i-1}) \qquad (1)$$

When there are N equal intervals on the x-axis, equation (1) simplifies to

$$Gini = 1 - 1/N \sum_{i=1}^{N} (y_i - y_{i-1}) \qquad (2)$$

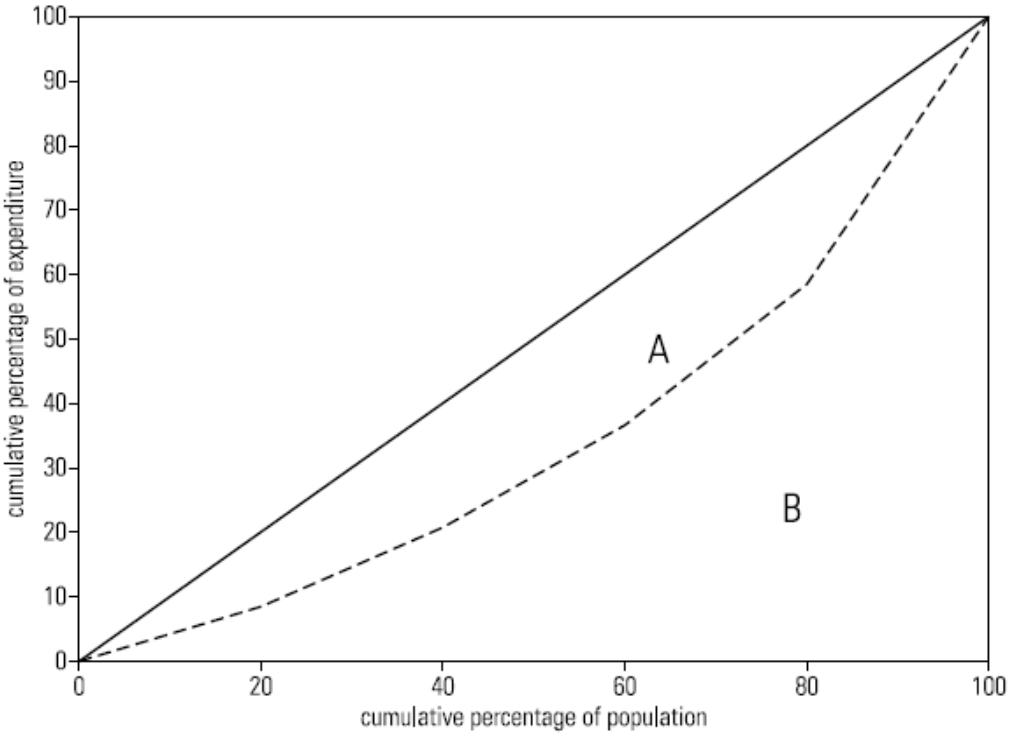

Figure 1: Lorentz curve and Gini Coefficient: Source: Haughton and Khandker [32]

The Gini coefficient is not entirely satisfactory. Although it does satisfy some of the criteria that makes a good measure of income inequality. The Gini index is not easily decomposable or additive across groups or the total Gini of society is not equal to the sum of the Gini coefficients of its subgroups. In the latter (namely statistical testability) one should be able to test for the significance of changes in the index over time. Partly this problem is overcome by confidence intervals and it can typically be generated using bootstrap techniques.

Generalized Entropy Measures (Theil's T and L measures)

There are a number of measures of inequality that satisfy all six criteria. Among the most widely used are the Theil indexes and the mean log deviation measure. Both belong to the family of generalized entropy (GE) inequality measures. The general formula is given by

$$GE(\alpha) = \frac{1}{\alpha(\alpha-1)} 1/N \sum_{i=1}^{N} (y_i/y^-)\,(\alpha - 1) \qquad (3)$$

Here y^- is the mean income per person (or expenditure per capita). The values of GE measures vary between zero and infinity, with zero representing an equal distribution and higher values representing higher levels of inequality. The parameter α in the GE class represents the weight given to distances between incomes at different parts of the income distribution, and can take any real value. For lower values of α, GE is more sensitive to changes in the lower tail of the distribution, and for higher values GE is more sensitive to changes that affect the upper tail. The most common values of α used are 0, 1, and 2. GE (1) is Theil's T index, which may be written

$$GE\ (1)\ =\ 1/N \sum_{i=1}^{N} \left(\frac{y_i}{y^-}\right) ln\ (y_i/y^-) \qquad (3.1)$$

GE (0), also known as Theil's L, and sometimes referred to as the mean log deviation measure, is given by:

$$GE\ (0) = \frac{1}{N \sum_{i=1}^{N} \ln\left(\frac{y_i}{y^-}\right)} \qquad (3.2)$$

Data Base

We focus on district level inequity for health care availability, utilisation and outcomes for four Indian states namely Madhya Pradesh, West Bengal, Punjab and Karnataka [33]. Based on their per capita average income compared to total Indian average,

both Madhya Pradesh and West Bengal belong to lower income states and other two states belong to higher income states [34]. We also compare change in district level inequity between two periods for West Bengal and Punjab. Data have been collected from various government publications. These include District Level Household and Facility Survey (DLHS-4), 2012-13: India. Madhya Pradesh (IIPS 2014), Estimates of State Domestic Product Madhya Pradesh; 2004-05 to 2012-13 (RBI, 2017), Annual Health Survey 2012-13 (GOI, 2014), Karnataka at Glance (Govt. of Karnataka, 2018), Punjab-At-A-Glance (District Wise), Publication No. 936 (Govt. of Punjab, 2012), Statistical Abstract West Bengal 2015(Govt. of West Bengal, 2017) and others [35-42].

Results

Madhya Pradesh

Results for four states using district level data are presented in Tables 1-7 (and Figures 2-5). Results for Madhya Pradesh presented in Table 1 depict a range of unequal distribution of different health care facilities. For instance minimum population covered by a sub-centre is 4136 in contrast to 10255 in maximum coverage (Table 1). Likewise difference between minimum and maximum per capita income (PCI) is nearly four times. Similar disparities could be observed in terms of population coverage by PHCs and CHCs. Except for ANMs, for most of other manpower like MHW, medical officer, lady medical officer, AYUSH doctors and Pharmacist, the percentage SHCs having these types of manpower is much higher for maximum value districts relative to their minimum value districts (Table 1, columns 3-10). This observation also holds for facilities like regular electricity and water supply (columns 12-13, Table 1), toilet facilities, labour room availability and usage and sub centres with govt. buildings (columns 14-17, Table 1). Such differentials in health inputs are also reflected in minimum and maximum IMR (37-85, column 18) in the districts of MP.

Keeping in mind these variations across districts, inequity coefficients, namely, Gini coefficient, Thiel's mean log deviations and Thiel's entropy measure (Thiel's T) are depicted in Figure 2. As calculated by us it was observed that lowest inequity coefficient remains for Auxiliary Nurse Midwife and very high inequity in terms of three inequity coefficients is for AYUSH doctors. Likewise in terms of facilities including regular water supply, electricity, availability and use of labour rooms and sub-centres within govt. buildings, the lowest and highest inequity pertains to toilet facilities and labour rooms used respectively (Figure 2).

Table 1: District Level Maximum and Minimum values relating to Health Facilities' average population coverage, percentage of health facilities having requisite medical manpower (or a particular facility) and Per Capita Income (PCI) in MP

Madhya Pradesh Total Districts 45	sub-Centre	Primary Health Centres	Community Health Centre	Auxiliary Nurse Midwife (%)	Male health Worker (%)	Additional ANM (%)	Medical officer (%)	Lady Medical Officer (%)	AYUSH Doctor (%)	Pharmacist (%)	Per capita Income at District level
minimum	4136	13538	47924	83.3	14.3	0	30	0	0	0	12892
maximum	10255	95591	229374	100	85.7	59.1	100	71.4	100	81.8	49327

Source: Estimated: ANM-Auxiliary Nurse Midwife, MHW= Male health Worker MOMP= Medical officer, LMOMP,=Lady Medical Officer, AYUSHMP =AYUSH Doctor.

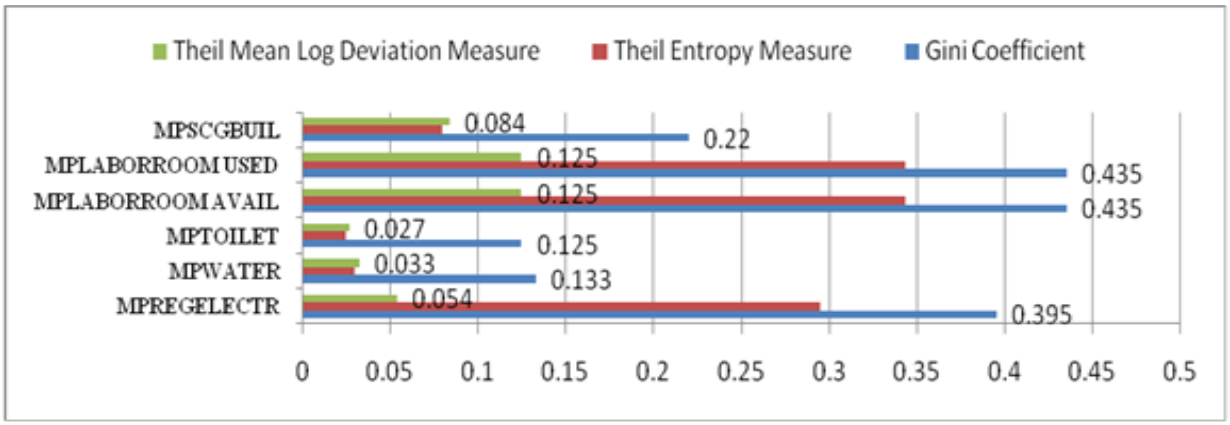

Figure 2: District Level Inequity coefficients relating to Health Facilities (in terms of Average Population Covered) in MP: Source: Estimated; Number of sub centres with regular electricity (mpregelectr), water supply(mpWater), toilet facilities(mptoilet), labour room (mplaborroom), labour room in current use(mplbinuse), sub centres with govt buildings(mpscgbuil)

However, as estimated by us, inequity coefficients at district level per capita income and infant mortality rates for MP seem to be quite low. Thus there does not seem to be any pattern that a low income State has higher inequality. To explore any possible correlation between some selected health care facility variables and per capita income (PCI), we looked into correlations among selected variables and PCI. The Pearson correlation between PCI and CHC population coverage is found to be positive and significant at 5 percent level. Also it is significant between percentages of Primary health centres having medical officer and PCI. Thus possibly the better off areas might have attracted more medical manpower's posting and presence. Yet health system of this low income states has been largely guided by requirements of the norm to be satisfied under three tier health systems existing in Indian set up.

Table 2: District Level Inequity coefficients relating to total infant mortality rate for MP

Inequality measures of total infant mortality rate at district level for MP	
Gini coefficient	0.076
Theil entropy measure	0.010
Theil mean log deviation measure	0.010

Source: Estimated.

Punjab

The maximum and minimum values for Punjab health care facilities are presented in Table 3 below. In case of Punjab the available information pertains to average population coverage in hospitals, Primary health centres, dispensaries and community health centres, Ayurvedic, Unani and Homeopathic institutions. Unlike other states the government publications provide us comparable data for two years namely 2001 and 2011. The comparison between two years facilitates inequity contrast after a decade. Indeed as seen in Table 3 below, maximum and minimum values gap has rather reduced for almost all the health facilities depicted here. This suggests that in some districts these health care facilities were not available in 2001(the minimum value being zero) but was established by year 2011. Also we observed that per capita income gap between maximum and minimum which was 1.86 times in 2004-05 has been reduced to 1.68 times in 2010-11.

Table 3: District Level Maximum and Minimum values relating to Health Facilities (in terms of Average Population Covered) in Punjab for 2001 and 2011

Punjab Health Facility(20 Districts)	Hospitals in 2001	Hospitals 2011	Primary health centers 2001	Primary health centers 2011	Dispensaries 2001	Dispensaries 2011	Community health centres 2001	Community health centres 2011
minimum	0	154502	0	36139	0	11815	0	124452
maximum	223714	992289	91904	105693	22954	26870	303283	622723

Source: Estimated

Further as depicted in Figure3, the inequity coefficients pertaining to hospitals, Primary health centres (PHCs), Dispensaries, community health centres (CHCs), ayurvedic, unani and homeopathic institutions have reduced in magnitude for all these facilities in Punjab between 2001 to 2011. For instance, Gini coefficient which was highest in 2001 for homeopathic institutions(.484) and Thiel's entropy measure which was highest for unani institutions (.501) came down to .336 and .443 respectively in 2011. Also by and large the patterns of all the three inequity coefficients remain in tune with each other. However among homeopathic and unani institutions the highest was different for Gini in 2011 which was unani institutions and it was unani institutions for Thiels entropy measure in both the periods. Also we observed that the inequity across per capita incomes in the districts of Punjab has come down and thus a similarity between downward movements of inequity values relating to health facilities and per capita incomes is observed for Punjab.

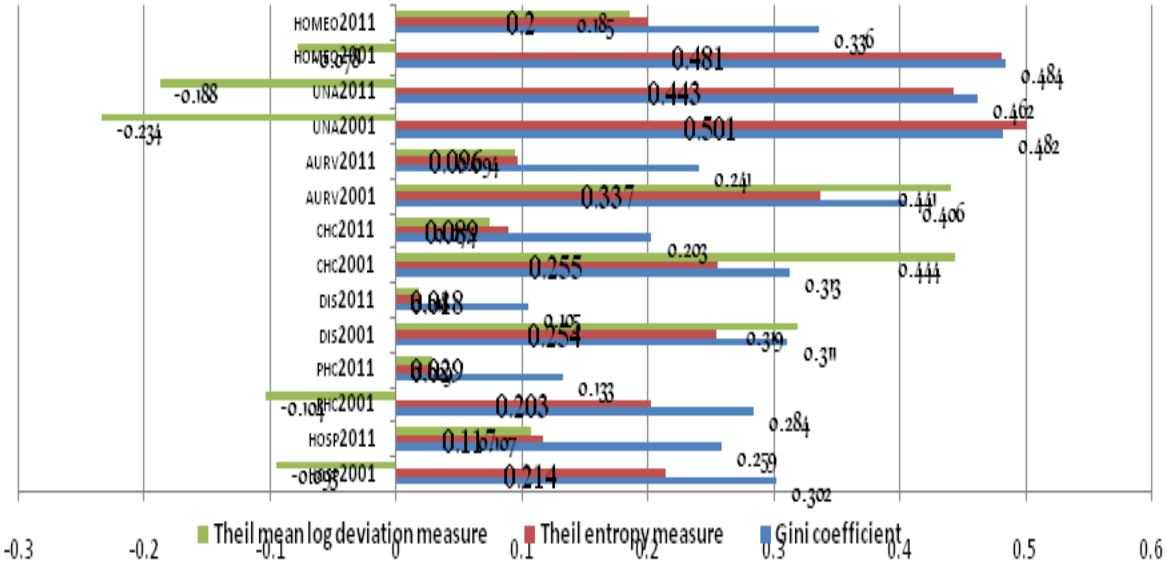

Figure 3: District Level Inequity Coefficients relating to Health Facilities (in terms of Average Population Covered) in Punjab for 2001 and 2011: *Source: Estimated; Hosp2001 and Hosp2011=Hospitals in 2001 and 2011, Phc2001 and Phc2011= Primary Health Centres in 2001 and 2011, Dis2001 and Dis2011= Govt. dispensaries in 2001 and 2011,Chc2001 and Chc2011= Community health centres in 2001 and 2011, Aurv2001 and Aurv2011=Ayurvedic Institutions in 2001 and 2011, Una2001 and Una2011=Unani Institutions in 2001 and 2011 Homeo2001 and Homeo2011=Homeopathic Institutions in 2001 and 2011.*

West Bengal

The results for another low income state namely West Bengal are presented below. As depicted in Table 4, there is one district (which is largely urban and it is the capital Kolkata) which is not having any sub centre and sub centre beds in both the years and thus the minimum population coverage is zero in these years. It should be noted that more population coverage actually denotes that a health facility is covering a more populated district and thus in year 2014 due to increase in number of health facilities we see a decline in total population coverage for all the health facilities depicted in Table 5. Also the difference in terms of gap between maximum and minimum which was highest for private hospitals (40.62 times in 2011) and the lowest (2.329 times in 2011) for total health units has not altered in 2014 thus indicating probably no change in inequity between the two years. This pattern of no change is in contrast to Punjab where a decline was indicated. However we also underline that the gap between contrasting years is only three years in West Bengal and in case of Punjab it is 7 years. Further the figures for minimum and maximum for per capita disposable income (in 2004-05 and 2011-12) and the population served per bed (in 2016) suggest that the gap between minimum and maximum income levels (less than three times in 2004-05) increased in 2011-12 to more than three times. Also as calculated by us, the population served per bed in 2016 in terms of maximum and minimum populations was nearly 18 times.

The inequity coefficients are presented for different health facilities variables and per capita incomes for the similar periods as discussed above. These indicate inequity increase for West Bengal (Figure 4). For instance Gini coefficient value which was the lowest for total health units (=.122) in the year 2011 went up to .141 (in 2014). Likewise the maximum Gini value which was .412 for private hospitals in 2011 increased to .438 (in 2014) (Figure 4). Even the per capita income has also shown an increase in inequality from 2004 to 2011-12 with the gini values as being .135 and .165 in the respective years. Keeping in view the highest level of inequity pertaining to private hospitals and hospital beds we also looked into Pearson's correlation coefficients across Per capita incomes and different health facilities. These indicated a very high positive and significant correlations between the government and private hospitals (as well as beds in them) and Per capita incomes. Probably part of increase in inequality in the latter period could also be attributed to these high correlations.

Table 4: District Level Maximum and Minimum values relating to Health Facilities (in terms of Average Population Covered) in West Bengal for 2011

Per Health Facility population covered WB 2011 (in numbers)

	Govt Hospitals	Govt Hospital beds	Private Hospitals	Private Hospitals beds	Health Centres	Health Centres beds	Sub-Centres	Total Health units	Beds in total Health units
Minimum	87716	275	12259	395	0	0	0	4652	162
Maximum	849040	4227	243997	16047	136255	9761	13589	10837	2450

Source: Estimated.

Table 5: District Level Maximum and Minimum values relating to Health Facilities (in terms of Average Population Covered) in West Bengal for 2014

per health facility population covered WB 2014 (in numbers)

Govt. Hospitals	Beds in Govt. Hospitals	Private Hospitals	Beds in Private Hospitals	Health Centres	Beds in Health centres	Sub centres	Total Health units	Beds in total Health units
87716	268	12259	395	0	0	0	4652	160
750212	4168	243997	16047	136255	9548	13589	10864	2422

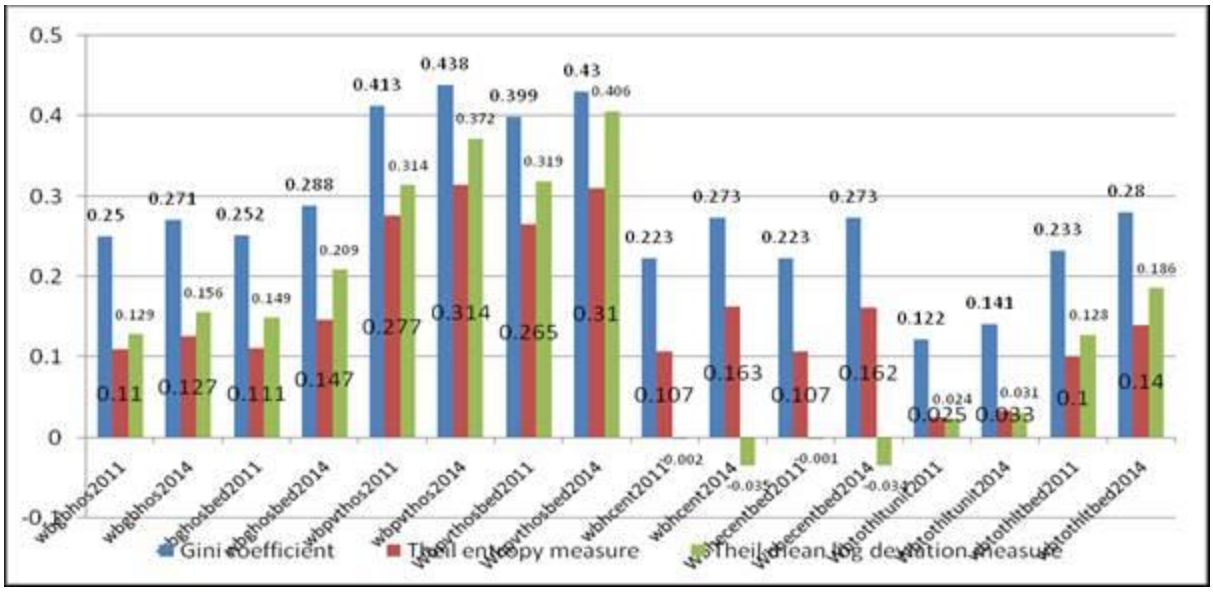

Figure 4: District Level Inequity coefficients relating to Health Facilities (in terms of Average Population Covered) in West Bengal for 2011 and 2014 in West Bengal: *Source: Estimated; wbgbhos=govt. hospitals in WB, wbghosbed=beds in govt. hospitals in WB, wbpvthos= private hospitals in WB, wbpvthosbed= beds in private hospitals in WB, wbhcen=health centres in WB, wbhecentbed= beds in health centres in WB, wbscent=sub centres in WB, wbtothltunit= total health units in WB, wbtothltbed= beds in total health units in WB, suffix 2011 and 2014 refers to values of these variables in the respective years.*

Karnataka

For Karnataka, the detailed information for 28 health related variables are presented below. Among others, these include the number of units and number of beds in various categories of hospitals covering: taluk, district, health and family welfare and teaching hospitals, PHCs, CHCs, government hospitals, private hospitals, nursing homes, allopathic, and ISM hospitals. Also details include variables relating to numbers of govt doctors and other facilities like blood banks and medical shops. Table 6 depicts the maximum and minimum values for these variables. We can observe from it that gap between maximum and minimum is lowest (2.208 times) for total health institutions and beds therein. The largest gap between minimum and maximum (22.319 times) pertains to beds in Taluka hospitals. Also as given in the same Table, the gap between maximum and minimum for total number of infant deaths is nearly 80 times.

Table 6: District Level Maximum and Minimum values relating to Health Facilities (in terms of Average Population Covered in numbers) in Karnataka for 2016

Karnataka Total Districts 30	Taluka Headquarter Hospitals	beds inTalukaHeadquarter Hospitals	District Hospitals	District Hospitals beds	Other Hospitals under Health and Family Welfare (HFW)	beds in Other Hospitals under HFW	teaching hospitals	beds in teaching hospitals	all hospitals	beds in all hospitals
minimum	143717	1437	0	0	0	0	0	0	50411	377
maximum	3207184	32072	2678980	12551	3001127	60023	4779661	6459	356354	2446

Karnataka Total Districts= 30	**Govt. hospitals**	Nursing homes	Total health institutions	Govt. Doctors	**beds Govt.** Hospitals	Med Shops	Blood Banks	Allopathy hospitals	Allopathy beds	Indian system medicines hospitals	Indian system medicines Beds
Min.	10635	11262	7967	6161	323	959	152723	11156	329	184840	10037
Max.	68238	115827	17594	29696	1553	5130	1703300	73447	1581	1044825	165154

The highest values of gini (.915) is for hfw beds and lowest (.237) is for PHC numbers. Other inequity coefficients namely Thiel's entropy and mean log deviations follow nearly the same order of values as that of Gini. This indicates that most other government established health facilities except HFW hospitals are more equitably distributed across the districts in Karnataka. Likewise the highest inequity as observed from Gini coefficients depicts more inequitable distribution of teaching hospitals since the coefficient for this category of health facilities (.624) is the highest.

The lowest inequity in this group (.165) is for beds in government hospitals which denotes a better health facility planning in the state. However, if we compare other kind of facilities like blood banks or medical shops, we find that the absolute values are not high, yet relative to medical shops; blood banks are less equitably distributed across the districts of the state. Further as usually distinguished, broadly two systems of medicines, namely allopathic and Indian systems of medicines, the latter is more inequitably distributed both in terms of numbers of hospitals (gini .266) and beds (gini .338). Even the inequity in numbers of private hospitals (.293) is also higher than in numbers of ISM hospitals (gini .266).

A similar lower value (.201) for gini coefficient is observed for distribution of government doctors in the districts. Thus keeping in view general lower values for government established institutions, we looked into inequity pertaining to Per capita income (for 2009-10) and a variable which was available from the published data as a broad indicator of health system output namely infant mortality at district level. Although the per capita income inequity is very low but infant deaths inequity seem to be quite high in terms of gini coefficient with other inequity coefficients nearing 0.50 magnitudes.

Further, with a presumption that per capita income may have a significant correlation mostly with private health facilities like nursing homes and private hospitals, we looked into Pearson's correlation coefficients among per capita incomes, public and private health facilities. However, as observed from our calculations, this correlation with per capita incomes was high and significant for public as well as private health facilities probably indicating an overall influence of the economic development of the state on health sector.

Discussion

While exploring inequity at district levels we had a presumption that there might be more inequality in low income state across its districts or it could be vice versa. However, an overview and analysis of our results indeed indicated an interesting inference that there does not seem to be any pattern that could lead us to believe that a low income State has higher inequality. No doubt the impact of economic development in high income state like Punjab is visible and the inequity across per capita incomes in the districts of Punjab has come down and thus a similarity between downward movements of inequity values relating to health facilities and per capita incomes is observed for Punjab. Despite it if we consider a shorter interval of time (only 3 years) for comparison as we did for a low income state of West Bengal, the change in per capita income did not seem to be at all visible. Yet it appears that private facilities seem to grow much in pace with time and relatively even within a span of three years there also exists a pattern of government health facilities which is impacted by the growth in private health facilities and depending upon demand factor it might influence public sector health equity either positively or otherwise. Nonetheless for any conclusive evidence, this co-movement of two sectors needs a separate longer period study.

Our results for inequity at district levels relating to health system variables, per capita incomes and a proxy for health system output covering two low income and two high income Indian states indicate that : i) it is not necessary that a low income state or high income state may have high intra state disparity either in health care facilities, health care output and per capita incomes; ii) comparing two periods for intra state inequity for a high income state like Punjab and low income state like West Bengal, we observed that in the high income state there is generally a decline in inequity. By contrast in low income state , between two periods with a shorter gap of three years, in general for health system variables the inequity seemed to be on rise; iii) despite being a high income state (like Karnataka) with low magnitudes of inequity for health system variables (in general) and per capita incomes, due to some other reasons a broad health system output indicator, infant deaths, could show a large magnitude of inequity; iv) the results across all the four states covered indicate that overall, three tiers of health facilities expansion by the central and state governments in India has led in general to more equitable public health facilities, yet private health facilities are less equitable and per capita incomes at

district levels seemed to have some influence for creating demand and thus establishment of private health facilities within the state; v) our results are more indicative rather than conclusive since we were restricted to correlations and not explored causation through more elaborate models.

ANNEXURE

Table A1: Per Capita Incomes of Indian States

S. No.	State / Union territory	GRDP per capita(nominal)	Data-year
1	Andaman and Nicobar Islands	₹121,954 (US$1,800)	2014–15
2	Andhra Pradesh	₹142,054 (US$2,100)	2017–18
3	Arunachal Pradesh	₹113,645 (US$1,700)	2015–16
4	Assam	₹60,952 (US$910)	2015–16
5	Bihar	₹34,168 (US$510)	2015–16
6	Chandigarh	₹242,386 (US$3,600)	2015–16
7	Chhattisgarh	₹91,772 (US$1,400)	2016–17
8	Delhi	₹303,073 (US$4,500)	2016–17
9	Goa	₹270,150 (US$4,000)	2015–16
10	Gujarat	₹138,023 (US$2,100)	2015–16
11	Haryana	₹180,174 (US$2,700)	2016–17
12	Himachal Pradesh	₹158,462 (US$2,400)	2017–18
13	Jammu and Kashmir	₹72,958 (US$1,100)	2015–16
14	Jharkhand	₹62,816 (US$940)	2015–16
15	Karnataka	₹146,416 (US$2,200)	2015–16
16	Kerala	₹155,516 (US$2,300)	2015–16
17	Madhya Pradesh	₹72,599 (US$1,100)	2016–17
18	Maharashtra	₹134,081 (US$2,000)	2014–15
19	Manipur	₹52,436 (US$780)	2014–15
20	Meghalaya	₹79,332 (US$1,200)	2016–17
21	Mizoram	₹85,659 (US$1,300)	2014–15
22	Nagaland	₹78,526 (US$1,200)	2014–15
23	Odisha	₹75,223 (US$1,100)	2016–17
24	Puducherry	₹190,384 (US$2,800)	2016–17
25	Punjab	₹114,561 (US$1,700)	2014–15
26	Rajasthan	₹76,881 (US$1,100)	2014–15
27	Sikkim	₹227,465 (US$3,400)	2015–16
28	Tamil Nadu	₹157,116 (US$2,300)	2016–17
29	Telangana	₹175,534 (US$2,600)	2017–18
30	Tripura	₹71,666 (US$1,100)	2014–15
31	Uttar Pradesh	₹48,520 (US$720)	2015–16
32	Uttarakhand	₹151,219 (US$2,300)	2015–16
33	West Bengal	₹78,903 (US$1,200)	2014–15
	India	₹112,764 (US$1,700)	2017–18

Source: Reserve Bank of India (2017); *State Wise Data*", *rbi.org.in*, New Delhi, pp 29-33.

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